Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

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[0093517]

12-AMRC-0039

DEC 22 2011

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Ms. Hedges:

TRANSMITTAL OF WASTE SITE RECLASSIFICATION FORMS AND SUPPORTING DOCUMENTATION FOR THE 128-H-1, 100-H BURNING PIT AND THE 116-H-5, 1904-H OUTFALL STRUCTURE WASTE SITES FOR THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY) APPROVAL

Attached for your approval are the subject Waste Site Reclassification Forms (WSRF) and their verification packages (Rev. 0) demonstrating these two waste sites have been remediated to meet the cleanup objectives of the interim action Record of Decision, as implemented through the approved Remedial Design Report/Remedial Action Work Plan (RDR/RAWP, DOE/RL-96-17). The U.S. Department of Energy Richland Operations Office (RL) has updated the supporting documents to incorporate those of Ecology's comments which have been resolved.

These two waste sites have been excavated to groundwater. Informational samples taken at 128-H-1 sediments in the groundwater depict Contaminant of Concern (COC) concentrations above soil cleanup levels; however, analysis of water samples taken found these COCs at less than Maximum Contaminant Levels (MCL). We conclude that these COCs are not leaching into the Columbia River. A review of groundwater monitoring data also found no COC above MCLs. For 116-H-5, a site specific evaluation utilizing the U.S. Environmental Protection Agency's soil screening equation for COC migration to groundwater demonstrates the protectiveness of the low residual contaminant concentrations. RL concludes that the supporting documentation demonstrates that the residual contaminant concentrations are protective of the groundwater and the Columbia River as modeled in accordance with the requirements of the approved RDR/RAWP and that additional remediation is unwarranted.

RECEIVED
DEC 29 2011
EDMC

If you have questions, please contact me or your staff may contact Joanne Chance, of my staff, at (509) 376-0811.

Sincerely,

Mark S French

Mark S. French, Federal Project Director
for the River Corridor Closure Project

AMRC:JCC

Attachments

cc w/attachs:
N. M. Menard, Ecology
Administrative Record, H6-08

cc w/o attach:
D. A. Faulk, EPA
D. L. Plung, WCH
M. L. Proctor, WCH

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0178

Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculation

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 49 Attm. 1 = 45 Attm. 2 = 1 Total = 97	T. E. Queen	J. D. Skoglie	B. L. Vedder	D. F. Obenauer	Signed 7/26/11
1	Cover = 1 Sheets = 49 Attm. 1 = 45 Attm. 2 = 1 Total = 97	J. D. Skoglie	T. E. Queen TE Queen	NA	D. F. Obenauer D. F. Obenauer	9/14/11

SUMMARY OF REVISION

1	Attachment 1, sheet 10; The results column for TPH-diesel range was widened so all numbers are legible.

Summary

Purpose:

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) Model Toxics Control Act (MTCA) 3-part test for nonradionuclide analytes and calculate the relative percent difference (RPD) for primary-duplicate sample pairs for each contaminant of concern (COC) and contaminant of potential concern (COPC), as necessary.

Table of Contents:

Given/References:

1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2009b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets),* Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
10) EPA, 1989, Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A; Interim Final, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D.C.
11) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Administrative Code.*

Solution:

Calculation methodology is described in Ecology Pub. #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2009b). Use data from attached worksheets to perform the 95% UCL calculation for each analyte, the WAC 173-340-740(7)(e) 3-part test for nonradionuclides, and the RPD calculations for each COC/COPC. The hazard quotient and carcinogenic risk calculations are located in a separate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:

The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 128-H-1 waste site. The data were entered into an EXCEL 2003 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with the RDR/RAWP (DOE-RL 2009b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:

The 128-H-1 waste site underwent statistical sampling at six decision units for verification sampling. Information on the re-samples taken at these locations are available in the RSVP.

Analytical results for all sampling locations are summarized in the tables provided on sheets 3, 4, and 5. Further information of the sample data quality is presented in the data quality assessment section of the associated RSVP.

Summary (continued)

Methodology, continued:

For nonradioactive analytes with ≤50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup is the 95% UCL. For nonradioactive analytes with >50% of the data below detection limits, as determined by direct inspection of the sample results (Attachment 1), the maximum detected value for the data set (which includes primary and duplicate samples) is used instead of the 95% UCL, and no further calculations are performed for those data sets. For convenience, these maximum detected values are included in the summary tables that follow. The 95% UCL was not calculated for data sets with no reported detections. Calculated cleanup levels are not available in Ecology (2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs/COPCs and are also not included in these calculations. The 95% UCL values were not calculated for potassium-40, radium-226, radium-228, thorium-228, and thorium-232 based on natural occurence at the Hanford Site.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above. For radionuclide data, calculation of the statistics is done using the reported value. In cases where the laboratory does not report a value below the minimum detectable activity (MDA), half of the MDA is used in the calculation. For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above.

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets (n < 10), the calculations are performed assuming nonparametric distribution, so no tests for distribution are performed. For nonradionuclide data sets of ten or greater, as for the subject site, distributional testing is done using Ecology's MTCAStat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2009b) and MTCAStat coding and due to a limitation in the MTCAStat coding (no direct capability to address variable quantitation limits within a data set), substitutions for censored data are performed before software input and the resulting data set treated as uncensored.

The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:
1) the 95% UCL exceeds the most stringent cleanup limit for each COPC/COC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC/COC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC/COC.

The RPD is calculated when both the primary value and either the duplicate or split value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed in Table 2-1 of the SAP (DOE-RL 2009a) for certain constituents. All other constituents will have their own pre-determined TDL's based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

$$RPD = [\,|M-S|/((M+S)/2)]*100$$

where, M = Main Sample Value S = Split (or duplicate) Sample Value

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. If the RPD is greater than 30%, further investigation regarding the usability of the data is performed. To assist in the identification of anomalous sample pairs, when an analyte is detected in the primary or duplicate/split sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate/split result exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the six decision units, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Areas A, B, and C

Analyte	A		B		C		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Antimony						0.239	mg/kg
Arsenic	45.0		65.3		11.7		mg/kg
Barium	84.7		88.2		106		mg/kg
Beryllium	0.277		0.339		0.297		mg/kg
Boron	2.83		3.25		5.07		mg/kg
Cadmium	0.179		0.151		0.153		mg/kg
Chromium	13.1		15.1		13.6		mg/kg
Cobalt	6.55		6.81		6.76		mg/kg
Copper	13.4		13.2		13.9		mg/kg
Hexavalent chromium					0.16		mg/kg
Lead	304		207		93.3		mg/kg
Manganese	314		340		299		mg/kg
Mercury		0.020		0.082		0.030	mg/kg
Molybdenum	0.392		0.272		0.350		mg/kg
Nickel	11.0		12.0		12.8		mg/kg
Vanadium	47.2		46.7		46.3		mg/kg
Zinc	49.5		43.4		43.9		mg/kg
TPH - diesel range		8400				9300	ug/kg
TPH - motor oil	42894		21073		25289		ug/kg
TPH - diesel range EXT		24000					ug/kg
Acenaphthene		10.9	44.3			68.2	ug/kg
Acenapthylene		3.65		1.58		55.4	ug/kg
Anthracene	2.97			2.83		3.54	ug/kg
Benzo(a)anthracene	55.3		18.1		38.7		ug/kg
Benzo(a)pyrene	56.3		27.4		49.1		ug/kg
Benzo(b)fluoranthene	38.1		22.6		52.4		ug/kg
Benzo(ghi)perylene	37.1		20.5		42.1		ug/kg
Benzo(k)fluoranthene	19.0		8.24		23.5		ug/kg
Chrysene	65.2		17.7		35.0		ug/kg
Dibenz(a,h)anthracene	6.28		2.55			18.6	ug/kg
Fluoranthene	96.0		79.4		561		ug/kg
Fluorene		2.87		11.8		4.30	ug/kg
Indeno(1,2,3-cd)pyrene	37.8		22.2		34.3		ug/kg
Naphthalene		5.48					ug/kg
Phenanthrene	59.8		24.2		17.5		ug/kg
Pyrene	187		72.9		84.0		ug/kg
Endosulfan I		1.29					ug/kg
4,4'-DDE		0.29				2.90	ug/kg
Aroclor-1254		8.05		8.75			ug/kg
Aroclor-1260				3.73		3.40	ug/kg
bis(2-ethylhexyl)phthalate		144					ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	A		B		C	
Cleanup Limit?	YES	NO	YES	NO	YES	NO
> 10% above Cleanup Limit?	YES	NO	YES	NO	YES	NO
Any sample > 2x Cleanup Limit?	YES	NO	YES	NO	YES	NO

[a]The 95% UCL result or maximum value, depending on data censorship.

-- = not applicable
B = blank contamination (inorganic constituents)
C = Sample was ≤5X the blank concentration
CVP = closeout verification package
D = dilution
DE = direct exposure
GW = groundwater
J = estimate
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
RAG = remedial action goal
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
SAP = sampling and analysis plan
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = Washington Administrative Code

Summary (continued)

Results:

The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the six decision units, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Areas D, E, and F

Analyte	D		E		F		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Arsenic	5.18		4.0		3.7		mg/kg
Barium	97.1		67.1		90.6		mg/kg
Beryllium	0.312			0.17	0.27		mg/kg
Boron	4.63		1.3		1.7		mg/kg
Cadmium	0.161		0.082		0.092		mg/kg
Chromium	14.4		12.7		14.1		mg/kg
Cobalt	6.79		6.5		7.3		mg/kg
Copper	13.8		16.7		14.9		mg/kg
Hexavalent chromium	0.15			0.917		0.265	mg/kg
Lead	27.6		6.9		5.8		mg/kg
Manganese	321		271		336		mg/kg
Mercury	0.25		0.013			0.0094	mg/kg
Molybdenum	0.42			0.49			mg/kg
Nickel	11.6		11.5		13.4		mg/kg
Vanadium	51.5		40.8		40.7		mg/kg
Zinc	40.7		36.2		41.0		mg/kg
TPH - diesel range		28800		160000	7451		ug/kg
TPH - motor oil	22992		85416		11223		ug/kg
Acenaphthene	12.7						ug/kg
Acenapthylene		66.2					ug/kg
Anthracene		1.31					ug/kg
Benzo(a)anthracene	9.16			12			ug/kg
Benzo(a)pyrene	8.77						ug/kg
Benzo(b)fluoranthene	9.91			13			ug/kg
Benzo(ghi)perylene	6.11						ug/kg
Benzo(k)fluoranthene	3.88						ug/kg
Chrysene		17.9		15			ug/kg
Dibenz(a,h)anthracene		2.59					ug/kg
Fluoranthene	26.8			23			ug/kg
Fluorene		4.27					ug/kg
Indeno(1,2,3-cd)pyrene	5.14						ug/kg
Naphthalene		6.57					ug/kg
Phenanthrene	10.2						ug/kg
Pyrene	17.1			30			ug/kg
4,4'-DDE		2.46					ug/kg
Aroclor-1254		9.43					ug/kg
Aroclor-1260		19.2					ug/kg
bis(2-ethylhexyl)phthalate			74.2		57		ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	D		E		F	
Cleanup Limit?	YES	YES	NO	NO	NO	NO
> 10% above Cleanup Limit?	YES	NO	NO	NO	NO	NO
Any sample > 2x Cleanup Limit?	YES	NO	NO	NO	NO	NO

[a]The 95% UCL result or maximum value, depending on data censorship.

Summary (continued)

Results:

The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the six decision units, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Relative Percent Difference Results and QA/QC Analysis[a]

Analyte	Duplicate Analysis					
	A	B	C	D	E	F
Aluminum	3.7%	1.8%	0.9%	1.6%	5.4%	1.0%
Arsenic		6.9%				
Barium	11.5%	4.6%	1.5%	2.4%	0.5%	4.4%
Calcium	0.6%	3.1%	1.5%	1.0%	1.2%	2.1%
Chromium	1.7%	2.1%	5.6%	1.3%	8.5%	4.0%
Copper	3.7%	6.0%	16.2%	0.7%	0.0%	3.9%
Iron	0.0%	1.0%	0.6%	0.9%	3.5%	1.0%
Lead	1.4%	51.1%				
Magnesium	2.0%	0.0%	0.5%	0.6%	2.8%	2.4%
Manganese	0.3%	2.6%	1.4%	1.3%	4.4%	0.3%
Potassium		3.4%		2.7%	2.5%	1.5%
Silicon	51.0%	6.4%	1.8%	5.5%	73.1%	9.2%
Sodium				3.7%		
Vanadium	4.5%	1.1%	0.9%	2.5%	5.7%	0.8%
Zinc	0.5%	3.7%	4.3%	3.2%	2.2%	1.2%
Dibenz(a,h)anthracene	13.8%					
Pyrene	2.9%					

[a]RPD listed where result produced, based on criteria. If RPD not required, no value is listed. The significance of the reported RPD values, including values greater than 30%, is addressed in the data quality assessment section of the RSVP.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 6 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data -Area A**

3	Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Cadmium			Chromium			Cobalt			Copper			Lead			Manganese		
4				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	A3	J1B856	6/30/10	46.1		0.835	75.3		0.42	0.262		0.167	2.71		1.67	0.088	B	0.21	12.2		0.84	5.83		2.51	13.1		1.67	139		0.84	302		0.835
6	Duplicate of J1B856	J1B866	6/30/10	46.6		0.784	84.5		0.39	0.276		0.157	2.85		1.57	0.086	B	0.20	12.0		0.78	6.11		2.35	13.6		1.57	137		0.78	301		0.784
7	A1	J1B854	6/30/10	15.1		0.874	70.0		0.44	0.219		0.175	1.96		1.75	0.187	B	0.22	10.8		0.87	6.37		2.62	13.1		1.75	73.6		0.87	301		0.874
8	A2	J1B855	6/30/10	23.5		0.844	79.5		0.42	0.302		0.169	2.37		1.69	0.122	B	0.21	14.6		0.84	6.69		2.53	13.8		1.69	84.2		0.84	329		0.844
9	A4	J1B857	6/30/10	56.8		0.820	81.6		0.41	0.276		0.164	3.2		1.64	0.148	B	0.21	13.0		0.82	6.16		2.46	12.6		1.64	406		0.82	331		0.82
10	A5	J1B858	6/30/10	31.8		0.870	69.0		0.44	0.271		0.174	2.53		1.74	0.113	B	0.22	12.7		0.87	6.14		2.61	12.3		1.74	164		0.87	304		0.87
11	A6	J1B859	6/30/10	42.4		0.855	77.8		0.43	0.275		0.171	2.79		1.71	0.179	B	0.21	13.1		0.86	5.95		2.56	12.7		1.71	278		0.86	300		0.855
12	A7	J1B860	6/30/10	29.7		0.845	79.1		0.42	0.241		0.169	3.17		1.69	0.177	B	0.21	11.6		0.85	5.47		2.54	12.8		1.69	319		0.85	289		0.845
13	A8	J1B861	6/30/10	33.8		0.839	83.7		0.42	0.253		0.168	2.58		1.68	0.091	B	0.21	12.7		0.84	5.92		2.52	12		1.68	98.0		0.84	291		0.839
14	A-9[a]	J1JVX2	6/16/11	40.5		0.35	80.1		0.07	0.21		0.031	2.80		0.91	0.29		0.038	12.4		0.054	6.60		0.09	14		0.2	348	X	0.15	311		0.15
15	A10	J1B863	6/30/10	47.6		0.949	85.5		0.47	0.321		0.190	2.66		1.90	0.116	B	0.24	13.7		0.95	6.75		2.85	13.7		1.9	224		0.95	326		0.949
16	A11	J1B864	6/30/10	16.5		0.678	72.1		0.34	0.200		0.136	2.11		1.36	0.121	B	0.17	10.2		0.68	6.84		2.04	13.8		1.36	88.3		0.68	282		0.678
17	A12	J1B865	6/30/10	17.3		0.822	105		0.41	0.184		0.164	1.93		1.64	0.114	B	0.21	12.6		0.82	6.80		2.47	13		1.64	86.0		0.82	302		0.822

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19 **Statistical Computation Input Data**

20	Sample Area	Sample Number	Sample Date	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
21				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
22	A3	J1B856/ J1B866	6/30/10	46.4	79.9	0.269	2.78	0.0870	12.1	5.97	13.4	138	302
23	A1	J1B854	6/30/10	15.1	70.0	0.219	1.96	0.187	10.8	6.37	13.1	73.6	301
24	A2	J1B855	6/30/10	23.5	79.5	0.302	2.37	0.122	14.6	6.69	13.8	84.2	329
25	A4	J1B857	6/30/10	56.8	81.6	0.276	3.20	0.148	13.0	6.16	12.6	406	331
26	A5	J1B858	6/30/10	31.8	69.0	0.271	2.53	0.113	12.7	6.14	12.3	164	304
27	A6	J1B859	6/30/10	42.4	77.8	0.275	2.79	0.179	13.1	5.95	12.7	278	300
28	A7	J1B860	6/30/10	29.7	79.1	0.241	3.17	0.177	11.6	5.47	12.8	319	289
29	A8	J1B861	6/30/10	33.8	83.7	0.253	2.58	0.0910	12.7	5.92	12.0	98.0	291
30	A-9[a]	J1JVX2	6/16/11	40.5	80.1	0.21	2.8	0.29	12.4	6.60	14.0	348	311
31	A10	J1B863	6/30/10	47.6	85.5	0.321	2.66	0.116	13.7	6.75	13.7	224	326
32	A11	J1B864	6/30/10	16.5	72.1	0.200	2.11	0.121	10.2	6.84	13.8	88.3	282
33	A12	J1B865	6/30/10	17.3	105	0.184	1.93	0.114	12.6	6.80	13.0	86.0	302

34 **Statistical Computations**

35		Arsenic		Barium		Beryllium		Boron		Cadmium		Chromium		Cobalt		Copper		Lead		Manganese	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
37	N	12		12		12		12		12		12		12		12		12		12	
38	% < Detection limit	0%		0%		0%		0%		0%		0%		0%		0%		0%		0%	
39	Mean	33.4		80.3		0.252		2.57		0.145		12.5		6.31		13.1		192		306	
40	Standard deviation	13.6		9.34		0.0419		0.421		0.057		1.19		0.437		0.64		119		15.9	
41	95% UCL on mean	45.0		84.7		0.277		2.83		0.179		13.1		6.55		13.4		304		314	
42	Maximum value	56.8		105		0.321		3.20		0.290		14.6		6.84		14.0		406		331	
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20	DE, GW & River Protection	200	GW Protection	1.51	GW & River Protection	320	GW Protection	0.81	GW & River Protection	18.5	GW & River Protection	15.7	GW Protection	22.0	River Protection	10.2	GW & River Protection	512	GW & River Protection
44	WAC 173-340 3-PART TEST																				
45	95% UCL > Cleanup Limit?	YES		NA		NA		NO		NA		NA		NA		NA		YES		NA	
46	> 10% above Cleanup Limit?	YES		NA		NA		NO		NA		NA		NA		NA		YES		NA	
47	Any sample > 2X Cleanup Limit?	YES		NA		NA		NO		NA		NA		NA		NA		YES		NA	
48	WAC 173-340 Compliance?	A detailed assessment will be performed. The data set does not meet the 3-part test criteria when compared to the direct exposure RAG.		Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.		A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.		Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	

Footnotes apply to all pages of this calculation.

[a] Sample A-9 was resampled due to a dieldrin exceedance.

[b] = Sample B-13 was mislabeled in the verification work instruction. There are a total of 12 samples for this decision unit.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 7 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data -Area A**

	Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
5	A3	J1B856	6/30/10	0.338	B	0.835	10.4		2.09	36.9		0.835	43.9		2.51
6	Duplicate of J1B856	J1B866	6/30/10	0.283	B	0.784	10.7		1.96	38.6		0.784	44.1		2.35
7	A1	J1B854	6/30/10	0.346	B	0.874	9.50		2.18	50		0.874	40.5		2.62
8	A2	J1B855	6/30/10	0.422	B	0.844	12.6		2.11	45.6		0.844	43.0		2.53
9	A4	J1B857	6/30/10	0.459	B	0.820	10.4		2.05	43.4		0.820	50.7		2.46
10	A5	J1B858	6/30/10	0.354	B	0.870	10.0		2.18	42.8		0.870	43.8		2.61
11	A6	J1B859	6/30/10	0.337	B	0.855	10.6		2.14	41.6		0.855	50.1		2.56
12	A7	J1B860	6/30/10	0.421	B	0.845	11.0		2.11	41.1		0.845	48.7		2.54
13	A8	J1B861	6/30/10	0.368	B	0.839	10.5		2.1	41.3		0.839	42.0		2.52
14	A-9[a]	J1JVX2	6/16/11	0.28	B	0.15	10.7		0.11	38.1		0.15	49.3	X	0.37
15	A10	J1B863	6/30/10	0.315	B	0.949	11.7		2.37	44.8		0.949	58.5		2.85
16	A11	J1B864	6/30/10	0.369	B	0.678	9.32		1.70	50.7		0.678	43.2		2.04
17	A12	J1B865	6/30/10	0.369	B	0.822	8.99		2.05	54.8		0.822	47.4		2.47

	Sample Area	TPH - motor oil ug/kg	Q	PQL	Anthracene ug/kg	Q	PQL	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL
5	A3	21100		10100	4.22		3.38	32.7		3.38	47.1		3.38	30.2		3.38
6	Duplicate of J1B856	31400		10000	3.51		3.34	32.4		3.34	75.7		3.34	43.8		3.34
7	A1	8010	J	9980	3.32	U	3.32	3.04	J	3.32	6.65		3.32	5.79		3.32
8	A2	24800		9850	3.28	U	3.28	4.51		3.28	8.07		3.28	6.02		3.28
9	A4	54300		9960	1.33	J	3.32	23.9		3.32	51.5		3.32	34.4		3.32
10	A5	12400		10100	1.18	J	3.37	15.3		3.37	55.0		3.37	40.3		3.37
11	A6	26900		9620	5.93		3.20	51.4		3.20	88.0		3.20	60.0		3.20
12	A7	70400		9900	3.63		3.30	39.0		3.30	63.9		3.30	46.8		3.30
13	A8	21400		9870	2.30	J	3.29	28.2		3.29	43.8		3.29	30.6		3.29
14	A-9[a]				2.80	U	2.80	31	X	2.9	58		5.9	34		3.9
15	A10	14100		10400	1.21	J	3.46	26.7		3.46	48.8		3.46	30.9		3.46
16	A11	13500		9640	3.21	U	3.21	9.00		3.21	17.0		3.21	15.3		3.21
17	A12	12400		9780	3.26	U	3.26	6.20		3.26	10.7		3.26	11.9		3.26

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19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	TPH - motor oil ug/kg	Anthracene ug/kg	Benzo(a)anthracene ug/kg	Benzo(a)pyrene ug/kg	Benzo(b)fluoranthene ug/kg
22	A3	J1B856/ J1B866	6/30/10	0.311	10.6	37.8	44.0	26250	3.87	32.6	61.4	37.0
23	A1	J1B854	6/30/10	0.346	9.50	50.0	40.5	8010	1.66	3.04	6.65	5.79
24	A2	J1B855	6/30/10	0.422	12.6	45.6	43.0	24800	1.64	4.51	8.07	6.02
25	A4	J1B857	6/30/10	0.459	10.4	43.4	50.7	54300	1.33	23.9	51.5	34.4
26	A5	J1B858	6/30/10	0.354	10.0	42.8	43.8	12400	1.18	15.3	55.0	40.3
27	A6	J1B859	6/30/10	0.337	10.6	41.6	50.1	26900	5.93	51.4	88.0	60.0
28	A7	J1B860	6/30/10	0.421	11.0	41.1	48.7	70400	3.63	39.0	63.9	46.8
29	A8	J1B861	6/30/10	0.368	10.5	41.3	42.0	21400	2.30	28.2	43.8	30.6
30	A-9[a]	J1JVX2	6/16/11	0.280	10.7	38.1	49.3		1.40	31	58	34
31	A10	J1B863	6/30/10	0.315	11.7	44.8	58.5	14100	1.21	26.7	48.8	30.9
32	A11	J1B864	6/30/10	0.369	9.32	50.7	43.2	13500	1.61	9.0	17.0	15.3
33	A12	J1B865	6/30/10	0.369	8.99	54.8	47.4	12400	1.63	6.2	10.7	11.9

34 **Statistical Computations**

		Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.
37	N	12	12	12	12	11	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	42%	0%	0%	0%
39	Mean	0.363	10.5	44.3	46.8	25860	2.28	22.6	42.7	29.4
40	Standard deviation	0.0515	1.00	5.19	5.0	19460	1.46	15.2	26.2	16.7
41	95% UCL on mean	0.392	11.0	47.2	49.5	42894	2.97	55.3	56.3	38.1
42	Maximum value	0.459	12.6	54.8	58.5	70400	5.93	51.4	88.0	60.0
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	240000 GW Protection	15 GW & River Protection	15 GW & River Protection	15 GW & River Protection
44	WAC 173-340 3-PART TEST									
45	95% UCL > Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 8 of 49

1 **128-H-1 Statistical Calculations**
2 **Verification Data -Area A**

	Sample	Sample	Sample	Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
3	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	A3	J1B856	6/30/10	26.6		3.38	14.9		3.38	31.9		3.38	5.19		3.38	99.3		3.38	16.9		3.38	50.0		3.38	96.4		3.38
6	Duplicate of J1B856	J1B866	6/30/10	44.3		3.34	21.0		3.34	32.0		3.34	7.67		3.34	114		3.34	46.4		3.34	34.8		3.34	99.2		3.34
7	A1	J1B854	6/30/10	4.84		3.32	2.56	J	3.32	1.96	J	3.32	3.32	U	3.32	3.32	U	3.32	2.93	J	3.32	3.16	J	3.32	8.01		3.32
8	A2	J1B855	6/30/10	5.76		3.28	2.84	J	3.28	4.04		3.28	1.07	J	3.28	3.28	U	3.28	5.17		3.28	2.79	J	3.28	9.80		3.28
9	A4	J1B857	6/30/10	39.7		3.32	15.1		3.32	18.1		3.32	6.87		3.32	65.7		3.32	45.9		3.32	15.6		3.32	66.0		3.32
10	A5	J1B858	6/30/10	51.9		3.37	16.5		3.37	12.8		3.37	7.13		3.37	40.1		3.37	48.1		3.37	12.0		3.37	40.5		3.37
11	A6	J1B859	6/30/10	51.0		3.2	29.9		3.20	46.3		3.20	9.75		3.20	179		3.20	56.4		3.20	50.7		3.20	184		3.20
12	A7	J1B860	6/30/10	37.7		3.3	21.9		3.30	37.2		3.30	7.10		3.30	157		3.30	40.4		3.30	57.1		3.30	141		3.30
13	A8	J1B861	6/30/10	26.3		3.29	15.0		3.29	26.2		3.29	4.31		3.29	99.7		3.29	25.5		3.29	32.2		3.29	92.5		3.29
14	A-9[a]	J1JVX2	6/16/11	38		6.6	25		3.6	36	J	4.5	10	U	10	34	JX	12	38		11	14	J	11	58		11
15	A10	J1B863	6/30/10	28.0		3.46	15.1		3.46	28.3		3.46	5.26		3.46	59.0		3.46	30.5		3.46	11.2		3.46	62.2		3.46
16	A11	J1B864	6/30/10	13.9		3.21	6.44		3.21	8.53		3.21	1.98	J	3.21	25.4		3.21	5.93		3.21	7.07		3.21	27.2		3.21
17	A12	J1B865	6/30/10	7.81		3.26	4.19		3.26	4.12		3.26	1.26	J	3.26	17.1		3.26	5.36		3.26	4.89		3.26	16.2		3.26

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19 **Statistical Computation Input Data**

20	Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene ug/kg	Benzo(k)fluoranthene ug/kg	Chrysene ug/kg	Dibenz(a,h)anthracene ug/kg	Fluoranthene ug/kg	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg
22	A3	J1B856/ J1B866	6/30/10	35.5	18.0	32.0	8.43	107	31.7	42.4	97.8
23	A1	J1B854	6/30/10	4.84	2.56	1.96	1.66	1.66	2.93	3.16	8.01
24	A2	J1B855	6/30/10	5.76	2.84	4.04	1.07	1.64	5.17	2.79	9.80
25	A4	J1B857	6/30/10	39.7	15.1	18.1	6.87	65.7	45.9	15.6	66.0
26	A5	J1B858	6/30/10	51.9	16.5	12.8	7.13	40.1	48.1	12.0	40.5
27	A6	J1B859	6/30/10	51.0	29.9	46.3	9.75	179	56.4	50.7	184
28	A7	J1B860	6/30/10	37.7	21.9	37.2	7.10	157	40.4	57.1	141
29	A8	J1B861	6/30/10	26.3	15.0	26.2	4.31	99.7	25.5	32.2	92.5
30	A-9[a]	J1JVX2	6/16/11	38	25	36	5.0	34	38	14	58
31	A10	J1B863	6/30/10	28.0	15.1	28.3	5.26	59.0	30.5	11.2	62.2
32	A11	J1B864	6/30/10	13.9	6.44	8.53	1.98	25.4	5.93	7.07	27.2
33	A12	J1B865	6/30/10	7.81	4.19	4.12	1.26	17.1	5.36	4.89	16.2

34 **Statistical Computations**

35		Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	17%	17%	0%	0%	0%
39	Mean	28.4	14.4	21.3	4.82	65.6	28.0	21.1	66.9
40	Standard deviation	16.9	8.89	15.1	2.81	58.7	19.0	19.4	54.3
41	95% UCL on mean	37.1	19.0	65.2	6.28	96.0	37.8	59.8	187
42	Maximum value	51.9	29.9	46.3	9.75	179	56.4	57.1	184
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	48000 GW & River Protection	15 GW & River Protection	100 GW & River Protection	30 GW & River Protection	18000 River Protection	330 GW & River Protection	240000 GW Protection	48000 GW Protection
44	**WAC 173-340 3-PART TEST**								
45	95% UCL > Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO	NO
46	> 10% above Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 9 of 49

128-H-1 Maximum Calculations
Verification Data -Area A

Sample Area	Sample Number	Sample Date	Mercury mg/kg	Q	PQL	TPH - diesel range ug/kg	Q	PQL	TPH - diesel range EXT ug/kg	Q	PQL	Acenaphthene ug/kg	Q	PQL
A3	J1B856	6/30/10	0.027	U	0.027	3380	U	3380				3.38	U	3.38
Duplicate of J1B856	J1B866	6/30/10	0.028	U	0.028	3340	U	3340				3.34	U	3.34
A1	J1B854	6/30/10	0.0090	B	0.020	3330	U	3330				1.81	J	3.32
A2	J1B855	6/30/10	0.029	U	0.029	3280	U	3280				3.28	U	3.28
A4	J1B857	6/30/10	0.025	U	0.025	3320	U	3320				3.32	U	3.32
A5	J1B858	6/30/10	0.026	U	0.026	3380	U	3380				0.844	J	3.37
A6	J1B859	6/30/10	0.025	U	0.025	3210	U	3210				3.37		3.20
A7	J1B860	6/30/10	0.023	U	0.023	3300	U	3300				2.81	J	3.30
A8	J1B861	6/30/10	0.025	U	0.025	3290	U	3290				3.29	U	3.29
A-9[a]	J1JVX2	6/16/11	0.020	M	0.0053	8400	N	880	24000	N	1000	9.2	U	9.2
A10	J1B863	6/30/10	0.025	U	0.025	3460	U	3460				10.9		3.46
A11	J1B864	6/30/10	0.020	B	0.030	3210	U	3210				3.21	U	3.21
A12	J1B865	6/30/10	0.027	U	0.027	3260	U	3260				3.26	U	3.26

Sample Area	Sample Number	Sample Date	Acenapthylene ug/kg	Q	PQL	Fluorene ug/kg	Q	PQL	Naphthalene ug/kg	Q	PQL	4,4'-DDE ug/kg	Q	PQL	Endosulfan I ug/kg	Q	PQL
A3	J1B856	6/30/10	3.38	U	3.38	2.87	J	3.38	3.38	U	3.38	1.26	UD	1.26	1.26	UD	1.26
Duplicate of J1B856	J1B866	6/30/10	3.34	U	3.34	2.51	J	3.34	3.34	U	3.34	1.31	UD	1.31	1.31	UD	1.31
A1	J1B854	6/30/10	3.32	U	3.32	3.32	U	3.32	3.32	U	3.32	1.34	UD	1.34	1.34	UD	1.34
A2	J1B855	6/30/10	3.28	U	3.28	3.28	U	3.28	3.28	U	3.28	1.36	UD	1.35	1.35	UD	1.36
A4	J1B857	6/30/10	3.65		3.32	1.49	J	3.32	5.48		3.32	1.29	UD	1.29	1.29	JD	1.29
A5	J1B858	6/30/10	2.53	J	3.37	3.37	U	3.37	3.56		3.37	1.27	UD	1.27	1.27	UD	1.27
A6	J1B859	6/30/10	3.20	U	3.20	2.73	J	3.20	3.20	U	3.20	1.32	UD	1.32	1.32	UD	1.32
A7	J1B860	6/30/10	3.30	U	3.30	1.82	J	3.30	3.30	U	3.30	1.37	UD	1.37	1.37	UD	1.37
A8	J1B861	6/30/10	3.29	U	3.29	1.20	J	3.29	3.29	U	3.29	1.32	UD	1.32	1.32	UD	1.32
A-9[a]	J1JVX2	6/16/11	8.3	U	8.3	4.9	U	4.9	11	U	11	0.29	JX	0.22	0.16	U	0.16
A10	J1B863	6/30/10	3.46	U	3.46	3.46	U	3.46	3.46	U	3.46	1.33	UD	1.33	1.33	UD	1.33
A11	J1B864	6/30/10	3.21	U	3.21	3.21	U	3.21	3.21	U	3.21	1.28	UD	1.28	1.28	UD	1.28
A12	J1B865	6/30/10	3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	1.33	UD	1.33	1.33	UD	1.33

Statistical Computations

	Mercury	TPH - diesel range	TPH - diesel range EXT	Acenaphthene	Acenapthylene	Fluorene	Naphthalene	4,4'-DDE	Endosulfan I
% < Detection limit	75%	92%	0%	58%	83%	58%	83%	92%	92%
Maximum value	0.020	8400	24000	10.9	3.65	2.87	5.48	0.29	1.29
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	0.33 GW & River Protection	200000 DE, GW, & River Protection	200000 DE, GW, & River Protection	96000 GW Protection	96000 GW Protection	64000 GW Protection	16000 GW Protection	3.3 River Protection	11.2 River Protection
3-PART TEST									
Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
3-Part Test Compliance?	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

128-H-1 Maximum Calculations
Verification Data -Area A

Sample Area	Sample Number	Sample Date	Aroclor-1254 ug/kg	Q	PQL	bis(2-ethylhexyl)phthalate ug/kg	Q	PQL
A3	J1B856	6/30/10	3.61	J	3.61	319	U	319
Duplicate of J1B856	J1B866	6/30/10	13.1	U	13.1	327	U	327
A1	J1B854	6/30/10	13.4	U	13.4	332	U	332
A2	J1B855	6/30/10	13.5	U	13.5	317	U	317
A4	J1B857	6/30/10	12.9	U	12.9	328	U	328
A5	J1B858	6/30/10	12.7	U	12.7	337	U	337
A6	J1B859	6/30/10	13.2	U	13.2	331	U	331
A7	J1B860	6/30/10	13.6	U	13.6	340	U	340
A8	J1B861	6/30/10	8.05	J	13.2	332	U	332
A-9[a]	J1JVX2	6/16/11	2.6	U	2.6	71	JB	44
A10	J1B863	6/30/10	13.3	U	13.3	144	J	340
A11	J1B864	6/30/10	12.7	U	12.7	324	U	324
A12	J1B865	6/30/10	13.3	U	13.3	329	U	329

Statistical Computations

	Aroclor-1254	bis(2-ethylhexyl)phthalate
% < Detection limit	83%	83%
Maximum value	8.05	144
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	17 GW & River Protection	360 River Protection
3-PART TEST		
Maximum > Cleanup Limit?	NO	NO
> 10% above Cleanup Limit?	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

Washington Closure Hanford

Originator T. E. Queen

Project 100-H Field Remediation

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

CALCULATION SHEET

Date 07/13/11

Job No. 14655

Calc. No. 0100H-CA-V0178

Checked J. D. Skoglie

Rev. No. 0

Date 07/13/11

Sheet No. 10 of 49

128-H-1 Statistical Calculations

Verification Data -Area B

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
B8	J1B887	6/29/10	71.1		0.744	84.1		0.37	0.332		0.149	3.04		1.49	0.13	B	0.19	14.0		0.74	6.75		2.23	11.3		1.49	124		0.74	342		0.744
Duplicate of J1B887	J1B892	6/29/10	76.2		0.762	88.1		0.38	0.338		0.152	3.21		1.52	0.124	B	0.19	14.3		0.76	6.58		2.29	12.0		1.52	209		0.76	351		0.762
B1	J1B880	6/29/10	39.5		0.836	73.9		0.42	0.281		0.167	2.11		1.67	0.196	B	0.21	14.4		0.84	6.04		2.51	10.2		1.67	98.3		0.84	303		0.836
B2	J1B881	6/29/10	43.8		0.801	75.7		0.40	0.307		0.160	2.17		1.60	0.112	B	0.20	13.5		0.80	6.22		2.4	10.7		1.60	43.6		0.80	315		0.80
B3	J1B882	6/29/10	45.1		0.711	80.2		0.36	0.334		0.142	2.06		1.42	0.085	B	0.18	14.7		0.71	6.7		2.13	13.1		1.42	24.0		0.71	324		0.711
B4	J1B883	6/29/10	39.1		0.904	80.4		0.45	0.324		0.181	2.01		1.81	0.123	B	0.23	14.5		0.90	6.68		2.71	12.2		1.81	48.3		0.90	335		0.90
B13[b]	J1B884	6/29/10	24.8		1.01	86.1		0.51	0.336		0.202	2.93		2.02	0.143	B	0.25	14.4		1.01	6.87		3.04	12.4		2.02	58.3		1.01	347		1.01
B6	J1B885	6/29/10	12.9		0.950	82.0		0.48	0.281		0.190	3.51		1.90	0.158	B	0.24	13.0		0.95	6.02		2.85	13.0		1.90	166		0.95	296		0.95
B7	J1B886	6/29/10	14.2		0.752	78.3		0.38	0.351		0.150	2.19		1.50	0.105	B	0.19	14.9		0.75	7.03		2.26	13.5		1.50	9.41		0.75	337		0.752
B9	J1B888	6/29/10	36.5		0.814	80.6		0.41	0.316		0.163	2.52		1.63	0.146	B	0.20	13.2		0.81	6.61		2.44	11.3		1.63	178		0.81	341		0.814
B10	J1B889	6/29/10	47.6		0.877	76.3		0.44	0.281		0.175	2.85		1.75	0.124	B	0.22	12.7		0.88	5.94		2.63	10.3		1.75	125		0.88	299		0.877
B11	J1B890	6/29/10	97.7		0.801	86.8		0.40	0.341		0.160	2.37		1.60	0.104	B	0.20	13.9		0.80	6.81		2.40	11.8		1.60	95.7		0.80	354		0.80
B12	J1B891	6/29/10	16.0		0.848	113		0.42	0.380		0.170	5.53		1.70	0.161	B	0.21	18.8		0.85	7.33		2.54	16.8		1.70	30.1		0.85	345		0.848

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
B8	J1B887/ J1B892	6/29/10	73.7	86.1	0.335	3.13	0.127	14.2	6.67	11.7	167	347
B1	J1B880	6/29/10	39.5	73.9	0.281	2.11	0.196	14.4	6.04	10.2	98.3	303
B2	J1B881	6/29/10	43.8	75.7	0.307	2.17	0.112	13.5	6.22	10.7	43.6	315
B3	J1B882	6/29/10	45.1	80.2	0.334	2.06	0.085	14.7	6.70	13.1	24.0	324
B4	J1B883	6/29/10	39.1	80.4	0.324	2.01	0.123	14.5	6.68	12.2	48.3	335
B13[b]	J1B884	6/29/10	24.8	86.1	0.336	2.93	0.143	14.4	6.87	12.4	58.3	347
B6	J1B885	6/29/10	12.9	82.0	0.281	3.51	0.158	13.0	6.02	13.0	166	296
B7	J1B886	6/29/10	14.2	78.3	0.351	2.19	0.105	14.9	7.03	13.5	9.41	337
B9	J1B888	6/29/10	36.5	80.6	0.316	2.52	0.146	13.2	6.61	11.3	178	341
B10	J1B889	6/29/10	47.6	76.3	0.281	2.85	0.124	12.7	5.94	10.3	125	299
B11	J1B890	6/29/10	97.7	86.8	0.341	2.37	0.104	13.9	6.81	11.8	95.7	354
B12	J1B891	6/29/10	16.0	113.0	0.380	5.53	0.161	18.8	7.33	16.8	30.1	345

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mean	40.9	83.3	0.322	2.78	0.132	14.3	6.58	12.2	86.9	329
Standard deviation	24.8	10.3	0.0307	0.989	0.0305	1.57	0.435	1.80	60.2	20.5
95% UCL on mean	65.3	88.2	0.339	3.25	0.151	15.1	6.81	13.2	207	340
Maximum value	97.7	113	0.380	5.53	0.196	18.8	7.33	16.8	209	354
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	YES	NA	NA	NO	NA	NO	NA	NA	YES	NA
> 10% above Cleanup Limit?	YES	NA	NA	NO	NA	NO	NA	NA	YES	NA
Any sample > 2X Cleanup Limit?	YES	NA	NA	NO	NA	NO	NA	NA	YES	NA
WAC 173-340 Compliance?	A detailed assessment will be performed. The data set does not meet the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford			
Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 11 of 49

128-H-1 Statistical Calculations

Verification Data -Area B

Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
B8	J1B887	6/29/10	0 217	B	0.744	11.1		1.86	44.4		0.744	41.9		2.23
Duplicate of J1B887	J1B892	6/29/10	0.233	B	0.762	11.1		1.91	44.9		0.762	43.5		2.29
B1	J1B880	6/29/10	0.232	B	0.836	10.5		2.09	46.5		0.836	45.8		2.51
B2	J1B881	6/29/10	0.269	B	0.801	11.1		2.00	42.8		0.801	38.6		2.40
B3	J1B882	6/29/10	0.216	B	0.711	12.1		1.78	44.9		0.711	37.7		2.13
B4	J1B883	6/29/10	0.224	B	0.904	11.7		2.26	44.9		0.904	41.1		2.71
B13[b]	J1B884	6/29/10	0.330	B	1.01	11.8		2.53	47.8		1.01	42.4		3.04
B6	J1B885	6/29/10	0.230	B	0.950	10.6		2.37	46.8		0.95	42.2		2.85
B7	J1B886	6/29/10	0.233	B	0.752	12.9		1.88	46.9		0.752	39.3		2.26
B9	J1B888	6/29/10	0.228	B	0.814	11.1		2.04	44.0		0.814	41.8		2.44
B10	J1B889	6/29/10	0.207	B	0.877	10.4		2.19	42.4		0.877	39.2		2.63
B11	J1B890	6/29/10	0.220	B	0.801	11.0		2.00	44.5		0.801	44.5		2.40
B12	J1B891	6/29/10	0.369	B	0.848	14.0		2.12	50.2		0.848	47.0		2.54

Sample Area	TPH - motor oil ug/kg	Q	PQL	Acenapthene ug/kg	Q	PQL	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL
B8	9720	J	10300	1.38	J	3.44	10.9		3.44	12.9		3.44	10.5		3.44
Duplicate of J1B887	8470	J	10200	3.38	U	3.38	4.06		3.38	6.34		3.38	5.33		3.38
B1	57000		9940	3.32	U	3.32	2.87	J	3.32	3.83		3.32	5.05		3.32
B2	8480	J	10200	3.41	U	3.41	5.74		3.41	6.17		3.41	5.01		3.41
B3	6540	J	9890	3.36	U	3.36	3.52		3.36	2.86	J	3.36	2.27	J	3.36
B4	5880	J	10000	1.18	J	3.37	13.1		3.37	19.7		3.37	12.1		3.37
B13[b]	10700		10200	1.34	J	3.35	15.9		3.35	24.1		3.35	17.8		3.35
B6	8600	J	9760	35.0		3.35	19.2		3.35	24.5		3.35	20.4		3.35
B7	4230	J	10000	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30
B9	13600		9630	3.37	U	3.44	2.78	J	3.44	4.64		3.44	3.00	J	3.44
B10	13200		9990	178		3.33	14.8		3.33	18.7		3.33	15.3		3.33
B11	5890	J	9970	3.41	U	3.41	4.66		3.41	8.51		3.41	8.68		3.41
B12	26000		10500	15.8		3.51	14.4		3.61	17.2		3.51	22.1		3.61

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	TPH - motor oil ug/kg	Acenapthene ug/kg	Benzo(a)anthracene ug/kg	Benzo(a)pyrene ug/kg	Benzo(b)fluoranthene ug/kg
B8	J1B887/ J1B892	6/29/10	0.225	11.1	44.7	42.7	9095	1.54	7.48	9.62	7.92
B1	J1B880	6/29/10	0.232	10.5	46.5	45.8	57000	1.66	2.97	3.83	5.05
B2	J1B881	6/29/10	0.269	11.1	42.8	38.6	8480	1.71	5.74	6.17	5.01
B3	J1B882	6/29/10	0.216	12.1	44.9	37.7	6540	1.68	3.52	2.86	2.27
B4	J1B883	6/29/10	0.224	11.7	44.9	41.1	5880	1.18	13.1	19.7	12.1
B13[b]	J1B884	6/29/10	0.330	11.8	47.8	42.4	10700	1.34	15.9	24.1	17.8
B6	J1B885	6/29/10	0.230	10.6	46.8	42.2	8600	35.0	19.2	24.5	20.4
B7	J1B886	6/29/10	0.233	12.9	46.9	39.3	4230	1.65	1.65	1.65	1.65
B9	J1B888	6/29/10	0.228	11.1	44.0	41.8	13600	1.72	2.78	4.64	3.00
B10	J1B889	6/29/10	0.207	10.4	42.4	39.2	13200	178	14.8	18.7	15.3
B11	J1B890	6/20/10	0.220	11.0	44.5	44.5	5890	1.71	4.66	8.51	8.68
B12	J1B891	6/29/10	0.369	14.0	50.2	47.0	26000	15.8	14.4	17.2	22.1

Statistical Computations

	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Acenapthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	50%	8%	8%	8%
Mean	0.249	11.5	45.5	41.9	14101	20.2	8.85	11.8	10.1
Standard deviation	0.0501	1.06	2.21	2.89	14682	50.7	6.19	8.51	7.27
95% UCL on mean	0.272	12.0	46.7	43.4	21073	44.3	18.1	27.4	22.6
Maximum value	0.369	14.0	50.2	47.0	57000	178	19.2	24.5	22.1
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	96000 GW Protection	15 GW & River Protection	15 GW & River Protection	15 GW & River Protection
WAC 173-340 3-PART TEST									
95% UCL > Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
> 10% above Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
Any sample > 2X Cleanup Limit?	NO	NA	NA	NA	NO	NO	NO	NO	NO
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 12 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data -Area B**

	Sample	Sample	Sample	Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	B8	J1B887	6/29/10	9.60		3.44	4.85		3.44	9.67		3.44	1.62	J	3.44	35.6		3.44	10.1		3.44	10.7		3.44	26.6		3.44
6	Duplicate of J1B887	J1B892	6/29/10	8.01		3.38	2.30	J	3.38	3.94		3.38	3.38	U	3.38	10.1		3.38	4.21		3.38	4.06		3.38	11.9		3.38
7	B1	J1B880	6/29/10	5.33		3.32	1.79	J	3.32	1.94	J	3.32	1.06	J	3.32	9.63		3.32	2.04	J	3.32	5.81		3.32	18.5		3.32
8	B2	J1B881	6/29/10	4.54		3.41	2.78	J	3.41	3.33	J	3.41	3.41	U	3.41	8.03		3.41	5.13		3.41	2.73	J	3.41	14.4		3.41
9	B3	J1B882	6/29/10	2.00	J	3.36	1.30	J	3.36	2.02	J	3.36	3.36	U	3.36	3.70		3.36	1.16	J	3.36	2.61	J	3.36	4.78		3.36
10	B4	J1B883	6/29/10	15.4		3.37	6.93		3.37	7.17		3.37	2.34	J	3.37	19.6		3.37	15.1		3.37	9.95		3.37	31.0		3.37
11	B13[b]	J1B884	6/29/10	18.2		3.35	8.72		3.35	7.31		3.35	3.30	J	3.35	30.1		3.35	20.7		3.35	8.48		3.35	33.6		3.35
12	B6	J1B885	6/29/10	20.8		3.35	9.91		3.35	9.79		3.35	3.79	0	3.35	89.7		3.35	23.3		3.35	19.8		3.35	59.2		3.35
13	B7	J1B886	6/29/10	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.3	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30
14	B9	J1B888	6/29/10	4.32		3.44	1.87	J	3.44	0.861	J	3.44	3.37	U	3.44	6.1		3.44	3.21	J	3.44	3.54		3.44	5.65		3.44
15	B10	J1B889	6/29/10	13.1		3.33	7.03		3.33	22.0		3.33	1.97	J	3.33	37.0		3.33	9.68		3.33	44.5		3.33	40.7		3.33
16	B11	J1B890	6/29/10	12.6		3.41	3.00	J	3.41	1.94	J	3.41	1.02	J	3.41	11.4		3.41	8.84		3.41	4.69		3.41	10.7		3.41
17	B12	J1B891	6/29/10	9.70		3.51	7.17		3.51	16.2		3.51	2.18	J	3.51	43.4		3.51	5.60		3.51	16.2		3.51	40.5		3.51

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
21	Area	Number	Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	B8	J1B887/ J1B892	6/29/10	8.81	3.58	6.81	1.66	22.9	7.16	7.36	18.8
23	B1	J1B880	6/29/10	5.33	1.79	1.94	1.06	9.63	2.04	5.81	18.5
24	B2	J1B881	6/29/10	4.54	2.78	3.33	1.71	8.03	5.13	2.73	14.4
25	B3	J1B882	6/29/10	2.00	1.30	2.02	1.68	3.70	1.16	2.61	4.8
26	B4	J1B883	6/29/10	15.4	6.93	7.17	2.34	19.6	15.1	10.0	31.0
27	B13[b]	J1B884	6/29/10	18.2	8.72	7.31	3.30	30.1	20.7	8.48	33.6
28	B6	J1B885	6/29/10	20.8	9.91	9.79	3.79	89.7	23.3	19.8	59.2
29	B7	J1B886	6/29/10	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
30	B9	J1B888	6/29/10	4.32	1.87	0.861	1.72	6.08	3.21	3.54	5.65
31	B10	J1B889	6/29/10	13.1	7.03	22.0	1.97	37.0	9.68	44.5	40.7
32	B11	J1B890	6/29/10	12.6	3.00	1.94	1.02	11.4	8.84	4.69	10.7
33	B12	J1B891	6/29/10	9.70	7.17	16.2	2.18	43.4	5.60	16.2	40.5

34 **Statistical Computations**

35		Benzo(ghi)perylene		Benzo(k)fluoranthene		Chrysene		Dibenz(a,h)anthracene		Fluoranthene		Indeno(1,2,3-cd)pyrene		Phenanthrene		Pyrene	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
37	N	12		12		12		12		12		12		12		12	
38	% < Detection limit	8%		8%		8%		33%		8%		8%		8%		8%	
39	Mean	9.70		4.64		6.75		2.01		23.6		8.63		10.6		23.3	
40	Standard deviation	6.38		3.09		6.55		0.820		24.8		7.42		12.0		17.7	
41	95% UCL on mean	20.5		8.24		17.7		2.55		79.4		22.2		24.2		72.9	
42	Maximum value	20.8		9.91		22.0		3.79		89.7		23.3		44.5		59.2	
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	48000	GW & River Protection	15	GW & River Protection	100	GW & River Protection	30	GW & River Protection	18000	River Protection	330	GW & River Protection	240000	GW Protection	48000	GW Protection
44	WAC 173-340 3-PART TEST																
45	95% UCL > Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO		NO	
46	> 10% above Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO		NO	
47	Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO		NO	
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11

1 **128-H-1 Maximum Calculations**
2 **Verification Data -Area B**

3	Sample	Sample	Sample	Mercury			Acenapthylene			Anthracene			Fluorene			Aroclor-1254			Aroclor-1260		
4	Area	Number	Date	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	B8	J1B887	6/29/10	0.028	U	0.028	3.44	U	3.44	3.44	U	3.44	3.44	U	3.44	13.6	U	13.6	13.6	U	13.6
6	Duplicate of J1B887	J1B892	6/29/10	0.026	U	0.026	3.38	U	3.38	3.38	U	3.38	3.38	U	3.38	13.4	U	13.4	13.4	U	13.4
7	B1	J1B880	6/28/10	0.025	U	0.025	3.32	U	3.32	3.32	U	3.32	3.32	U	3.32	13.3	U	13.3	13.3	U	13.3
8	B2	J1B881	6/29/10	0.025	U	0.025	3.41	U	3.41	3.41	U	3.41	3.41	U	3.41	13.6	U	13.6	13.6	U	13.6
9	B3	J1B882	6/29/10	0.025	U	0.025	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	13.4	U	13.4	13.4	U	13.4
10	B4	J1B883	6/29/10	0.025	U	0.025	3.37	U	3.37	3.37	U	3.37	2.19	J	3.37	13.2	U	13.2	13.2	U	13.2
11	B13[b]	J1B884	6/29/10	0.027	U	0.027	3.35	U	3.35	1.26	J	3.35	3.35	U	3.35	13.7	U	13.7	13.7	U	13.7
12	B6	J1B885	6/29/10	0.028	U	0.028	3.35	U	3.35	1.01	J	3.35	3.35	U	3.35	13.2	U	13.2	13.2	U	13.2
13	B7	J1B886	6/29/10	0.009	B	0.020	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	13.3	U	13.3	13.3	U	13.3
14	B9	J1B888	6/29/10	0.023	U	0.023	3.37	U	3.44	3.37	U	3.44	3.37	U	3.44	13.6	U	13.6	13.6	U	13.6
15	B10	J1B889	6/29/10	0.023	U	0.023	3.33	U	3.33	2.83	J	3.33	11.8		3.33	8.75	J	13.2	13.2	U	13.2
16	B11	J1B890	6/28/10	0.026	U	0.026	3.41	U	3.41	3.41	U	3.41	3.41	U	3.41	13.6	U	13.6	13.6	U	13.6
17	B12	J1B891	6/29/10	0.082		0.030	1.58	J	3.51	1.76	J	3.51	3.51	U	3.51	14.2	U	14.2	3.73	J	14.2

18 **Statistical Computations**

19		Mercury		Acenapthylene		Anthracene		Fluorene		Aroclor-1254		Aroclor-1260	
20	% < Detection limit	83%		92%		67%		83%		92%		92%	
21	Maximum value	0.082		1.58		2.83		11.8		8.75		3.73	
22	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	0.33	GW & River Protection	96000	GW Protection	240000	GW Protection	64000	GW Protection	17	GW & River Protection	17	GW & River Protection
23	**3-PART TEST**												
24	Maximum > Cleanup Limit?	NA		NO		NO		NO		NO		NO	
25	> 10% above Cleanup Limit?	NA		NO		NO		NO		NO		NO	
26	Any sample > 2X Cleanup Limit?	NA		NO		NO		NO		NO		NO	
27	**3-Part Test Compliance?**	Because all values are below background (0.33 mg/kg) the 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

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CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0179
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 14 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area C**

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Beryllium mg/kg	Beryllium Q	Beryllium PQL	Boron mg/kg	Boron Q	Boron PQL	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL	Copper mg/kg	Copper Q	Copper PQL	Hexavalent chromium mg/kg	Hexavalent chromium Q	Hexavalent chromium PQL	Lead mg/kg	Lead Q	Lead PQL
5	C8	J1B8B0	6/29/10	6.90		0.680	83.9		0.340	0.254		0.136	3.15		1.36	0.118	B	0.170	12.8	J	0.680	6.06		2.03	14.0		1.36	0.14	B	0.20	16.3		0.678
6	Duplicate of J1B8B0	J1B8B5	6/29/10	7.00		0.688	85.2		0.340	0.250		0.138	2.55		1.38	0.129	B	0.170	12.1	J	0.690	6.06		2.06	11.9		1.38	0.18	B	0.20	17.5		0.688
7	C1	J1B893	6/17/10	3.92		0.711	126		0.360	0.270		0.142	8.00		1.42	0.187		0.180	11.6		0.710	6.06		2.13	14.4		1.42	0.18	B	0.21	21.2		0.711
8	C2	J1B894	6/17/10	4.01		0.751	114		0.380	0.282		0.150	7.13		1.50	0.159	B	0.190	12.4		0.750	6.13		2.26	12.8		1.50	0.16	B	0.20	18.8		0.751
9	C3	J1B895	6/17/10	3.41		0.644	89.2		0.320	0.299		0.129	2.31		1.29	0.101	B	0.160	12.6		0.640	6.89		1.93	13.1		1.29	0.11	B	0.20	4.99		0.644
10	C4	J1B896	6/17/10	3.19		0.823	102		0.410	0.309		0.165	2.83		1.65	0.130	B	0.210	13.6		0.820	7.65		2.47	15.0		1.65	0.14	B	0.20	4.78		0.823
11	C5	J1B897	6/17/10	3.65		0.894	97.9		0.450	0.318		0.179	2.72		1.79	0.131	B	0.220	12.3		0.890	7.10		2.68	13.3		1.79	0.19	B	0.21	5.69		0.894
12	C6	J1B8B1	6/17/10	4.38		0.837	97.3		0.420	0.306		0.167	3.76		1.67	0.148	B	0.210	12.4		0.840	7.21		2.51	13.3		1.67	0.11	B	0.22	13.1		0.837
13	C7	J1B899	6/29/10	2.50		0.774	50.9		0.390	0.213		0.155	1.69		1.55	0.123	B	0.190	12.9	J	0.770	5.87		2.32	15.5		1.55	0.18	B	0.20	5.07		0.774
14	C9	J1B898	6/29/10	9.36		0.762	90.0		0.380	0.289		0.152	3.47		1.52	0.130	B	0.190	14.3	J	0.760	6.38		2.29	13.8		1.52	0.16	B	0.20	37.9		0.762
15	C10	J1B8B2	6/29/10	18.6		0.657	102		0.330	0.292		0.131	5.28		1.31	0.191		0.160	15.8	J	0.660	5.17		1.97	11.9		1.31	0.11	B	0.20	198		0.657
16	C11	J1B8B3	6/29/10	11.2		0.753	72.2		0.380	0.247		0.151	2.02		1.51	0.111	B	0.190	12.6	J	0.750	5.09		2.26	8.93		1.51	0.20	U	0.20	32.0		0.753
17	C12	J1B8B4	6/29/10	15.6		0.765	77.5		0.380	0.296		0.153	2.31		1.53	0.105	B	0.190	13.4	J	0.770	6.17		2.29	12.2		1.53	0.20	U	0.20	43.6		0.765

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19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Hexavalent chromium mg/kg	Lead mg/kg
22	C8	J1B8B0/ J1B8B5	6/29/10	6.95	84.6	0.252	2.85	0.124	12.5	6.06	13.0	0.16	16.9
23	C1	J1B893	6/17/10	3.92	126	0.270	8.00	0.187	11.6	6.06	14.4	0.18	21.2
24	C2	J1B894	6/17/10	4.01	114	0.282	7.13	0.159	12.4	6.13	12.8	0.16	18.8
25	C3	J1B895	6/17/10	3.41	89.2	0.299	2.31	0.101	12.6	6.89	13.1	0.11	4.99
26	C4	J1B896	6/17/10	3.19	102	0.309	2.83	0.130	13.6	7.65	15.0	0.14	4.78
27	C5	J1B897	6/17/10	3.65	97.9	0.318	2.72	0.131	12.3	7.10	13.3	0.19	5.69
28	C6	J1B8B1	6/17/10	4.38	97.3	0.306	3.76	0.148	12.4	7.21	13.3	0.11	13.1
29	C7	J1B899	6/29/10	2.50	50.9	0.213	1.69	0.123	12.9	5.87	15.5	0.18	5.07
30	C9	J1B898	6/29/10	9.36	90.0	0.289	3.47	0.130	14.30	6.38	13.8	0.16	37.9
31	C10	J1B8B2	6/29/10	18.6	102	0.292	5.28	0.191	15.8	5.17	11.9	0.11	198.0
32	C11	J1B8B3	6/29/10	11.2	72.2	0.247	2.02	0.111	12.60	5.09	8.9	0.10	32.0
33	C12	J1B8B4	6/29/10	15.6	77.5	0.296	2.31	0.105	13.4	6.17	12.2	0.10	43.6

34 **Statistical Computations**

35		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Hexavalent chromium	Lead
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%
39	Mean	7.23	92.0	0.281	3.70	0.137	13.0	6.32	13.1	0.14	33.5
40	Standard deviation	5.35	19.7	0.0305	2.04	0.0294	1.12	0.782	1.69	0.034	53.5
41	95% UCL on mean	11.7	106	0.297	5.07	0.153	13.6	6.76	13.9	0.16	93.3
42	Maximum value	18.6	126	0.318	8.00	0.191	15.8	7.65	15.5	0.19	198
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	2 River Protection	10.2 GW & River Protection
44	**WAC 173-340 3-PART TEST**										
45	95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 15 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area C**

	Sample Area	Sample Number	Sample Date	Manganese mg/kg	Q	PQL	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	TPH - motor oil ug/kg	Q	PQL	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL
5	C8	J1B8B0	6/29/10	276		0.027	0.301	B	0.678	9.96	J	1.70	46.2	J	0.678	38.5		2.03	9130	J	9710	85.7	J	3.29	50.8	J	3.29	85.1	J	3.29
6	Duplicate of J1B8B0	J1B8B5	6/29/10	280		0.024	0.286	B	0.688	10.0	J	1.72	48.6	J	0.688	40.2		2.06	11600	J	9920	2.89	J	3.30	4.18	J	3.30	6.00	J	3.30
7	C1	J1B893	6/17/10	270		0.030	0.434	B	0.711	10.0		1.78	46.4		0.711	44.2		2.13	36400		10200	13.4		3.53	11.1		3.53	4.24		3.53
8	C2	J1B894	6/17/10	270		0.026	0.367	B	0.751	10.8		1.88	40.6		0.751	43.4		2.25	29500		10200	3.14	J	3.3	2.48	J	3.3	3.47		3.30
9	C3	J1B895	6/17/10	290		0.031	0.298	B	0.644	12.4		1.61	41.3		0.644	40.1		1.93	10200	U	10200	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34
10	C4	J1B896	6/17/10	320		0.026	0.325	B	0.823	14.3		2.06	49.6		0.823	44.9		2.47	10100	U	10100	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37
11	C5	J1B897	6/17/10	314		0.026	0.301	B	0.894	12.6		2.24	43.3		0.894	44.6		2.68	13400		10500	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36
12	C6	J1B8B1	6/17/10	326		0.032	0.346	B	0.837	11.5		2.09	47.7		0.837	47.3		2.51	4060	J	10700	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59
13	C7	J1B899	6/29/10	235		0.030	0.354	B	0.774	17.6	J	1.93	44.3	J	0.774	39.4		2.32	10000	UJ	10000	3.16	UJ	3.16	3.16	UJ	3.16	3.16	UJ	3.16
14	C9	J1B898	6/29/10	305		0.028	0.331	B	0.762	11.2	J	1.91	50.1	J	0.762	41.9		2.29	17200	J	9990	129	J	3.13	179	J	3.13	190	J	3.13
15	C10	J1B8B2	6/29/10	250		0.020	0.299	B	0.657	9.53	J	1.64	38.1	J	0.657	44.8		1.97	18500	J	9960	31.1	J	3.34	46.6	J	3.34	47.3	J	3.34
16	C11	J1B8B3	6/29/10	249		0.023	0.249	B	0.753	9.64	J	1.88	36.4	J	0.753	35.6		2.28	5430	J	10000	15.0	J	3.34	14.3	J	3.34	10.7	J	3.34
17	C12	J1B8B4	6/29/10	287		0.020	0.237	B	0.765	11.0	J	1.91	42.1	J	0.766	38.8		2.29	16000	J	9920	11.9	J	3.26	12.6	J	3.26	11.7	J	3.26

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19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Manganese mg/kg	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	TPH - motor oil ug/kg	Benzo(a)anthracene ug/kg	Benzo(a)pyrene ug/kg	Benzo(b)fluoranthene ug/kg
22	C8	J1B8B0/ J1B8B5	6/29/10	278	0.294	10.0	46.4	39.4	10365	44.3	27.5	45.1
23	C1	J1B893	6/17/10	270	0.434	10.0	46.4	44.2	36400	13.4	11.1	4.24
24	C2	J1B894	6/17/10	270	0.367	10.8	40.6	43.4	29500	3.14	2.48	3.47
25	C3	J1B895	6/17/10	290	0.298	12.4	41.3	40.1	5100	1.67	1.67	1.67
26	C4	J1B896	6/17/10	320	0.325	14.3	49.6	44.9	5050	1.69	1.69	1.69
27	C5	J1B897	6/17/10	314	0.301	12.6	43.3	44.6	13400	1.68	1.68	1.68
28	C6	J1B8B1	6/17/10	326	0.345	11.5	47.7	47.3	4060	1.80	1.80	1.80
29	C7	J1B899	6/29/10	235	0.354	17.6	44.3	39.4	5000	1.58	1.58	1.58
30	C9	J1B898	6/29/10	305	0.331	11.2	50.1	41.9	17200	129	179	190
31	C10	J1B8B2	6/29/10	250	0.299	9.53	38.1	44.8	18500	31.1	46.6	47.3
32	C11	J1B8B3	6/29/10	249	0.249	9.64	36.4	35.6	5430	15.0	14.3	10.7
33	C12	J1B8B4	6/29/10	287	0.237	11.0	42.1	38.8	16000	11.9	12.6	11.7

34 **Statistical Computations**

		Manganese	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	25%	42%	42%	42%
39	Mean	283	0.319	11.7	43.9	42.0	13834	21.4	25.2	26.7
40	Standard deviation	29.6	0.0531	2.32	4.36	3.39	10455	36.5	50.3	54.0
41	95% UCL on mean	299	0.350	12.8	46.3	43.9	25289	38.7	49.1	52.4
42	Maximum value	326	0.434	17.6	50.1	47.3	36400	129	179	190
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	512 GW & River Protection	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	15 GW & River Protection	15 GW & River Protection	15 GW & River Protection
44	**WAC 173-340 3-PART TEST**									
45	95% UCL > Cleanup Limit?	NA	NO	NA	NA	NA	NO	YES	YES	YES
46	> 10% above Cleanup Limit?	NA	NO	NA	NA	NA	NO	YES	YES	YES
47	Any sample > 2X Cleanup Limit?	NA	NO	NA	NA	NA	NO	YES	YES	YES
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11

1 **128-H-1 Statistical Calculations**
2 **Verification Data - Area C**

3	Sample	Sample	Sample	Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	C8	J1B8B0	6/29/10	26.6	J	3.29	26.2		3.29	105	J	3.29	261	J	3.29	22.5	J	3.29	50.3		3.29	181	J	3.29
6	Duplicate of J1B8B0	J1B8B5	6/29/10	3.27	J	3.30	1.87	J	3.30	3.28	J	3.30	8.59	J	3.30	1.39	J	3.30	4.46		3.30	5.95	J	3.30
7	C1	J1B893	6/17/10	90.1		3.53	6.89		3.53	19.4		3.53	11.0		3.53	9.19		3.53	26.5		3.53	35.5		3.53
8	C2	J1B894	6/17/10	1.82	J	3.30	1.65	J	3.30	22.7		3.30	14.7		3.30	7.44		3.30	9.26		3.30	6.12		3.30
9	C3	J1B895	6/17/10	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34
10	C4	J1B896	6/17/10	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37
11	C5	J1B897	6/17/10	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	2.19	J	2.19	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36
12	C6	J1B8B1	6/17/10	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59	11.0		3.59	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59
13	C7	J1B899	6/29/10	3.16	UJ	3.16	3.16	U	3.16	3.16	UJ	3.16	3.16	UJ	3.16	3.16	UJ	3.16	3.16	U	3.16	3.16	UJ	3.16
14	C9	J1B898	6/29/10	116	J	3.13	86.3		3.13	99.9	J	3.13	149	J	3.13	121	J	3.13	19.3		3.13	262	J	3.13
15	C10	J1B8B2	6/29/10	34.3	J	3.34	17.6		3.34	30.3	J	3.34	100	J	3.34	35.3	J	3.34	33.3		3.34	104	J	3.34
16	C11	J1B8B3	6/29/10	10.6	J	3.34	5.6		3.34	8.18	J	3.34	29.4	J	3.34	14.7	J	3.3	9.7		3.34	33.3	J	3.34
17	C12	J1B8B4	6/29/10	8.93	J	3.28	5.35		3.26	8.66	J	3.26	24.5	J	3.26	10.9	J	3.26	8.97		3.28	30.5	J	3.26

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
21	Area	Number	Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	C8	J1B8B0/ J1B8B5	6/29/10	14.9	14.0	54.1	135	11.9	27.4	93.5
23	C1	J1B893	6/17/10	90.1	6.89	19.4	11.0	9.18	26.5	35.5
24	C2	J1B894	6/17/10	1.82	1.65	22.7	14.7	7.44	9.26	6.12
25	C3	J1B895	6/17/10	1.67	1.67	1.67	1.67	1.67	1.67	1.67
26	C4	J1B896	6/17/10	1.69	1.69	1.69	1.69	1.69	1.69	1.69
27	C5	J1B897	6/17/10	1.68	1.68	1.68	2.19	1.68	1.68	1.68
28	C6	J1B8B1	6/17/10	1.80	1.80	1.80	11.0	1.80	1.80	1.80
29	C7	J1B899	6/29/10	1.58	1.58	1.58	1.58	1.58	1.58	1.58
30	C9	J1B898	6/29/10	116	86.3	99.9	149	121	19.3	262
31	C10	J1B8B2	6/29/10	34.3	17.6	30.3	100	35.3	33.3	104
32	C11	J1B8B3	6/29/10	10.6	5.55	8.18	29.4	14.7	9.70	33.3
33	C12	J1B8B4	6/29/10	8.93	5.35	8.66	24.5	10.9	8.97	30.5

34 **Statistical Computations**

35		Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12
38	% < Detection limit	42%	42%	42%	25%	42%	42%	42%
39	Mean	23.8	12.1	21.0	40.1	18.2	11.9	47.8
40	Standard deviation	38.6	23.9	29.5	54.8	33.7	11.7	76.4
41	95% UCL on mean	42.1	23.5	35.0	561	34.3	17.5	84.0
42	Maximum value	116	86.3	105	261	121	50.3	262
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	48000 GW & River Protection	15 GW & River Protection	100 GW & River Protection	18000 River Protection	330 GW & River Protection	240000 GW Protection	48000 GW Protection
44	**WAC 173-340 3-PART TEST**							
45	95% UCL > Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
46	> 10% above Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 17 of 49

1 **128-H-1 Maximum Calculations**
2 **Verification Data - Area C**

	Sample	Sample	Sample	Antimony			Mercury			TPH - diesel range			Acenapthene		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	C8	J1B8B0	6/29/10	0.239	JB	0.68	0.027	U	0.027	3240	U	3240	68.2		3.29
6	Duplicate of J1B8B0	J1B8B5	6/29/10	0.688	UJ	0.688	0.024	U	0.024	3310	U	3310	3.30	U	3.30
7	C1	J1B893	6/17/10	0.711	U	0.711	0.030	B	0.030	9300		3410	12.5		3.53
8	C2	J1B894	6/17/10	0.751	U	0.751	0.026	U	0.026	8630		3390	3.30	U	3.30
9	C3	J1B895	6/17/10	0.644	U	0.644	0.031	U	0.031	3390	U	3390	3.34	U	3.34
10	C4	J1B896	6/17/10	0.823	U	0.823	0.026	U	0.026	3370	U	3370	3.37	U	3.37
11	C5	J1B897	6/17/10	0.894	U	0.894	0.026	U	0.026	3500	U	3500	3.36	U	3.36
12	C6	J1B8B1	6/17/10	0.837	U	0.837	0.032	U	0.032	3570	U	3570	3.59	U	3.59
13	C7	J1B899	6/29/10	0.774	UJ	0.774	0.030	U	0.030	3340	U	3340	3.16	U	3.16
14	C9	J1B898	6/29/10	0.762	UJ	0.762	0.028	U	0.028	3330	U	3330	3.1	U	3.13
15	C10	J1B8B2	6/29/10	0.657	UJ	0.657	0.015	B	0.020	5320		3320	0.837	J	3.34
16	C11	J1B8B3	6/29/10	0.753	UJ	0.753	0.023	U	0.023	3340	U	3340	14.2		3.34
17	C12	J1B8B4	6/29/10	0.765	UJ	0.765	0.008	B	0.020	7630		3310	3.26	U	3.26

	Sample	Acenapthylene			Anthracene			Dibenz(a,h)anthracene			Fluorene			4,4'-DDE			Aroclor-1260		
4	Area	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	C8	3.29	U	3.29	3.54		3.29	5.20		3.29	3.29	U	3.29	1.29	UD	1.29	12.9	U	12.9
6	Duplicate of J1B8B0	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	1.34	UD	1.34	13.3	U	13.3
7	C1	3.53	U	3.53	1.59	J	3.53	3.53	U	3.53	3.53	U	3.53	1.41	UD	1.41	14.1	U	14.1
8	C2	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	4.30		3.30	1.30	UD	1.30	13.0	U	13.0
9	C3	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	1.30	UD	1.30	13.0	U	13.0
10	C4	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	1.36	UD	1.36	13.6	U	13.6
11	C5	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	3.36	U	3.38	1.39	UD	1.39	13.8	U	13.8
12	C6	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59	1.43	UD	1.43	14.3	U	14.3
13	C7	3.16	U	3.16	3.16	U	3.16	3.16	U	3.16	3.16	U	3.16	1.29	UD	1.29	12.9	U	12.9
14	C9	1.72	J	3.13	2.67	J	3.13	18.6		3.13	0.909	J	3.13	1.36	UD	1.36	13.6	U	13.6
15	C10	55.4		3.34	3.34	U	3.34	7.14		3.34	3.34	U	3.34	2.90	JD	2.90	3.40	J	13.4
16	C11	5.52		3.34	3.34	U	3.34	1.61	J	3.34	3.34	U	3.34	1.32	UD	1.32	13.2	U	13.2
17	C12	3.26	U	3.26	3.26	U	3.26	1.47	J	3.26	3.26	U	3.26	1.34	UD	1.34	13.4	U	13.4

18 **Statistical Computations**

19		Antimony	Mercury	TPH - diesel range	Acenapthene	Acenapthylene	Anthracene	Dibenz(a,h)anthracene	Fluorene	4,4'-DDE	Aroclor-1260
20	% < Detection limit	92%	75%	67%	67%	75%	75%	58%	83%	92%	92%
21	Maximum value	0.239	0.030	9300	68.2	55.4	3.54	18.6	4.30	2.90	3.40
22	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	5 GW & River Protection	0.33 GW & River Protection	200000 DE, GW, & River Protection	96000 GW Protection	96000 GW Protection	240000 GW Protection	30 GW & River Protection	64000 GW Protection	3.3 River Protection	17 GW & River Protection
23	**3-PART TEST**										
24	Maximum > Cleanup Limit?	NA	NA	NO	NO	NO	NO	NO	NO	NO	NO
25	> 10% above Cleanup Limit?	NA	NA	NO	NO	NO	NO	NO	NO	NO	NO
26	Any sample > 2X Cleanup Limit?	NA	NA	NO	NO	NO	NO	NO	NO	NO	NO
27	**3-Part Test Compliance?**	Because all values are below background (5 mg/kg) the 3-part test is not required.	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

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CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 18 of 49

1 128-H-1 Statistical Calculations

2 Verification Data - Area D

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL
5	D5	J1B8C0	6/29/10	3.31		0.793	98.6		0.400	0.385		0.159	2.26		1.59	0.137	B	0.200
6	Duplicate of J1B8C0	J1B8C8	6/29/10	3.29		0.749	101		0.370	0.396		0.150	2.20		1.60	0.130	B	0.190
7	D1	J1B8B6	6/29/10	3.46		0.743	98.7		0.370	0.338		0.149	3.53		1.49	0.129	B	0.190
8	D2	J1B8B7	6/29/10	3.14		0.990	105		0.500	0.240		0.198	7.11		1.98	0.191	B	0.250
9	D3	J1B8B8	6/29/10	3.31		0.677	91.4		0.340	0.301		0.135	3.26		1.35	0.108	B	0.170
10	D4	J1B8B9	6/29/10	2.75		0.881	71.4		0.440	0.263		0.176	2.21		1.76	0.153	B	0.220
11	D6	J1B8C1	6/29/10	2.96		0.798	76.5		0.400	0.211		0.160	3.42		1.60	0.144	B	0.200
12	D7	J1B8C2	6/29/10	2.78		0.680	85.7		0.340	0.279		0.136	1.99		1.36	0.129	B	0.170
13	D8	J1B8C3	6/29/10	2.28		0.680	58.1		0.340	0.205		0.136	1.61		1.36	0.123	B	0.170
14	D9	J1B8C4	6/29/10	3.57		0.806	85.1		0.400	0.328		0.161	1.91		1.61	0.146	B	0.200
15	D10	J1B8C5	6/29/10	6.68		0.822	107		0.410	0.272		0.164	6.91		1.64	0.227		0.210
16	D11	J1B8C6	6/29/10	10.7		0.635	97.2		0.320	0.290		0.127	4.12		1.27	0.140	B	0.160
17	D12	J1B8C7	6/29/10	3.80		0.757	61.4		0.380	0.245		0.151	1.91		1.51	0.119	B	0.190

	Sample Number	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Hexavalent chromium mg/kg	Q	PQL	Lead mg/kg	Q	PQL
5	J1B8C0	15.0	J	0.793	7.44		2.38	13.3		1.59	0.20	U	0.20	5.03		0.793
6	J1B8C8	15.2	J	0.749	7.67		2.25	13.4		1.60	0.11	B	0.22	5.09		0.749
7	J1B8B6	14.5	J	0.743	6.81		2.23	12.1		1.49	0.16	B	0.20	3.75		0.743
8	J1B8B7	11.3	J	0.990	5.14		2.97	12.6		1.98	0.21	U	0.21	19.9		0.990
9	J1B8B8	13.3	J	0.677	6.26		2.03	12.0		1.35	0.20	U	0.20	4.08		0.677
10	J1B8B9	14.6	J	0.881	7.05		2.64	13.6		1.76	0.21	U	0.21	6.90		0.881
11	J1B8C1	12.9	J	0.798	5.82		2.40	13.7		1.60	0.070	B	0.20	19.6		0.798
12	J1B8C2	12.2	J	0.680	7.10		2.04	12.3		1.36	0.14	B	0.20	4.90		0.680
13	J1B8C3	12.1	J	0.680	6.34		2.04	11.7		1.36	0.16	B	0.20	4.67		0.680
14	J1B8C4	13.4	J	0.806	6.59		2.42	10.9		1.61	0.18	B	0.21	5.13		0.806
15	J1B8C5	12.5	J	0.822	6.10		2.47	17.4		1.64	0.090	B	0.20	74.9		0.822
16	J1B8C6	16.4	J	0.636	6.13		1.90	13.8		1.27	0.12	B	0.20	44.4		0.635
17	J1B8C7	14.7	J	0.757	6.26		2.27	12.5		1.51	0.17	B	0.20	14.4		0.757

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19 Statistical Computation Input Data

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Hexavalent chromium mg/kg	Lead mg/kg
22	D5	J1B8C0/ J1B8C8	6/29/10	3.30	99.8	0.391	2.23	0.134	15.1	7.56	13.4	0.11	5.06
23	D1	J1B8B6	6/29/10	3.46	98.7	0.338	3.53	0.129	14.5	6.81	12.1	0.16	3.75
24	D2	J1B8B7	6/29/10	3.14	105	0.240	7.11	0.191	11.3	5.14	12.6	0.11	19.9
25	D3	J1B8B8	6/29/10	3.31	91.4	0.301	3.26	0.108	13.3	6.26	12.0	0.10	4.08
26	D4	J1B8B9	6/29/10	2.75	71.4	0.263	2.21	0.153	14.6	7.05	13.6	0.11	6.90
27	D6	J1B8C1	6/29/10	2.96	76.5	0.211	3.42	0.144	12.9	5.82	13.7	0.07	19.6
28	D7	J1B8C2	6/29/10	2.78	85.7	0.279	1.99	0.129	12.2	7.10	12.3	0.14	4.90
29	D8	J1B8C3	6/29/10	2.28	58.1	0.205	1.61	0.123	12.1	6.34	11.7	0.16	4.67
30	D9	J1B8C4	6/29/10	3.57	85.1	0.328	1.91	0.146	13.4	6.59	10.9	0.18	5.13
31	D10	J1B8C5	6/29/10	6.68	107	0.272	6.91	0.227	12.5	6.10	17.4	0.09	74.9
32	D11	J1B8C6	6/29/10	10.7	97.2	0.290	4.12	0.140	16.4	6.13	13.8	0.12	44.4
33	D12	J1B8C7	6/29/10	3.80	61.4	0.245	1.91	0.119	14.7	6.26	12.5	0.17	14.4

34 Statistical Computations

35		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Hexavalent chromium	Lead
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%
39	Mean	4.06	86.4	0.280	3.35	0.145	13.6	6.43	13.0	0.13	17.3
40	Standard deviation	2.36	16.5	0.0539	1.88	0.0332	1.49	0.64	1.65	0.035	21.6
41	95% UCL on mean	5.18	97.1	0.312	4.63	0.161	14.4	6.79	13.8	0.15	27.6
42	Maximum value	10.7	107	0.396	7.11	0.227	16.4	7.67	17.4	0.18	74.9
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	2 GW Protection	10.2 GW & River Protection
44	WAC 173-340 3-PART TEST										
45	95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen

Project 100-H Field Remediation

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11

Job No. 14655

Calc. No. 0100H-CA-V0178

Checked J. D. Skoglie

Rev. No. 0

Date 07/13/11

Sheet No. 19 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area D**

3	Sample	Sample	Sample	Manganese			Mercury			Molybdenum			Nickel			Vanadium			Zinc			TPH - motor oil			Acenapthene			Benzo(a)anthracene			Benzo(a)pyrene		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	D5	J1B8C0	6/29/10	369		0.793	0.029	U	0.029	0.352	B	0.793	13.0	J	1.98	47.8	J	0.793	42.5		2.38	9950	UJ	9950	3.36	U	3.36	3.36	UJ	3.36	3.36	UJ	3.36
6	Duplicate of J1B8C0	J1B8C8	6/29/10	374		0.749	0.032	U	0.032	0.302	B	0.749	13.3	J	1.87	49.0	J	0.749	43.9		2.25	10700	UJ	10700	3.48	U	3.48	3.48	UJ	3.48	3.48	UJ	3.48
7	D1	J1B8B6	6/29/10	326		0.743	0.027	U	0.027	0.288	B	0.743	11.8	J	1.86	41.7	J	0.743	42.6		2.23	9900	UJ	9900	3.28	U	3.28	3.28	UJ	3.28	3.28	UJ	3.28
8	D2	J1B8B7	6/29/10	222		0.990	1.07		0.030	0.315	B	0.990	9.91	J	2.48	39.4	J	0.990	38.7		2.97	29300	J	10000	19.4		3.38	22.6	J	3.38	11.0	J	3.38
9	D3	J1B8B8	6/29/10	284		0.677	0.026	U	0.026	0.242	B	0.677	11.2	J	1.69	39.8	J	0.677	37		2.03	6970	J	10000	3.31	U	3.31	1.84	J	3.31	3.31	UJ	3.31
10	D4	J1B8B9	6/29/10	310		0.881	0.020	B	0.030	0.524	B	0.881	11.5	J	2.20	58.4	J	0.881	40.7		2.64	4970	J	10400	3.58	U	3.58	3.58	UJ	3.58	3.58	UJ	3.58
11	D6	J1B8C1	6/29/10	267		0.798	0.036		0.030	0.389	B	0.798	11.1	J	2.00	48.4	J	0.798	36.9		2.40	3590	J	9800	2.31	J	3.30	2.59	J	3.30	3.52	J	3.30
12	D7	J1B8C2	6/29/10	333		0.680	0.024	U	0.024	0.327	B	0.680	10.0	J	1.70	52.5	J	0.680	39.5		2.04	4800	J	10100	9.82		3.38	3.38	UJ	3.38	3.38	UJ	3.38
13	D8	J1B8C3	6/29/10	282		0.680	0.010	B	0.030	0.427	B	0.680	10.5	J	1.70	58.2	J	0.680	36.3		2.04	6810	J	9950	3.35	U	3.35	3.35	UJ	3.35	3.35	UJ	3.35
14	D9	J1B8C4	6/29/10	343		0.806	0.030	U	0.030	0.329	B	0.806	11.2	J	2.01	43.0	J	0.806	39.9		2.42	10200	UJ	10200	3.44	U	3.44	6.21	J	3.44	7.91	J	3.44
15	D10	J1B8C5	6/29/10	275		0.822	0.048		0.030	0.481	B	0.822	10.4	J	2.05	49.4	J	0.822	42.8		2.47	25100	J	9630	15.6		3.32	5.09	J	3.32	8.22	J	3.32
16	D11	J1B8C6	6/29/10	277		0.635	0.0080	B	0.020	0.459	B	0.635	12.3	J	1.59	45.7	J	0.636	38.5		1.90	66700	J	9810	34.0		3.28	19.1	J	3.28	24.3	J	3.28
17	D12	J1B8C7	6/29/10	284		0.757	0.029	U	0.029	0.302	B	0.757	10.5	J	1.89	50.2	J	0.757	36.5		2.27	6450	J	9850	2.87	J	3.19	2.65	J	3.19	1.59	J	3.19

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Mercury	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Acenapthene	Benzo(a)anthracene	Benzo(a)pyrene
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	D5	J1B8C0/ J1B8C8	6/29/10	372	0.015	0.327	13.2	48.4	43.2	5163	1.71	1.71	1.71
23	D1	J1B8B6	6/29/10	326	0.014	0.288	11.8	41.7	42.6	4950	1.64	1.64	1.64
24	D2	J1B8B7	6/29/10	222	1.07	0.315	9.91	39.4	38.7	29300	19.4	22.6	11.0
25	D3	J1B8B8	6/29/10	284	0.013	0.242	11.2	39.8	37.0	6970	1.66	1.84	1.66
26	D4	J1B8B9	6/29/10	310	0.020	0.524	11.5	58.4	40.7	4970	1.79	1.79	1.79
27	D6	J1B8C1	6/29/10	267	0.036	0.389	11.1	48.4	36.9	3590	2.31	2.59	3.52
28	D7	J1B8C2	6/29/10	333	0.012	0.327	10.0	52.5	39.5	4800	9.82	1.69	1.69
29	D8	J1B8C3	6/29/10	282	0.010	0.427	10.5	58.2	36.3	6810	1.68	1.68	1.68
30	D9	J1B8C4	6/29/10	343	0.015	0.329	11.2	43.0	39.9	5100	1.72	6.21	7.91
31	D10	J1B8C5	6/29/10	275	0.048	0.481	10.4	49.4	42.8	25100	15.6	5.09	8.22
32	D11	J1B8C6	6/29/10	277	0.008	0.459	12.3	45.7	38.5	66700	34.0	19.1	24.3
33	D12	J1B8C7	6/29/10	284	0.015	0.302	10.5	50.2	36.5	6450	2.87	2.65	1.59

34 **Statistical Computations**

35		Manganese		Mercury		Molybdenum		Nickel		Vanadium		Zinc		TPH - motor oil		Acenapthene		Benzo(a)anthracene		Benzo(a)pyrene	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	
37	N	12		12		12		12		12		12		12		12		12		12	
38	% < Detection limit	0%		50%		0%		0%		0%		0%		25%		50%		42%		50%	
39	Mean	298		0.11		0.368		11.1		47.9		39.4		14159		7.85		5.72		5.56	
40	Standard deviation	40.4		0.30		0.0872		0.96		6.40		2.61		18601		10.3		7.26		6.76	
41	95% UCL on mean	321		0.25		0.420		11.8		51.5		40.7		22992		12.7		9.16		8.77	
42	Maximum value	374		1.07		0.524		13.3		58.4		43.9		66700		34.0		22.6		24.3	
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	512	GW & River Protection	0.33	GW & River Protection	8	GW Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection	200000	DE, GW, & River Protection	96000	GW Protection	15	GW & River Protection	15	GW & River Protection
44	WAC 173-340 3-PART TEST																				
45	95% UCL > Cleanup Limit?	NA		NO		NO		NA		NA		NA		NO		NO		NO		NO	
46	> 10% above Cleanup Limit?	NA		NO		NO		NA		NA		NA		NO		NO		YES		NO	
47	Any sample > 2X Cleanup Limit?	NA		YES		NO		NA		NA		NA		NO		NO		NO		NO	
48	WAC 173-340 Compliance?	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14855

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 20 of 49

1 **128-H-1 Statistical Calculations**
2 **Verification Data - Area D**

	Sample Area	Sample Number	Sample Date	Benzo(b)fluoranthene ug/kg	Q	PQL	Benzo(ghi)perylene ug/kg	Q	PQL	Benzo(k)fluoranthene ug/kg	Q	PQL	Fluoranthene ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL
5	D5	J1B8C0	6/29/10	3.36	UJ	3.36	3.36	UJ	3.36	3.36	U	3.36	3.36	UJ	3.36	3.36	UJ	3.36	3.36	U	3.36	3.36	UJ	3.36
6	Duplicate of J1B8C0	J1B8C8	6/29/10	3.48	UJ	3.48	3.48	UJ	3.48	3.48	U	3.48	3.48	UJ	3.48	3.48	UJ	3.48	3.48	U	3.48	3.48	UJ	3.48
7	D1	J1B8B6	6/29/10	3.28	UJ	3.28	3.28	UJ	3.28	3.28	U	3.28	3.28	UJ	3.28	3.28	UJ	3.28	3.28	U	3.28	3.28	UJ	3.28
8	D2	J1B8B7	6/29/10	14.3	J	3.38	7.96	J	3.38	4.70		3.38	42.4	J	3.38	3.38	UJ	3.38	25.7		3.38	5.66	J	3.38
9	D3	J1B8B8	6/29/10	3.31	UJ	3.31	3.31	UJ	3.31	3.31	U	3.31	2.49	J	3.31	4.76	J	3.31	2.15	J	3.31	1.69	J	3.31
10	D4	J1B8B9	6/29/10	3.58	UJ	3.58	1.06	J	3.58	3.58	U	3.58	5.19	J	3.58	2.33	J	3.58	0.967	J	3.58	1.09	J	3.58
11	D6	J1B8C1	6/29/10	5.39	J	3.30	2.97	J	3.30	1.78	J	3.30	28.2	J	3.30	2.00	J	3.30	5.45		3.30	6.77	J	3.30
12	D7	J1B8C2	6/29/10	3.38	UJ	3.38	3.38	UJ	3.38	3.38	U	3.38	2.20	J	3.38	2.01	J	3.38	1.02	J	3.38	3.38	UJ	3.38
13	D8	J1B8C3	6/29/10	3.35	UJ	3.35	3.35	UJ	3.35	3.35	U	3.35	27.3	J	3.35	3.35	UJ	3.35	3.35	U	3.35	3.35	UJ	3.35
14	D9	J1B8C4	6/29/10	4.75	J	3.44	4.56	J	3.44	2.75	J	3.44	16.0	J	3.44	4.68	J	3.44	5.68		3.44	12.6	J	3.44
15	D10	J1B8C5	6/29/10	9.58	J	3.32	6.44	J	3.32	3.34		3.32	27.6	J	3.32	4.19	J	3.32	9.15		3.32	16.3	J	3.32
16	D11	J1B8C6	6/29/10	27.9	J	3.28	15.9	J	3.28	9.49		3.28	57.3	J	3.28	13.7	J	3.28	19.5		3.28	58.6	J	3.28
17	D12	J1B8C7	6/29/10	1.59	J	3.19	1.28	J	3.19	0.93	J	3.19	3.35	J	3.19	1.67	J	3.19	1.12	J	3.19	2.95	J	3.19

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19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Benzo(b)fluoranthene ug/kg	Benzo(ghi)perylene ug/kg	Benzo(k)fluoranthene ug/kg	Fluoranthene ug/kg	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg
22	D5	J1B8C0/ J1B8C8	6/29/10	1.71	1.71	1.71	1.71	1.71	1.71	1.71
23	D1	J1B8B6	6/29/10	1.64	1.64	1.64	1.64	1.64	1.64	1.64
24	D2	J1B8B7	6/29/10	14.3	7.96	4.70	42.4	1.69	25.7	5.66
25	D3	J1B8B8	6/29/10	1.66	1.66	1.66	2.49	4.76	2.15	1.69
26	D4	J1B8B9	6/29/10	1.79	1.06	1.79	5.19	2.33	0.97	1.09
27	D6	J1B8C1	6/29/10	5.39	2.97	1.78	28.2	2.00	5.45	6.77
28	D7	J1B8C2	6/29/10	1.69	1.69	1.69	2.20	2.01	1.02	1.69
29	D8	J1B8C3	6/29/10	1.68	1.68	1.68	27.3	1.68	1.68	1.68
30	D9	J1B8C4	6/29/10	4.75	4.56	2.75	16.0	4.68	5.68	12.6
31	D10	J1B8C5	6/29/10	9.58	6.44	3.34	27.6	4.19	9.15	16.3
32	D11	J1B8C6	6/29/10	27.9	15.9	9.49	57.3	13.7	19.5	58.6
33	D12	J1B8C7	6/29/10	1.59	1.28	0.93	3.35	1.67	1.12	2.95

34 **Statistical Computations**

35		Benzo(b)fluoranthene		Benzo(ghi)perylene		Benzo(k)fluoranthene		Fluoranthene		Indeno(1,2,3-cd)pyrene		Phenanthrene		Pyrene	
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	
37	N	12		12		12		12		12		12		12	
38	% < Detection limit	50%		42%		50%		17%		33%		25%		33%	
39	Mean	6.14		4.05		2.76		17.9		3.50		6.31		9.36	
40	Standard deviation	7.94		4.35		2.35		18.7		3.44		8.11		16.3	
41	95% UCL on mean	9.91		6.11		3.88		26.8		5.14		10.2		17.1	
42	Maximum value	27.9		15.9		9.49		57.3		13.7		25.7		58.6	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	15	GW & River Protection	48000	GW & River Protection	15	GW & River Protection	18000	River Protection	330	GW & River Protection	240000	GW Protection	48000	GW Protection
44	**WAC 173-340 3-PART TEST**														
45	95% UCL > Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO	
46	> 10% above Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO	
47	Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO	
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 21 of 49

128-H-1 Maximum Calculations

Verification Data - Area D

Sample Area	Sample Number	Sample Date	TPH - diesel range			Acenapthylene			Anthracene			Chrysene			Dibenz(a,h)anthracene		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
D5	J1B8C0	6/29/10	3320	U	3320	3.36	U	3.36	3.36	U	3.36	3.36	UJ	3.36	3.36	U	3.36
Duplicate of J1B8C0	J1B8C8	6/29/10	3580	U	3580	3.48	U	3.48	3.48	U	3.48	3.48	UJ	3.48	3.48	U	3.48
D1	J1B8B6	6/29/10	3300	U	3300	3.28	U	3.28	3.28	U	3.28	3.28	UJ	3.28	3.28	U	3.28
D2	J1B8B7	6/29/10	8970		3350	3.38	U	3.38	3.38	U	3.38	14.2	J	3.38	3.38	U	3.38
D3	J1B8B8	6/29/10	3340	U	3340	3.31	U	3.31	3.31	U	3.31	3.31	UJ	3.31	3.31	U	3.31
D4	J1B8B9	6/29/10	3470	U	3470	3.58	U	3.58	3.58	U	3.58	3.58	UJ	3.58	3.58	U	3.58
D6	J1B8C1	6/29/10	1060	J	3270	3.3	U	3.30	3.30	U	3.30	3.30	UJ	3.30	3.30	U	3.30
D7	J1B8C2	6/29/10	3370	U	3370	3.38	U	3.38	3.38	U	3.38	3.38	UJ	3.38	3.38	U	3.38
D8	J1B8C3	6/29/10	925	J	3320	3.35	U	3.35	3.35	U	3.35	3.35	UJ	3.35	3.35	U	3.35
D9	J1B8C4	6/29/10	3400	U	3400	3.44	U	3.44	3.44	U	3.44	5.40	J	3.44	3.44	U	3.44
D10	J1B8C5	6/29/10	5210		3210	21.6		3.32	3.32	U	3.32	8.37	J	3.32	1.10	J	3.32
D11	J1B8C6	6/29/10	28800		3270	66.2		3.28	1.31	J	3.28	17.9	J	3.3	2.59	J	3.28
D12	J1B8C7	6/29/10	3210	U	3210	3.19	U	3.19	3.19	U	3.19	1.13	J	3.19	3.19	U	3.19

Sample Area	Sample Number	Sample Date	Fluorene			Napthalene			4,4'-DDE			Aroclor-1254			Aroclor-1260		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
D5	J1B8C0	6/29/10	3.36	U	3.36	3.36	U	3.36	1.33	UD	1.33	13.2	U	13.2	13.2	U	13.2
Duplicate of J1B8C0	J1B8C8	6/29/10	3.48	U	3.48	3.48	U	3.48	1.42	UD	1.42	14.2	U	14.2	14.2	U	14.2
D1	J1B8B6	6/29/10	3.28	U	3.28	3.28	U	3.28	1.34	UD	1.34	13.4	U	13.4	13.4	U	13.4
D2	J1B8B7	6/29/10	3.38	U	3.38	3.38	U	3.38	2.46	JD	2.46	9.43	J	13.2	19.2		13.2
D3	J1B8B8	6/29/10	3.31	U	3.31	3.31	U	3.31	1.33	UD	1.33	13.3	U	13.3	13.3	U	13.3
D4	J1B8B9	6/29/10	3.58	U	3.58	3.58	U	3.58	1.43	UD	1.43	14.3	U	14.3	14.3	U	14.3
D6	J1B8C1	6/29/10	3.30	U	3.30	3.30	U	3.30	1.54	JD	1.54	13.3	U	13.3	13.3	U	13.3
D7	J1B8C2	6/29/10	3.38	U	3.38	3.38	U	3.38	1.33	UD	1.33	13.3	U	13.3	13.3	U	13.3
D8	J1B8C3	6/29/10	3.35	U	3.35	3.35	U	3.35	1.34	UD	1.34	13.4	U	13.4	13.4	U	13.4
D9	J1B8C4	6/29/10	3.44	U	3.44	3.44	U	3.44	1.36	UD	1.36	13.6	U	13.6	13.6	U	13.6
D10	J1B8C5	6/29/10	1.10	J	3.32	3.32	U	3.32	2.02	JD	2.02	13.2	U	13.2	13.2	U	13.2
D11	J1B8C6	6/29/10	4.27		3.28	6.57		3.28	1.35	UD	1.35	13.5	U	13.5	13.5	U	13.5
D12	J1B8C7	6/29/10	3.19	U	3.19	3.19	U	3.19	1.34	UD	1.34	13.4	U	13.4	13.4	U	13.4

Statistical Computations

	TPH - diesel range	Acenapthylene	Anthracene	Chrysene	Dibenz(a,h)anthracene
% < Detection limit	58%	83%	92%	58%	83%
Maximum value	28800	66.2	1.31	17.9	2.59
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	200000 DE, GW, & River Protection	96000 GW Protection	240000 GW Protection	100 River Protection	30 GW & River Protection
3-PART TEST					
Maximum > Cleanup Limit?	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

	Fluorene	Napthalene	4,4'-DDE	Aroclor-1254	Aroclor-1260
% < Detection limit	83%	92%	75%	92%	92%
Maximum value	4.27	6.57	2.46	9.43	19.2
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	64000 GW Protection	18.0 GW Protection	3.3 River Protection	17 GW & River Protection	17 GW & River Protection
3-PART TEST					
Maximum > Cleanup Limit?	NO	NO	NO	NO	YES
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0176
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 22 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area E**

	Sample Area	Sample Number	Sample Date	Arsenic			Barium			Boron			Cadmium			Chromium			Cobalt			Copper			Lead		
4				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	E-6	J1JCT4	5/31/11	5.9		0.57	88.2		0.065	2.8		0.84	0.11	B	0.035	12.4		0.050	6.8		0.086	13.2	X	0.19	5.7		0.23
6	Duplicate of J1JCT4	J1JCV1	5/31/11	6.0		0.64	87.8		0.074	2.7		0.95	0.11	B	0.040	13.6		0.056	6.9		0.097	13.2	X	0.21	5.4		0.26
7	E-1	J1JCR9	5/31/11	3.7	M	0.72	60.7		0.083	1.1	B	1.1	0.063	B	0.045	11.0		0.063	6.9		0.11	15.9	X	0.24	3.0		0.29
8	E-2	J1JCT0	5/31/11	2.2		0.58	51.4		0.067	0.98	B	0.86	0.064	B	0.036	16.5		0.051	5.9		0.088	15.0	X	0.19	4.9		0.24
9	E-3	J1JCT1	5/31/11	2.5		0.66	71.2		0.076	1.3	B	0.98	0.086	B	0.041	10.7		0.058	7.6		0.10	17.4	X	0.22	4.2		0.27
10	E-4	J1JCT2	5/31/11	1.7		0.61	49.7		0.070	0.91	U	0.91	0.041	B	0.038	9.70		0.054	5.8		0.093	13.6	X	0.2	2.6		0.25
11	E-5	J1JCT3	5/31/11	4.1		0.57	52.6		0.066	0.85	U	0.85	0.041	B	0.036	9.40		0.050	5.1		0.087	21.9	X	0.19	6.5		0.24
12	E-7	J1JCT5	5/31/11	3.1		0.64	52.6		0.073	0.94	U	0.94	0.048	B	0.040	10.8		0.056	5.2		0.096	14.2	X	0.21	8.1		0.26
13	E-8	J1JCT6	5/31/11	2.9		0.61	70.7		0.071	1.3	B	0.91	0.076	B	0.038	13.3		0.054	6.3		0.093	13.1	X	0.20	4.9		0.25
14	E-9	J1JCT7	5/31/11	2.7		0.63	49.8		0.073	0.94	U	0.94	0.039	U	0.039	11.0		0.056	5.7		0.096	14.5	X	0.21	4.5		0.26
15	E-10	J1JCT8	5/31/11	4.5		0.64	74.0		0.074	1.6	B	0.95	0.083	B	0.040	11.8		0.056	5.8		0.097	10.7	X	0.21	11.6		0.26
16	E-11	J1JCT9	5/31/11	2.5		0.63	41.6		0.073	0.94	U	0.94	0.042	B	0.039	12.8		0.056	5.6		0.096	16.1	X	0.21	3.2		0.26
17	E-12	J1JCV0	5/31/11	1.7		0.67	43.6		0.077	0.99	U	0.99	0.045	B	0.041	9.6		0.058	6.6		0.10	15.9	X	0.22	2.8		0.27

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19 **Statistical Computation Input Data**

20	Sample Area	Sample Number	Sample Date	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead
21				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
22	E-6	J1JCT4/ J1JCV1	5/31/11	6.0	88.0	2.8	0.11	13.0	6.9	13.2	5.6
23	E-1	J1JCR9	5/31/11	3.7	60.7	1.1	0.063	11.0	6.9	15.9	3.0
24	E-2	J1JCT0	5/31/11	2.2	51.4	0.98	0.064	16.5	5.9	15.0	4.9
25	E-3	J1JCT1	5/31/11	2.5	71.2	1.3	0.086	10.7	7.6	17.4	4.2
26	E-4	J1JCT2	5/31/11	1.7	49.7	0.46	0.041	9.7	5.8	13.6	2.6
27	E-5	J1JCT3	5/31/11	4.1	52.6	0.43	0.041	9.4	5.1	21.9	6.5
28	E-7	J1JCT5	5/31/11	3.1	52.6	0.47	0.048	10.8	5.2	14.2	8.1
29	E-8	J1JCT6	5/31/11	2.9	70.7	1.3	0.076	13.3	6.3	13.1	4.9
30	E-9	J1JCT7	5/31/11	2.7	49.8	0.47	0.020	11.0	5.7	14.5	4.5
31	E-10	J1JCT8	5/31/11	4.5	74.0	1.6	0.083	11.8	5.8	10.7	11.6
32	E-11	J1JCT9	5/31/11	2.5	41.6	0.47	0.042	12.8	5.6	16.1	3.2
33	E-12	J1JCV0	5/31/11	1.7	43.6	0.50	0.045	9.6	6.6	15.9	2.8

34 **Statistical Computations**

35		Arsenic		Barium		Boron		Cadmium		Chromium		Cobalt		Copper		Lead	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
37	N	12		12		12		12		12		12		12		12	
38	% < Detection limit	0%		0%		50%		8%		0%		0%		0%		0%	
39	Mean	3.1		58.8		0.98		0.060		11.6		6.1		15.1		5.2	
40	Standard deviation	1.2		14.2		0.70		0.025		2.0		0.75		2.77		2.6	
41	95% UCL on mean	4.0		67.1		1.3		0.082		12.7		6.5		16.7		6.9	
42	Maximum value	6.0		88.2		2.8		0.11		16.5		7.6		21.9		11.6	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	20	DE, GW & River Protection	200	GW Protection	320	GW Protection	0.61	GW & River Protection	18.5	GW & River Protection	15.7	GW Protection	22.0	River Protection	10.2	GW & River Protection
44	**WAC 173-340 3-PART TEST**																
45	95% UCL > Cleanup Limit?	NA		NA		NO		NA		NA		NA		NA		NO	
46	> 10% above Cleanup Limit?	NA		NA		NO		NA		NA		NA		NA		NO	
47	Any sample > 2X Cleanup Limit?	NA		NA		NO		NA		NA		NA		NA		NO	
48	**WAC 173-340 Compliance?**	Because all values are below background (6.5 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen | Date 07/13/11 | Calc. No. 0100H-CA-V017[illegible] | Rev. No. 0

Project 100-H Field Remediation | Job No. 14655 | Checked J. D. Skoglie | Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 23 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area E**

3	Sample	Sample	Sample	Manganese			Mercury			Nickel			Vanadium			Zinc			TPH - motor oil			Bis(2-ethylhexyl)phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	E-6	J1JCT4	5/31/11	324		0.086	0.0076	B	0.0053	11.4		0.11	35.9		0.081	39.6	X	0.34	1600	J	1000	76	JB	47
6	Duplicate of J1JCT4	J1JCV1	5/31/11	310		0.097	0.074		0.0057	11.7		0.12	38.0		0.091	40.5	X	0.39	980	U	980	66	JB	45
7	E-1	J1JCR9	5/31/11	284		0.11	0.0057	U	0.0057	10.6	M	0.13	46.6		0.10	35.1	X	0.43	1100	U	1100	51	U	51
8	E-2	J1JCT0	5/31/11	230		0.088	0.0054	B	0.0051	13.6		0.11	38.1		0.083	34.0	X	0.35	380000		990	45	U	45
9	E-3	J1JCT1	5/31/11	331		0.10	0.0063	B	0.0055	11.9		0.12	41.8		0.094	37.5	X	0.40	1000	U	1000	76	JB	45
10	E-4	J1JCT2	5/31/11	225		0.093	0.0072	B	0.0056	9.1		0.11	37.8		0.087	29.8	X	0.37	12000		980	74	JB	46
11	E-5	J1JCT3	5/31/11	203		0.087	0.0055	U	0.0055	9.9		0.11	36.0		0.082	30.9	X	0.35	2700	J	990	70	JB	44
12	E-7	J1JCT5	5/31/11	197		0.096	0.011	B	0.0049	9.4		0.12	36.3		0.091	31.8	X	0.38	1900	J	1000	77	JB	46
13	E-8	J1JCT6	5/31/11	266		0.093	0.0049	U	0.0049	12.3		0.11	35.6		0.087	39.0	X	0.37	1000	U	1000	74	JB	45
14	E-9	J1JCT7	5/31/11	201		0.096	0.0054	U	0.0054	10.2		0.12	41.0		0.090	31.5	X	0.38	960	U	960	75	JB	45
15	E-10	J1JCT8	5/31/11	251		0.097	0.0054	U	0.0054	10.6		0.12	33.8		0.091	34.1	X	0.39	1900	J	1000	69	JB	46
16	E-11	J1JCT9	5/31/11	212		0.096	0.0062	B	0.0055	11.0		0.12	37.3		0.090	31.2	X	0.38	1000	J	1000	74	JB	46
17	E-12	J1JCV0	5/31/11	236		0.10	0.0056	U	0.0056	9.8		0.12	44.0		0.095	37.0	X	0.40	1000	U	1000	72	JB	45

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Mercury	Nickel	Vanadium	Zinc	TPH - motor oil	Bis(2-ethylhexyl)phthalate
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg
22	E-6	J1JCT4/ J1JCV1	5/31/11	317	0.041	11.6	37.0	40.1	1045	71
23	E-1	J1JCR9	5/31/11	284	0.0029	10.6	46.6	35.1	550	26
24	E-2	J1JCT0	5/31/11	230	0.0054	13.6	38.1	34.0	380000	23
25	E-3	J1JCT1	5/31/11	331	0.0063	11.9	41.8	37.5	500	76
26	E-4	J1JCT2	5/31/11	225	0.0072	9.1	37.8	29.8	12000	74
27	E-5	J1JCT3	5/31/11	203	0.0028	9.9	36.0	30.9	2700	70
28	E-7	J1JCT5	5/31/11	197	0.011	9.4	36.3	31.8	1900	77
29	E-8	J1JCT6	5/31/11	266	0.0025	12.3	35.6	39.0	500	74
30	E-9	J1JCT7	5/31/11	201	0.0027	10.2	41.0	31.5	480	75
31	E-10	J1JCT8	5/31/11	251	0.0027	10.6	33.8	34.1	1900	69
32	E-11	J1JCT9	5/31/11	212	0.0062	11.0	37.3	31.2	1000	74
33	E-12	J1JCV0	5/31/11	236	0.0028	9.8	44.0	37.0	500	72

34 **Statistical Computations**

35		Manganese		Mercury		Nickel		Vanadium		Zinc		TPH - motor oil		Bis(2-ethylhexyl)phthalate	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	
37	N	12		12		12		12		12		12		12	
38	% < Detection limit	0%		50%		0%		0%		0%		42%		17%	
39	Mean	246		0.0078		10.8		38.8		34.3		33590		65	
40	Standard deviation	45.1		0.011		1.31		3.8		3.4		109138		19	
41	95% UCL on mean	271		0.013		11.5		40.8		36.2		85416		74	
42	Maximum value	331		0.074		13.6		46.6		40.5		380000		77	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	512	GW & River Protection	0.33	GW & River Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection	200000	DE, GW, & River Protection	360	River Protection
44	**WAC 173-340 3-PART TEST**														
45	95% UCL > Cleanup Limit?	NA		NA		NA		NA		NA		NO		NO	
46	> 10% above Cleanup Limit?	NA		NA		NA		NA		NA		NO		NO	
47	Any sample > 2X Cleanup Limit?	NA		NA		NA		NA		NA		NO		NO	
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 24 of 49

1 **128-H-1 Maximum Calculations**
2 **Verification Data - Area E**

	Sample Area	Sample Number	Sample Date	Beryllium mg/kg	Q	PQL	Hexavalent chromium mg/kg	Q	PQL	Molybdenum mg/kg	Q	PQL	TPH - diesel range ug/kg	Q	PQL	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL	Chrysene ug/kg	Q	PQL	Fluoranthene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL
5	E-6	J1JCT4	5/31/11	0.16	B	0.028	0.154	U	0.154	0.22	U	0.22	690	U	690	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
6	Duplicate of J1JCT4	J1JCV1	5/31/11	0.17	B	0.032	0.154	U	0.154	0.25	U	0.25	660	U	660	3.2	U	3.2	4.2	U	4.2	4.8	U	4.8	13	U	13	12	U	12
7	E-1	J1JCR9	5/31/11	0.036	U	0.036	0.155	U	0.155	0.49	B	0.28	770	U	770	3.6	U	3.6	4.8	U	4.8	5.5	U	5.5	15	U	15	14	U	14
8	E-2	J1JCT0	5/31/11	0.029	U	0.029	0.917		0.154	0.23	U	0.23	160000		670	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
9	E-3	J1JCT1	5/31/11	0.066	B	0.033	0.154	U	0.154	0.26	U	0.26	680	U	680	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
10	E-4	J1JCT2	5/31/11	0.031	U	0.031	0.155	U	0.155	0.24	U	0.24	3700	J	670	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
11	E-5	J1JCT3	5/31/11	0.029	U	0.029	0.154	U	0.154	0.23	U	0.23	670	U	670	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
12	E-7	J1JCT5	5/31/11	0.032	U	0.032	0.154	U	0.154	0.25	U	0.25	680	U	680	3.2	U	3.2	4.2	U	4.2	4.8	U	4.8	13	U	13	12	U	12
13	E-8	J1JCT6	5/31/11	0.13	B	0.031	0.154	U	0.154	0.24	U	0.24	680	U	680	3.1	U	3.1	4.1	U	4.1	4.7	U	4.7	13	U	13	12	U	12
14	E-9	J1JCT7	5/31/11	0.032	U	0.032	0.153	U	0.153	0.25	U	0.25	650	U	650	3.1	U	3.1	4.1	U	4.1	4.8	U	4.8	13	U	13	12	U	12
15	E-10	J1JCT8	5/31/11	0.11	B	0.032	0.155	U	0.155	0.25	U	0.25	680	U	680	12	J	3.3	13	J	4.3	15	J	4.9	23	J	13	30	J	12
16	E-11	J1JCT9	5/31/11	0.068	B	0.032	0.154	U	0.154	0.25	U	0.25	690	U	690	3.2	U	3.2	4.3	U	4.3	4.9	U	4.9	13	U	13	12	U	12
17	E-12	J1JCV0	5/31/11	0.033	U	0.033	0.154	U	0.154	0.26	U	0.26	680	U	680	3.1	U	3.1	4.1	U	4.1	4.7	U	4.7	13	U	13	12	U	12

18 **Statistical Computations**

19		Beryllium	Hexavalent chromium	Molybdenum	TPH - diesel range	Benzo(a)anthracene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Pyrene
20	% < Detection limit	58%	92%	92%	83%	92%	92%	92%	92%	92%
21	Maximum value	0.17	0.917	0.49	160000	12	13	15	23	30
22	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	1.51 GW & River Protection	2 GW Protection	8 GW Protection	200000 DE, GW & River Protection	15 GW & River Protection	15 GW & River Protection	100 River Protection	18000 River Protection	48000 GW Protection
23	**3-PART TEST**									
24	Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
25	> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
26	Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
27	**3-Part Test Compliance?**	Because all values are below background (1.51 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

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CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen   Date 07/13/11   Calc. No. 0100H-CA-V0178   Rev. No. 0

Project 100-H Field Remediation   Job No. 14655   Checked J. D. Skoglie   Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations   Sheet No. 25 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area F**

Row	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Beryllium mg/kg	Beryllium Q	Beryllium PQL	Boron mg/kg	Boron Q	Boron PQL	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL	Copper mg/kg	Copper Q	Copper PQL	Lead mg/kg	Lead Q	Lead PQL
5	F-2	J1JCV3	5/26/11	3.9		0.65	93.4		0.075	0.27		0.033	2.1		0.97	0.091	B	0.041	12.2		0.057	7.0	X	0.099	12.5	0	0.21	5.4		0.27
6	Duplicate of J1JCV3	J1JCW4	5/26/11	3.9		0.66	89.4		0.076	0.27		0.033	2.0		0.98	0.087	B	0.041	12.7		0.058	6.9	X	0.10	13.0	0	0.22	5.2		0.27
7	F-1	J1JCV2	5/26/11	3.8		0.65	84.3		0.075	0.25		0.032	1.5	B	0.96	0.083	B	0.040	12.6		0.057	7.1	X	0.098	14.0	0	0.21	6.7		0.27
8	F-3	J1JCV4	5/26/11	3.4		0.63	84.9		0.073	0.27		0.032	1.4	B	0.94	0.082	B	0.039	15.2		0.056	7.1	X	0.096	14.1	0	0.21	5.5		0.26
9	F-4	J1JCV5	5/26/11	3.4		0.63	93.9		0.073	0.26		0.032	1.9		0.94	0.11	B	0.039	12.5		0.056	7.0	X	0.096	11.6	0	0.21	5.4		0.26
10	F-5	J1JCV6	5/26/11	4.0		0.6	89.1		0.069	0.28		0.030	1.4	B	0.89	0.070	B	0.037	12.4		0.053	7.4	X	0.091	13.8	0	0.2	5.6		0.25
11	F-6	J1JCV7	5/26/11	4.1		0.68	97.6		0.078	0.29		0.034	1.6	B	1.0	0.094	B	0.042	15.0		0.060	7.4	X	0.10	13.2	0	0.22	5.7		0.28
12	F-7	J1JCV8	5/26/11	3.3		0.61	96.7		0.070	0.28		0.031	1.6	B	0.91	0.097	B	0.038	12.5		0.054	7.6	X	0.092	13.4	0	0.200	5.8		0.25
13	F-8	J1JCV9	5/26/11	3.4		0.65	74.3		0.075	0.23		0.032	1.4	B	0.96	0.080	B	0.040	11.7		0.057	6.8	X	0.098	15	0	0.210	5.3		0.26
14	F-9	J1JCW0	5/26/11	3.4		0.61	72.6		0.070	0.24		0.030	1.5	B	0.90	0.076	B	0.038	11.8		0.053	7.0	X	0.092	14.1	0	0.200	5.5		0.25
15	F-10	J1JCW1	5/26/11	3.4		0.67	67.3		0.077	0.22		0.034	1.8	B	1.0	0.086	B	0.042	18.0		0.059	7.2	X	0.10	17.3	0	0.22	5.3		0.27
16	F-11	J1JCW2	5/26/11	3.2		0.61	64.7		0.071	0.17	B	0.031	1.3	B	0.91	0.069	B	0.038	9.3		0.054	6.4	X	0.093	15.1	0	0.2	3.9		0.25
17	F-12	J1JCW3	5/26/11	3.6		0.59	88.9		0.068	0.29		0.030	1.9		0.88	0.085	B	0.037	12.9		0.052	7.7	X	0.089	14.9	0	0.19	6.1		0.24

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19 **Statistical Computation Input Data**

Row	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg
22	F-2	J1JCV3/ J1JCW4	5/26/11	3.9	91.4	0.27	2.1	0.089	12.5	7.0	12.8	5.3
23	F-1	J1JCV2	5/26/11	3.8	84.3	0.25	1.5	0.083	12.6	7.1	14.0	6.7
24	F-3	J1JCV4	5/26/11	3.4	84.9	0.27	1.4	0.082	15.2	7.1	14.1	5.5
25	F-4	J1JCV5	5/26/11	3.4	93.9	0.26	1.9	0.11	12.5	7.0	11.6	5.4
26	F-5	J1JCV6	5/26/11	4.0	89.1	0.28	1.4	0.070	12.4	7.4	13.8	5.6
27	F-6	J1JCV7	5/26/11	4.1	97.6	0.29	1.6	0.094	15.0	7.4	13.2	5.7
28	F-7	J1JCV8	5/26/11	3.3	96.7	0.28	1.6	0.097	12.5	7.6	13.4	5.8
29	F-8	J1JCV9	5/26/11	3.4	74.3	0.23	1.4	0.080	11.7	6.8	15.0	5.3
30	F-9	J1JCW0	5/26/11	3.4	72.6	0.24	1.5	0.076	11.8	7.0	14.1	5.5
31	F-10	J1JCW1	5/26/11	3.4	67.3	0.22	1.8	0.086	18.0	7.2	17.3	5.3
32	F-11	J1JCW2	5/26/11	3.2	64.7	0.17	1.3	0.069	9.3	6.4	15.1	3.9
33	F-12	J1JCW3	5/26/11	3.6	88.9	0.29	1.9	0.085	12.9	7.7	14.9	6.1

34 **Statistical Computations**

Row		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	0%
39	Mean	3.6	83.8	0.25	1.6	0.085	13.0	7.1	14.1	5.5
40	Standard deviation	0.30	11.4	0.035	0.24	0.012	2.2	0.38	1.42	0.65
41	95% UCL on mean	3.7	90.6	0.27	1.7	0.092	14.1	7.3	14.9	5.8
42	Maximum value	4.1	97.6	0.29	2.1	0.11	18.0	7.7	17.3	6.7
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection
44	WAC 173-340 3-PART TEST									
45	95% UCL > Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA	NA
46	> 10% above Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA	NA
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA	NA
48	WAC 173-340 Compliance?	Because all values are below background (6.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (10.2 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen　　Date 07/13/11　　Calc. No. 0100H-CA-V0178　　Rev. No. 0

Project 100-H Field Remediation　　Job No. 14655　　Checked J. D. Skoglie　　Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations　　Sheet No. 26 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area F**

3	Sample	Sample	Sample	Manganese			Nickel			Vanadium			Zinc			TPH - diesel range			TPH - motor oil			Bis(2-ethylhexyl)phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	F-2	J1JCV3	5/26/11	330		0.099	11.9		0.12	38.1		0.093	39.8		0.39	700	U	700	1100	J	1000	47	U	47
6	Duplicate of J1JCV3	J1JCW4	5/26/11	329		0.10	12.4		0.12	37.8		0.094	40.3		0.40	650	U	650	1200	J	960	78	JB	46
7	F-1	J1JCV2	5/26/11	315		0.098	12.8		0.12	38.5		0.092	38.8		0.39	650	J	650	1400	J	950	46	U	46
8	F-3	J1JCV4	5/26/11	309		0.096	13.9		0.12	38.6		0.090	39.0		0.38	690	U	690	1200	J	1000	77	JB	48
9	F-4	J1JCV5	5/26/11	342		0.096	11.4		0.12	38.7		0.090	41.9		0.38	700	U	700	1100	J	1000	74	JB	49
10	F-5	J1JCV6	5/26/11	326		0.091	12.6		0.11	40.0		0.085	39.6		0.36	660	U	660	1400	J	980	71	JB	45
11	F-6	J1JCV7	5/26/11	359		0.10	14.3		0.13	40.4		0.096	43.8		0.41	690	U	690	1000	J	1000	73	JB	46
12	F-7	J1JCV8	5/26/11	351		0.092	12.4		0.11	41.7		0.087	42.0		0.37	690	U	690	1000	U	1000	66	JB	45
13	F-8	J1JCV9	5/26/11	305		0.098	12.3		0.12	41.0		0.092	37.8		0.39	11000		680	26000		1000	45	U	45
14	F-9	J1JCW0	5/26/11	297		0.092	12.4		0.11	40.1		0.086	37.6		0.37	4300		670	7500		990	46	U	46
15	F-10	J1JCW1	5/26/11	291		0.10	14.9		0.13	42.0		0.096	38.4		0.40	2800	J	680	7600		970	45	U	45
16	F-11	J1JCW2	5/26/11	250		0.093	10.6		0.11	40.1		0.087	33.0		0.37	24000		650	25000		960	44	U	44
17	F-12	J1JCW3	5/26/11	342		0.089	13.2		0.11	41.2		0.084	41.6		0.36	4600		680	8400		1000	46	U	46

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Nickel	Vanadium	Zinc	TPH - diesel range	TPH - motor oil	Bis(2-ethylhexyl)phthalate
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg
22	F-2	J1JCV3/ J1JCW4	5/26/11	330	12.2	38.0	40.1	338	1150	50
23	F-1	J1JCV2	5/26/11	315	12.8	38.5	38.8	650	1400	23
24	F-3	J1JCV4	5/26/11	309	13.9	38.6	39.0	345	1200	77
25	F-4	J1JCV5	6/26/11	342	11.4	38.7	41.9	350	1100	74
26	F-5	J1JCV6	5/26/11	326	12.6	40.0	39.6	330	1400	71
27	F-6	J1JCV7	5/26/11	359	14.3	40.4	43.8	345	1000	73
28	F-7	J1JCV8	5/26/11	351	12.4	41.7	42.0	345	500	66
29	F-8	J1JCV9	5/26/11	305	12.3	41.0	37.8	11000	26000	23
30	F-9	J1JCW0	5/26/11	297	12.4	40.1	37.6	4300	7500	23
31	F-10	J1JCW1	5/26/11	291	14.9	42.0	38.4	2800	7600	23
32	F-11	J1JCW2	5/26/11	250	10.6	40.1	33.0	24000	25000	22
33	F-12	J1JCW3	5/26/11	342	13.2	41.2	41.6	4600	8400	23

34 **Statistical Computations**

35		Manganese	Nickel	Vanadium	Zinc	TPH - diesel range	TPH - motor oil	Bis(2-ethylhexyl)phthalate
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	50%	8%	50%
39	Mean	318	12.7	40.0	39.5	4117	6854	46
40	Standard deviation	30.4	1.2	1.3	2.8	7021	9200	25
41	95% UCL on mean	336	13.4	40.7	41.0	7451	11223	57
42	Maximum value	359	14.9	42.0	43.8	24000	26000	77
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	512 GW & River Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	200000 DE, GW, & River Protection	360 River Protection
44	**WAC 173-340 3-PART TEST**							
45	95% UCL > Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
46	> 10% above Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen TQ
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie JDS

Rev. No. 0
Date 07/13/11

128-H-1 Maximum Calculations

Verification Data - Area F

Sample Area	Sample Number	Sample Date	Hexavalent chromium			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	0.265		0.154	0.0053	U	0.0053
Duplicate of J1JCV3	J1JCW4	5/26/11	0.154	U	0.154	0.0052	U	0.0052
F-1	J1JCV2	5/26/11	0.154	U	0.154	0.0073	B	0.0057
F-3	J1JCV4	5/26/11	0.154	U	0.154	0.0057	U	0.0057
F-4	J1JCV5	5/26/11	0.223		0.155	0.0054	U	0.0054
F-5	J1JCV6	5/26/11	0.155	U	0.155	0.0053	U	0.0053
F-6	J1JCV7	5/26/11	0.221		0.155	0.0054	U	0.0054
F-7	J1JCV8	5/26/11	0.154	U	0.154	0.0053	U	0.0053
F-8	J1JCV9	5/26/11	0.154	U	0.154	0.0057	U	0.0057
F-9	J1JCW0	5/26/11	0.154	U	0.154	0.0067	B	0.0057
F-10	J1JCW1	5/26/11	0.154	U	0.154	0.0094	B	0.0050
F-11	J1JCW2	5/26/11	0.155	U	0.155	0.0052	U	0.0052
F-12	J1JCW3	5/26/11	0.154	U	0.154	0.0053	U	0.0053

Statistical Computations

	Hexavalent chromium		Mercury	
% < Detection limit	75%		75%	
Maximum value	0.265		0.0094	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	2	GW Protection	0.33	GW & River Protection
3-PART TEST				
Maximum > Cleanup Limit?	NO		NA	
> 10% above Cleanup Limit?	NO		NA	
Any sample > 2X Cleanup Limit?	NO		NA	
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (0.33 mg/kg) the 3-part test is not required.	

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14855	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 28 of 49

Ecology Software (MTCAStat) Results, Area A

Arsenic 95% UCL Calculation

DATA	ID				
	J1B856/				
46.4	J1B866				
15.1	J1B854				
23.5	J1B855	Number of samples		Uncensored values	
56.8	J1B857	Uncensored	12	Mean	33.4
31.8	J1B858	Censored		Lognormal mean	33.9
42.4	J1B859	Detection limit or PQL		Std. devn.	13.6
29.7	J1B860	Method detection limit		Median	32.8
33.8	J1B861	TOTAL	12	Min.	15.1
40.5	J1JVX2			Max.	56.8
47.6	J1B863				
16.5	J1B864				
17.3	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.942 r-squared is: 0.966
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 45.0

Barium 95% UCL Calculation

DATA	ID				
	J1B856/				
79.9	J1B866				
70.0	J1B854				
79.5	J1B855	Number of samples		Uncensored values	
81.8	J1B857	Uncensored	12	Mean	80.3
69.0	J1B858	Censored		Lognormal mean	80.3
77.8	J1B859	Detection limit or PQL		Std. devn.	9.34
79.1	J1B860	Method detection limit		Median	79.7
83.7	J1B861	TOTAL	12	Min.	69.0
80.1	J1JVX2			Max.	105
85.5	J1B863				
72.1	J1B864				
105	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.857 r-squared is: 0.812
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 84.7

Beryllium 95% UCL Calculation

DATA	ID				
	J1B856/				
0.269	J1B866				
0.219	J1B854				
0.302	J1B855	Number of samples		Uncensored values	
0.278	J1B857	Uncensored	12	Mean	0.252
0.271	J1B858	Censored		Lognormal mean	0.252
0.275	J1B859	Detection limit or PQL		Std. devn.	0.0419
0.241	J1B860	Method detection limit		Median	0.261
0.253	J1B861	TOTAL	12	Min.	0.184
0.210	J1JVX2			Max.	0.321
0.321	J1B863				
0.200	J1B864				
0.184	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.965 r-squared is: 0.974
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.277

Boron 95% UCL Calculation

DATA	ID				
	J1B856/				
2.78	J1B866				
1.96	J1B854				
2.37	J1B855	Number of samples		Uncensored values	
3.20	J1B857	Uncensored	12	Mean	2.57
2.53	J1B858	Censored		Lognormal mean	2.58
2.79	J1B859	Detection limit or PQL		Std. devn.	0.421
3.17	J1B860	Method detection limit		Median	2.62
2.58	J1B861	TOTAL	12	Min.	1.93
2.80	J1JVX2			Max.	3.20
2.66	J1B863				
2.11	J1B864				
1.93	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.942 r-squared is: 0.955
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.83

Cadmium 95% UCL Calculation

DATA	ID				
	J1B856/				
0.0870	J1B866				
0.187	J1B854				
0.122	J1B855	Number of samples		Uncensored values	
0.148	J1B857	Uncensored	12	Mean	0.145
0.113	J1B858	Censored		Lognormal mean	0.146
0.179	J1B859	Detection limit or PQL		Std. devn.	0.0566
0.177	J1B860	Method detection limit		Median	0.122
0.0910	J1B861	TOTAL	12	Min.	0.0870
0.290	J1JVX2			Max.	0.290
0.116	J1B863				
0.121	J1B864				
0.114	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.924 r-squared is: 0.824
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.179

Chromium 95% UCL Calculation

DATA	ID				
	J1B856/				
12.1	J1B866				
10.8	J1B854				
14.6	J1B855	Number of samples		Uncensored values	
13.0	J1B857	Uncensored	12	Mean	12.5
12.7	J1B858	Censored		Lognormal mean	12.5
13.1	J1B859	Detection limit or PQL		Std. devn.	1.19
11.6	J1B860	Method detection limit		Median	12.7
12.7	J1B861	TOTAL	12	Min.	10.2
12.4	J1JVX2			Max.	14.6
13.7	J1B863				
10.2	J1B864				
12.6	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.949 r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.1

Cobalt 95% UCL Calculation

DATA	ID				
	J1B856/				
5.97	J1B866				
6.37	J1B854				
6.69	J1B855	Number of samples		Uncensored values	
6.16	J1B857	Uncensored	12	Mean	6.31
6.14	J1B858	Censored		Lognormal mean	6.31
5.95	J1B859	Detection limit or PQL		Std. devn.	0.437
5.47	J1B860	Method detection limit		Median	6.27
5.92	J1B861	TOTAL	12	Min.	5.47
6.60	J1JVX2			Max.	6.84
6.75	J1B863				
6.84	J1B864				
6.80	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.930 r-squared is: 0.935
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.55

Copper 95% UCL Calculation

DATA	ID				
	J1B856/				
13.4	J1B866				
13.1	J1B854				
13.8	J1B855	Number of samples		Uncensored values	
12.6	J1B857	Uncensored	12	Mean	13.1
12.3	J1B858	Censored		Lognormal mean	13.1
12.7	J1B859	Detection limit or PQL		Std. devn.	0.645
12.8	J1B860	Method detection limit		Median	13.1
12.0	J1B861	TOTAL	12	Min.	12.0
14.0	J1JVX2			Max.	14.0
13.7	J1B863				
13.8	J1B864				
13.0	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.967 r-squared is: 0.968
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.4

Lead 95% UCL Calculation

DATA	ID				
	J1B856/				
138	J1B866				
73.6	J1B854				
84.2	J1B855	Number of samples		Uncensored values	
406	J1B857	Uncensored	12	Mean	192
164	J1B858	Censored		Lognormal mean	196
278	J1B859	Detection limit or PQL		Std. devn.	119
319	J1B860	Method detection limit		Median	151
98.0	J1B861	TOTAL	12	Min.	73.6
348	J1JVX2			Max.	406
224	J1B863				
88.3	J1B864				
86.0	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.918 r-squared is: 0.889
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 304

CALCULATION SHEET

Washington Closure Hanford			
Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 29 of 49

Ecology Software (MTCAStat) Results, Area A

Manganese 95% UCL Calculation

DATA	ID
302	J1B856/ J1B866
301	J1B854
329	J1B855
331	J1B857
304	J1B858
300	J1B859
289	J1B860
291	J1B861
311	J1JVX2
326	J1B863
282	J1B864
302	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	306
Censored		Lognormal mean	306
Detection limit or PQL		Std. devn.	15.9
Method detection limit		Median	302
TOTAL	12	Min.	282
		Max.	331

Lognormal distribution? r-squared is: 0.934
Normal distribution? r-squared is: 0.928
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 314

Molybdenum 95% UCL Calculation

DATA	ID
0.311	J1B856/ J1B866
0.346	J1B854
0.422	J1B855
0.459	J1B857
0.354	J1B858
0.337	J1B859
0.421	J1B860
0.368	J1B861
0.280	J1JVX2
0.315	J1B863
0.369	J1B864
0.369	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	0.363
Censored		Lognormal mean	0.363
Detection limit or PQL		Std. devn.	0.0515
Method detection limit		Median	0.361
TOTAL	12	Min.	0.280
		Max.	0.459

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.963
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.392

Nickel 95% UCL Calculation

DATA	ID
10.6	J1B856/ J1B866
9.50	J1B854
12.6	J1B855
10.4	J1B857
10.0	J1B858
10.6	J1B859
11.0	J1B860
10.5	J1B861
10.7	J1JVX2
11.7	J1B863
9.32	J1B864
8.99	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	10.5
Censored		Lognormal mean	10.5
Detection limit or PQL		Std. devn.	1.00
Method detection limit		Median	10.5
TOTAL	12	Min.	8.99
		Max.	12.6

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.948
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.0

Vanadium 95% UCL Calculation

DATA	ID
37.8	J1B856/ J1B866
50.0	J1B854
45.6	J1B855
43.4	J1B857
42.8	J1B858
41.6	J1B859
41.1	J1B860
41.3	J1B861
38.1	J1JVX2
44.8	J1B863
50.7	J1B864
54.8	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	44.3
Censored		Lognormal mean	44.3
Detection limit or PQL		Std. devn.	5.19
Method detection limit		Median	43.1
TOTAL	12	Min.	37.8
		Max.	54.8

Lognormal distribution? r-squared is: 0.953
Normal distribution? r-squared is: 0.935
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 47.2

Zinc 95% UCL Calculation

DATA	ID
43.9	J1B856/ J1B866
40.5	J1B854
43.0	J1B855
50.7	J1B857
43.8	J1B858
50.1	J1B859
48.7	J1B860
42.0	J1B861
49.3	J1JVX2
58.5	J1B863
43.2	J1B864
47.4	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	46.6
Censored		Lognormal mean	46.6
Detection limit or PQL		Std. devn.	5.05
Method detection limit		Median	45.7
TOTAL	12	Min.	40.5
		Max.	58.5

Lognormal distribution? r-squared is: 0.925
Normal distribution? r-squared is: 0.900
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 49.5

TPH - motor oil 95% UCL Calculation

DATA	ID
26250	J1B856/ J1B866
8010	J1B854
24800	J1B855
54300	J1B857
12400	J1B858
26900	J1B859
70400	J1B860
21400	J1B861
14100	J1B863
13500	J1B864
12400	J1B865

Number of samples		Uncensored values	
Uncensored	11	Mean	25860
Censored		Lognormal mean	25993
Detection limit or PQL		Std. devn.	19460
Method detection limit		Median	21400
TOTAL	11	Min.	8010
		Max.	70400

Lognormal distribution? r-squared is: 0.938
Normal distribution? r-squared is: 0.784
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 42694

Anthracene 95% UCL Calculation

DATA	ID
3.87	J1B856/ J1B866
1.66	J1B854
1.64	J1B855
1.33	J1B857
1.18	J1B858
5.93	J1B859
3.63	J1B860
2.30	J1B861
1.40	J1JVX2
1.21	J1B863
1.61	J1B864
1.83	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	2.28
Censored		Lognormal mean	2.27
Detection limit or PQL		Std. devn.	1.46
Method detection limit		Median	1.64
TOTAL	12	Min.	1.18
		Max.	5.93

Lognormal distribution? r-squared is: 0.852
Normal distribution? r-squared is: 0.738
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 2.97

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
32.6	J1B856/ J1B866
3.04	J1B854
4.51	J1B855
23.9	J1B857
15.3	J1B858
51.4	J1B859
39.0	J1B860
28.2	J1B861
31.0	J1JVX2
26.7	J1B863
9.00	J1B864
6.20	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	22.6
Censored		Lognormal mean	25.4
Detection limit or PQL		Std. devn.	15.2
Method detection limit		Median	25.3
TOTAL	12	Min.	3.04
		Max.	51.4

Lognormal distribution? r-squared is: 0.911
Normal distribution? r-squared is: 0.953
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 55.3

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
61.4	J1B856/ J1B866
6.65	J1B854
8.07	J1B855
51.5	J1B857
55.0	J1B858
88.0	J1B859
63.9	J1B860
43.8	J1B861
58.0	J1JVX2
48.8	J1B863
17.0	J1B864
10.7	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	42.7
Censored		Lognormal mean	48.4
Detection limit or PQL		Std. devn.	26.2
Method detection limit		Median	50.2
TOTAL	12	Min.	6.65
		Max.	88.0

Lognormal distribution? r-squared is: 0.837
Normal distribution? r-squared is: 0.916
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 56.3

CALCULATION SHEET

Ecology Software (MTCAStat) Results, Area A

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
37.0	J1B856/ J1B866
5.79	J1B854
6.02	J1B855
34.4	J1B857
40.3	J1B858
60.0	J1B859
46.8	J1B860
30.8	J1B861
34.0	J1JVX2
30.9	J1B863
15.3	J1B864
11.9	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	29.4
Censored		Lognormal mean	32.0
Detection limit or PQL		Std. devn.	16.7
Method detection limit		Median	32.5
TOTAL	12	Min.	5.79
		Max.	60.0

Lognormal distribution? r-squared is: 0.866
Normal distribution? r-squared is: 0.949
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 38.1

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
35.5	J1B856/ J1B866
4.84	J1B854
5.76	J1B855
39.7	J1B857
51.9	J1B858
51.0	J1B859
37.7	J1B860
26.3	J1B861
38.0	J1JVX2
28.0	J1B863
13.9	J1B864
7.81	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	28.4
Censored		Lognormal mean	31.5
Detection limit or PQL		Std. devn.	16.9
Method detection limit		Median	31.7
TOTAL	12	Min.	4.84
		Max.	51.9

Lognormal distribution? r-squared is: 0.859
Normal distribution? r-squared is: 0.935
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 37.1

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
18.0	J1B856/ J1B866
2.56	J1B854
2.84	J1B855
15.1	J1B857
16.5	J1B858
29.9	J1B859
21.9	J1B860
15.0	J1B861
25.0	J1JVX2
15.1	J1B863
6.44	J1B864
4.19	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	14.4
Censored		Lognormal mean	15.9
Detection limit or PQL		Std. devn.	8.89
Method detection limit		Median	15.1
TOTAL	12	Min.	2.56
		Max.	29.9

Lognormal distribution? r-squared is: 0.876
Normal distribution? r-squared is: 0.946
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 19.0

Chrysene 95% UCL Calculation

DATA	ID
32.0	J1B856/ J1B866
1.96	J1B854
4.04	J1B855
18.1	J1B857
12.8	J1B858
46.3	J1B859
37.2	J1B860
26.2	J1B861
36.0	J1JVX2
28.3	J1B863
6.53	J1B864
4.12	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	21.3
Censored		Lognormal mean	25.3
Detection limit or PQL		Std. devn.	15.1
Method detection limit		Median	22.2
TOTAL	12	Min.	1.96
		Max.	46.3

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.950
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 65.2

Dibenz(a,h)anthracene 95% UCL Calculation

DATA	ID
6.43	J1B856/ J1B866
1.66	J1B854
1.07	J1B855
6.87	J1B857
7.13	J1B858
9.75	J1B859
7.10	J1B860
4.31	J1B861
5.00	J1JVX2
5.26	J1B863
1.98	J1B864
1.26	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	4.82
Censored		Lognormal mean	5.17
Detection limit or PQL		Std. devn.	2.81
Method detection limit		Median	5.13
TOTAL	12	Min.	1.07
		Max.	9.75

Lognormal distribution? r-squared is: 0.864
Normal distribution? r-squared is: 0.937
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 6.28

Fluoranthene 95% UCL Calculation

DATA	ID
107	J1B856/ J1B866
1.66	J1B854
1.64	J1B855
65.7	J1B857
40.1	J1B858
179	J1B859
157	J1B860
99.7	J1B861
34.0	J1JVX2
59.0	J1B863
25.4	J1B864
17.1	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	65.6
Censored		Lognormal mean	115
Detection limit or PQL		Std. devn.	58.7
Method detection limit		Median	49.6
TOTAL	12	Min.	1.64
		Max.	179

Lognormal distribution? r-squared is: 0.857
Normal distribution? r-squared is: 0.916
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 96.0

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
31.7	J1B856/ J1B866
2.93	J1B854
5.17	J1B855
45.9	J1B857
48.1	J1B858
56.4	J1B859
40.4	J1B860
25.5	J1B861
38.0	J1JVX2
30.5	J1B863
5.93	J1B864
5.38	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	28.0
Censored		Lognormal mean	33.7
Detection limit or PQL		Std. devn.	19.0
Method detection limit		Median	31.1
TOTAL	12	Min.	2.93
		Max.	56.4

Lognormal distribution? r-squared is: 0.833
Normal distribution? r-squared is: 0.922
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 37.8

Phenanthrene 95% UCL Calculation

DATA	ID
42.4	J1B856/ J1B866
3.16	J1B854
2.79	J1B855
15.6	J1B857
12.0	J1B858
50.7	J1B859
57.1	J1B860
32.2	J1B861
14.0	J1JVX2
11.2	J1B863
7.07	J1B864
4.89	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	21.1
Censored		Lognormal mean	23.2
Detection limit or PQL		Std. devn.	19.4
Method detection limit		Median	13.0
TOTAL	12	Min.	2.79
		Max.	57.1

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.854
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 59.8

Pyrene 95% UCL Calculation

DATA	ID
97.8	J1B856/ J1B866
8.01	J1B854
9.80	J1B855
66.0	J1B857
40.5	J1B858
184	J1B859
141	J1B860
92.5	J1B861
58.0	J1JVX2
62.2	J1B863
27.2	J1B864
16.2	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	66.9
Censored		Lognormal mean	76.1
Detection limit or PQL		Std. devn.	54.3
Method detection limit		Median	60.1
TOTAL	12	Min.	8.01
		Max.	184

Lognormal distribution? r-squared is: 0.854
Normal distribution? r-squared is: 0.916
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 187

Ecology Software (MTCAStat) Results, Area B

Arsenic 95% UCL Calculation

DATA	ID
73.7	J1B887/ J1B892
39.5	J1B880
43.8	J1B881
45.1	J1B882
39.1	J1B883
24.8	J1B884
12.9	J1B885
14.2	J1B886
36.5	J1B888
47.6	J1B889
97.7	J1B890
16.0	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	40.9
Censored		Lognormal mean	42.0
Detection limit or PQL		Std. devn.	24.8
Method detection limit		Median	39.3
TOTAL	12	Min.	12.9
		Max.	97.7

Lognormal distribution? r-squared is: 0.942
Normal distribution? r-squared is: 0.884
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 65.3

Barium 95% UCL Calculation

DATA	ID
88.1	J1B887/ J1B892
73.9	J1B880
75.7	J1B881
80.2	J1B882
80.4	J1B883
86.1	J1B884
82.0	J1B885
78.3	J1B886
80.6	J1B888
78.3	J1B889
86.8	J1B890
113	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	83.3
Censored		Lognormal mean	83.3
Detection limit or PQL		Std. devn.	10.3
Method detection limit		Median	80.5
TOTAL	12	Min.	73.9
		Max.	113

Lognormal distribution? r-squared is: 0.749
Normal distribution? r-squared is: 0.691
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 88.2

Beryllium 95% UCL Calculation

DATA	ID
0.335	J1B887/ J1B892
0.281	J1B880
0.307	J1B881
0.334	J1B882
0.324	J1B883
0.336	J1B884
0.281	J1B885
0.351	J1B886
0.316	J1B888
0.281	J1B889
0.341	J1B890
0.380	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	0.322
Censored		Lognormal mean	0.322
Detection limit or PQL		Std. devn.	0.0307
Method detection limit		Median	0.329
TOTAL	12	Min.	0.281
		Max.	0.380

Lognormal distribution? r-squared is: 0.932
Normal distribution? r-squared is: 0.937
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.339

Boron 95% UCL Calculation

DATA	ID
3.13	J1B887/ J1B892
2.11	J1B880
2.17	J1B881
2.06	J1B882
2.01	J1B883
2.93	J1B884
3.51	J1B885
2.19	J1B886
2.52	J1B888
2.85	J1B889
2.37	J1B890
5.53	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	2.78
Censored		Lognormal mean	2.78
Detection limit or PQL		Std. devn.	0.989
Method detection limit		Median	2.45
TOTAL	12	Min.	2.01
		Max.	5.53

Lognormal distribution? r-squared is: 0.845
Normal distribution? r-squared is: 0.730
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.25

Cadmium 95% UCL Calculation

DATA	ID
0.127	J1B887/ J1B892
0.196	J1B880
0.112	J1B881
0.0850	J1B882
0.123	J1B883
0.143	J1B884
0.158	J1B885
0.105	J1B886
0.146	J1B888
0.124	J1B889
0.104	J1B890
0.161	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	0.132
Censored		Lognormal mean	0.132
Detection limit or PQL		Std. devn.	0.0305
Method detection limit		Median	0.126
TOTAL	12	Min.	0.0850
		Max.	0.196

Lognormal distribution? r-squared is: 0.983
Normal distribution? r-squared is: 0.963
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.151

Chromium 95% UCL Calculation

DATA	ID
14.2	J1B887/ J1B892
14.4	J1B880
13.5	J1B881
14.7	J1B882
14.5	J1B883
14.4	J1B884
13.0	J1B885
14.9	J1B886
13.2	J1B888
12.7	J1B889
13.9	J1B890
18.8	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	14.3
Censored		Lognormal mean	14.3
Detection limit or PQL		Std. devn.	1.57
Method detection limit		Median	14.3
TOTAL	12	Min.	12.7
		Max.	18.8

Lognormal distribution? r-squared is: 0.788
Normal distribution? r-squared is: 0.732
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 15.1

Cobalt 95% UCL Calculation

DATA	ID
6.67	J1B887/ J1B892
6.04	J1B880
6.22	J1B881
6.70	J1B882
6.68	J1B883
6.87	J1B884
6.02	J1B885
7.03	J1B886
6.81	J1B888
5.94	J1B889
6.81	J1B890
7.33	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	6.58
Censored		Lognormal mean	6.58
Detection limit or PQL		Std. devn.	0.435
Method detection limit		Median	6.67
TOTAL	12	Min.	5.94
		Max.	7.33

Lognormal distribution? r-squared is: 0.940
Normal distribution? r-squared is: 0.944
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.81

Copper 95% UCL Calculation

DATA	ID
11.7	J1B887/ J1B892
10.2	J1B880
10.7	J1B881
13.1	J1B882
12.2	J1B883
12.4	J1B884
13.0	J1B885
13.5	J1B886
11.3	J1B888
10.3	J1B889
11.8	J1B890
16.8	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	12.2
Censored		Lognormal mean	12.3
Detection limit or PQL		Std. devn.	1.80
Method detection limit		Median	12.0
TOTAL	12	Min.	10.2
		Max.	16.8

Lognormal distribution? r-squared is: 0.918
Normal distribution? r-squared is: 0.869
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.2

Lead 95% UCL Calculation

DATA	ID
167	J1B887/ J1B892
98.3	J1B880
43.8	J1B881
24.0	J1B882
48.3	J1B883
58.3	J1B884
166	J1B885
9.41	J1B886
178	J1B888
125	J1B889
95.7	J1B890
30.1	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	86.9
Censored		Lognormal mean	97.0
Detection limit or PQL		Std. devn.	60.2
Method detection limit		Median	77.0
TOTAL	12	Min.	9.41
		Max.	178

Lognormal distribution? r-squared is: 0.932
Normal distribution? r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 207

CALCULATION SHEET

Washington Closure Hanford

Originator	T. E. Queen	Date	07/13/11	Calc. No.	0100H-CA-V0178
Project	100-H Field Remediation	Job No.	14655	Checked	J. D. Skoglie
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations				

Rev. No. 0
Date 07/13/11
Sheet No. 32 of 49

Ecology Software (MTCAStat) Results, Area B

Manganese 95% UCL Calculation

DATA	ID
347	J1B887/J1B892
303	J1B880
315	J1B881
324	J1B882
335	J1B883
347	J1B884
296	J1B885
337	J1B886
341	J1B888
299	J1B889
354	J1B890
345	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	329
Censored		Lognormal mean	329
Detection limit or PQL		Std. devn.	20.5
Method detection limit		Median	336
TOTAL	12	Min.	296
		Max.	354

Lognormal distribution? r-squared is: 0.905
Normal distribution? r-squared is: 0.912
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 340

Molybdenum 95% UCL Calculation

DATA	ID
0.225	J1B887/J1B892
0.232	J1B880
0.289	J1B881
0.216	J1B882
0.224	J1B883
0.330	J1B884
0.230	J1B885
0.233	J1B886
0.228	J1B888
0.207	J1B889
0.220	J1B890
0.369	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	0.249
Censored		Lognormal mean	0.249
Detection limit or PQL		Std. devn.	0.0501
Method detection limit		Median	0.229
TOTAL	12	Min.	0.207
		Max.	0.369

Lognormal distribution? r-squared is: 0.748
Normal distribution? r-squared is: 0.704
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.272

Nickel 95% UCL Calculation

DATA	ID
11.1	J1B887/J1B892
10.5	J1B880
11.1	J1B881
12.1	J1B882
11.7	J1B883
11.8	J1B884
10.8	J1B885
12.9	J1B886
11.1	J1B888
10.4	J1B889
11.0	J1B890
14.0	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	11.5
Censored		Lognormal mean	11.5
Detection limit or PQL		Std. devn.	1.06
Method detection limit		Median	11.1
TOTAL	12	Min.	10.4
		Max.	14.0

Lognormal distribution? r-squared is: 0.898
Normal distribution? r-squared is: 0.874
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.0

Vanadium 95% UCL Calculation

DATA	ID
44.7	J1B887/J1B892
46.5	J1B880
42.8	J1B881
44.9	J1B882
44.9	J1B883
47.8	J1B884
46.8	J1B885
46.9	J1B886
44.0	J1B888
42.4	J1B889
44.5	J1B890
50.2	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	45.5
Censored		Lognormal mean	45.5
Detection limit or PQL		Std. devn.	2.21
Method detection limit		Median	44.9
TOTAL	12	Min.	42.4
		Max.	50.2

Lognormal distribution? r-squared is: 0.958
Normal distribution? r-squared is: 0.950
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 46.7

Zinc 95% UCL Calculation

DATA	ID
42.7	J1B887/J1B892
45.8	J1B880
38.6	J1B881
37.7	J1B882
41.1	J1B883
42.4	J1B884
42.2	J1B885
38.3	J1B886
41.8	J1B888
39.2	J1B889
44.5	J1B890
47.0	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	41.9
Censored		Lognormal mean	41.9
Detection limit or PQL		Std. devn.	2.89
Method detection limit		Median	42.0
TOTAL	12	Min.	37.7
		Max.	47.0

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.969
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 43.4

TPH - motor oil 95% UCL Calculation

DATA	ID
9095	J1B887/J1B892
57000	J1B880
8480	J1B881
6540	J1B882
5880	J1B883
10700	J1B884
8600	J1B885
4230	J1B886
13600	J1B888
13200	J1B889
5690	J1B890
26000	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	14101
Censored		Lognormal mean	13571
Detection limit or PQL		Std. devn.	14682
Method detection limit		Median	8848
TOTAL	12	Min.	4230
		Max.	57000

Lognormal distribution? r-squared is: 0.886
Normal distribution? r-squared is: 0.606
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 21073

Acenapthene 95% UCL Calculation

DATA	ID
1.54	J1B887/J1B892
1.66	J1B880
1.71	J1B881
1.68	J1B882
1.18	J1B883
1.34	J1B884
35.0	J1B885
1.65	J1B886
1.72	J1B888
178	J1B889
1.71	J1B890
15.8	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	20.2
Censored		Lognormal mean	13.6
Detection limit or PQL		Std. devn.	50.7
Method detection limit		Median	1.69
TOTAL	12	Min.	1.18
		Max.	178

Lognormal distribution? r-squared is: 0.858
Normal distribution? r-squared is: 0.409
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 44.3

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
7.48	J1B887/J1B892
2.97	J1B880
5.74	J1B881
3.52	J1B882
13.1	J1B883
15.9	J1B884
19.2	J1B885
1.65	J1B886
2.78	J1B888
14.8	J1B889
4.66	J1B890
14.4	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	8.85
Censored		Lognormal mean	9.42
Detection limit or PQL		Std. devn.	6.19
Method detection limit		Median	6.61
TOTAL	12	Min.	1.65
		Max.	19.2

Lognormal distribution? r-squared is: 0.937
Normal distribution? r-squared is: 0.903
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.1

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
9.62	J1B887/J1B892
3.83	J1B880
6.17	J1B881
2.86	J1B882
19.7	J1B883
24.1	J1B884
24.5	J1B885
1.65	J1B886
4.84	J1B888
18.7	J1B889
8.51	J1B890
17.2	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	11.8
Censored		Lognormal mean	12.9
Detection limit or PQL		Std. devn.	8.51
Method detection limit		Median	9.07
TOTAL	12	Min.	1.65
		Max.	24.5

Lognormal distribution? r-squared is: 0.942
Normal distribution? r-squared is: 0.912
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 27.4

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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Ecology Software (MTCAStat) Results, Area B

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID				
	J1B887/				
7.92	J1B892				
5.05	J1B880				
5.01	J1B881	Number of samples		Uncensored values	
2.27	J1B882	Uncensored	12	Mean	10.1
12.1	J1B883	Censored		Lognormal mean	11.0
17.8	J1B884	Detection limit or PQL		Std. devn.	7.27
20.4	J1B885	Method detection limit		Median	8.30
1.65	J1B886	TOTAL	12	Min.	1.65
3.0	J1B888			Max.	22.1
15.3	J1B889				
8.68	J1B890				
22.1	J1B891				

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.932
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 22.6

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID				
	J1B887/				
8.81	J1B892				
5.33	J1B880				
4.54	J1B881	Number of samples		Uncensored values	
2.00	J1B882	Uncensored	12	Mean	9.70
15.4	J1B883	Censored		Lognormal mean	10.6
18.2	J1B884	Detection limit or PQL		Std. devn.	6.38
20.8	J1B885	Method detection limit		Median	9.25
1.65	J1B886	TOTAL	12	Min.	1.65
4.32	J1B888			Max.	20.8
13.1	J1B889				
12.6	J1B890				
9.7	J1B891				

Lognormal distribution? r-squared is: 0.937
Normal distribution? r-squared is: 0.959
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 20.5

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID				
	J1B887/				
3.56	J1B892				
1.79	J1B880				
2.78	J1B881	Number of samples		Uncensored values	
1.30	J1B882	Uncensored	12	Mean	4.64
6.93	J1B883	Censored		Lognormal mean	4.81
8.72	J1B884	Detection limit or PQL		Std. devn.	3.09
9.91	J1B885	Method detection limit		Median	3.29
1.65	J1B886	TOTAL	12	Min.	1.30
1.87	J1B888			Max.	9.91
7.03	J1B889				
3.00	J1B890				
7.17	J1B891				

Lognormal distribution? r-squared is: 0.925
Normal distribution? r-squared is: 0.888
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 8.24

Chrysene 95% UCL Calculation

DATA	ID				
	J1B887/				
6.81	J1B892				
1.94	J1B880				
3.33	J1B881	Number of samples		Uncensored values	
2.02	J1B882	Uncensored	12	Mean	6.75
7.17	J1B883	Censored		Lognormal mean	7.24
7.31	J1B884	Detection limit or PQL		Std. devn.	6.55
9.79	J1B885	Method detection limit		Median	5.07
1.65	J1B886	TOTAL	12	Min.	0.861
0.861	J1B888			Max.	22.0
22.0	J1B889				
1.94	J1B890				
16.2	J1B891				

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.819
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 17.7

Dibenz(a,h)anthracene 95% UCL Calculation

DATA	ID				
	J1B887/				
1.66	J1B892				
1.06	J1B880				
1.71	J1B881	Number of samples		Uncensored values	
1.68	J1B882	Uncensored	12	Mean	2.01
2.34	J1B883	Censored		Lognormal mean	2.02
3.30	J1B884	Detection limit or PQL		Std. devn.	0.820
3.79	J1B885	Method detection limit		Median	1.71
1.65	J1B886	TOTAL	12	Min.	1.02
1.72	J1B888			Max.	3.79
1.97	J1B889				
1.02	J1B890				
2.18	J1B891				

Lognormal distribution? r-squared is: 0.930
Normal distribution? r-squared is: 0.864
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.55

Fluoranthene 95% UCL Calculation

DATA	ID				
	J1B887/				
22.9	J1B892				
9.63	J1B880				
8.03	J1B881	Number of samples		Uncensored values	
3.70	J1B882	Uncensored	12	Mean	23.6
19.6	J1B883	Censored		Lognormal mean	26.9
30.1	J1B884	Detection limit or PQL		Std. devn.	24.8
89.7	J1B885	Method detection limit		Median	15.5
1.65	J1B888	TOTAL	12	Min.	1.65
6.08	J1B888			Max.	89.7
37.0	J1B889				
11.4	J1B890				
43.4	J1B891				

Lognormal distribution? r-squared is: 0.987
Normal distribution? r-squared is: 0.788
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 79.4

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID				
	J1B887/				
7.16	J1B892				
2.04	J1B880				
5.13	J1B881	Number of samples		Uncensored values	
1.16	J1B882	Uncensored	12	Mean	8.63
15.1	J1B883	Censored		Lognormal mean	9.46
20.7	J1B884	Detection limit or PQL		Std. devn.	7.42
23.3	J1B885	Method detection limit		Median	6.38
1.65	J1B886	TOTAL	12	Min.	1.16
3.21	J1B888			Max.	23.3
9.68	J1B889				
8.84	J1B890				
5.60	J1B891				

Lognormal distribution? r-squared is: 0.976
Normal distribution? r-squared is: 0.881
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 22.2

Phenanthrene 95% UCL Calculation

DATA	ID				
	J1B887/				
7.38	J1B892				
5.81	J1B880				
2.73	J1B881	Number of samples		Uncensored values	
2.61	J1B882	Uncensored	12	Mean	10.6
9.95	J1B883	Censored		Lognormal mean	10.7
8.48	J1B884	Detection limit or PQL		Std. devn.	12.0
19.8	J1B885	Method detection limit		Median	6.60
1.65	J1B886	TOTAL	12	Min.	1.65
3.54	J1B888			Max.	44.5
44.5	J1B889				
4.69	J1B890				
16.2	J1B891				

Lognormal distribution? r-squared is: 0.979
Normal distribution? r-squared is: 0.698
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 24.2

Pyrene 95% UCL Calculation

DATA	ID				
	J1B887/				
18.8	J1B892				
18.5	J1B880				
14.4	J1B881	Number of samples		Uncensored values	
4.78	J1B882	Uncensored	12	Mean	23.3
31.0	J1B883	Censored		Lognormal mean	27.7
33.6	J1B884	Detection limit or PQL		Std. devn.	17.7
59.2	J1B885	Method detection limit		Median	18.6
1.65	J1B886	TOTAL	12	Min.	1.65
5.65	J1B888			Max.	59.2
40.7	J1B889				
10.7	J1B890				
40.5	J1B891				

Lognormal distribution? r-squared is: 0.930
Normal distribution? r-squared is: 0.941
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 72.9

CALCULATION SHEET

Washington Closure Hanford			
Originator T. E. Queen	**Date** 07/13/11	**Calc. No.** 0100H-CA-V0178	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** J. D. Skoglie	**Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 34 of 49

Ecology Software (MTCAStat) Results, Area C

Arsenic 95% UCL Calculation

DATA	ID
6.95	J1B8B0/ J1B8B5
3.92	J1B893
4.01	J1B894
3.41	J1B895
3.19	J1B896
3.65	J1B897
4.38	J1B8B1
2.50	J1B899
9.36	J1B898
18.6	J1B8B2
11.2	J1B8B3
15.6	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	7.23
Censored		Lognormal mean	7.27
Detection limit or PQL		Std. devn.	5.35
Method detection limit		Median	4.20
TOTAL	12	Min.	2.50
		Max.	18.6

Lognormal distribution? r-squared is: 0.912
Normal distribution? r-squared is: 0.815
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.7

Barium 95% UCL Calculation

DATA	ID
84.6	J1B8B0/ J1B8B5
126	J1B893
114	J1B894
89.2	J1B895
102	J1B896
97.9	J1B897
97.3	J1B8B1
50.9	J1B899
90.0	J1B898
102	J1B8B2
72.2	J1B8B3
77.5	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	92.0
Censored		Lognormal mean	92.3
Detection limit or PQL		Std. devn.	19.7
Method detection limit		Median	93.7
TOTAL	12	Min.	50.9
		Max.	126

Lognormal distribution? r-squared is: 0.909
Normal distribution? r-squared is: 0.966
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 106

Beryllium 95% UCL Calculation

DATA	ID
0.252	J1B8B0/ J1B8B5
0.270	J1B893
0.282	J1B894
0.299	J1B895
0.309	J1B896
0.318	J1B897
0.306	J1B8B1
0.213	J1B899
0.289	J1B898
0.292	J1B8B2
0.247	J1B8B3
0.296	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.281
Censored		Lognormal mean	0.281
Detection limit or PQL		Std. devn.	0.0305
Method detection limit		Median	0.291
TOTAL	12	Min.	0.213
		Max.	0.318

Lognormal distribution? r-squared is: 0.879
Normal distribution? r-squared is: 0.911
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 0.297

Boron 95% UCL Calculation

DATA	ID
2.85	J1B8B0/ J1B8B5
8.00	J1B893
7.13	J1B894
2.31	J1B895
2.83	J1B896
2.72	J1B897
3.76	J1B8B1
1.69	J1B899
3.47	J1B898
5.28	J1B8B2
2.02	J1B8B3
2.31	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	3.70
Censored		Lognormal mean	3.70
Detection limit or PQL		Std. devn.	2.04
Method detection limit		Median	2.84
TOTAL	12	Min.	1.69
		Max.	8.00

Lognormal distribution? r-squared is: 0.935
Normal distribution? r-squared is: 0.827
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.07

Cadmium 95% UCL Calculation

DATA	ID
0.124	J1B8B0/ J1B8B5
0.187	J1B893
0.159	J1B894
0.101	J1B895
0.130	J1B896
0.131	J1B897
0.148	J1B8B1
0.123	J1B899
0.130	J1B898
0.191	J1B8B2
0.111	J1B8B3
0.105	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.137
Censored		Lognormal mean	0.137
Detection limit or PQL		Std. devn.	0.0294
Method detection limit		Median	0.130
TOTAL	12	Min.	0.101
		Max.	0.191

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.908
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.153

Chromium 95% UCL Calculation

DATA	ID
12.5	J1B8B0/ J1B8B5
11.6	J1B893
12.4	J1B894
12.6	J1B895
13.6	J1B896
12.3	J1B897
12.4	J1B8B1
12.9	J1B899
14.3	J1B898
15.8	J1B8B2
12.6	J1B8B3
13.4	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	13.0
Censored		Lognormal mean	13.0
Detection limit or PQL		Std. devn.	1.12
Method detection limit		Median	12.6
TOTAL	12	Min.	11.6
		Max.	15.8

Lognormal distribution? r-squared is: 0.868
Normal distribution? r-squared is: 0.841
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.6

Cobalt 95% UCL Calculation

DATA	ID
6.08	J1B8B0/ J1B8B5
6.06	J1B893
6.13	J1B894
6.89	J1B895
7.65	J1B896
7.10	J1B897
7.21	J1B8B1
5.87	J1B899
6.38	J1B898
5.17	J1B8B2
5.09	J1B8B3
6.17	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	6.32
Censored		Lognormal mean	6.32
Detection limit or PQL		Std. devn.	0.782
Method detection limit		Median	6.15
TOTAL	12	Min.	5.09
		Max.	7.65

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.959
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.76

Copper 95% UCL Calculation

DATA	ID
13.0	J1B8B0/ J1B8B5
14.4	J1B893
12.8	J1B894
13.1	J1B895
15.0	J1B896
13.3	J1B897
13.3	J1B8B1
15.5	J1B899
13.8	J1B898
11.9	J1B8B2
8.93	J1B8B3
12.2	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	13.1
Censored		Lognormal mean	13.1
Detection limit or PQL		Std. devn.	1.69
Method detection limit		Median	13.2
TOTAL	12	Min.	8.93
		Max.	15.5

Lognormal distribution? r-squared is: 0.829
Normal distribution? r-squared is: 0.880
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.9

Hexavalent chromium 95% UCL Calculation

DATA	ID
0.16	J1B8B0/ J1B8B5
0.18	J1B893
0.16	J1B894
0.11	J1B895
0.14	J1B896
0.19	J1B897
0.11	J1B8B1
0.18	J1B899
0.16	J1B898
0.11	J1B8B2
0.10	J1B8B3
0.10	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.14
Censored		Lognormal mean	0.14
Detection limit or PQL		Std. devn.	0.034
Method detection limit		Median	0.15
TOTAL	12	Min.	0.10
		Max.	0.19

Lognormal distribution? r-squared is: 0.888
Normal distribution? r-squared is: 0.896
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.16

CALCULATION SHEET

Washington Closure Hanford
Originator: T. E. Queen
Project: 100-H Field Remediation
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date: 07/13/11
Job No.: 14656

Calc. No.: 0100H-CA-V0178
Checked: J. D. Skoglie

Rev. No.: 0
Date: 07/13/11

Ecology Software (MTCAStat) Results, Area C

Lead 95% UCL Calculation

DATA	ID
16.9	J1B8B0/ J1B8B5
21.2	J1B893
18.8	J1B894
4.99	J1B895
4.78	J1B896
5.69	J1B897
13.1	J1B8B1
5.07	J1B899
37.9	J1B898
198	J1B8B2
32.0	J1B8B3
43.6	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	33.5
Censored		Lognormal mean	32.1
Detection limit or PQL		Std. devn.	53.5
Method detection limit		Median	17.9
TOTAL	12	Min.	4.78
		Max.	198

Lognormal distribution? r-squared is: 0.914
Normal distribution? r-squared is: 0.520
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 93.3

Manganese 95% UCL Calculation

DATA	ID
278	J1B8B0/ J1B8B5
270	J1B893
270	J1B894
290	J1B895
320	J1B896
314	J1B897
326	J1B8B1
235	J1B899
305	J1B898
250	J1B8B2
249	J1B8B3
287	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	283
Censored		Lognormal mean	283
Detection limit or PQL		Std. devn.	29.6
Method detection limit		Median	283
TOTAL	12	Min.	235
		Max.	326

Lognormal distribution? r-squared is: 0.971
Normal distribution? r-squared is: 0.974
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 299

Molybdenum 95% UCL Calculation

DATA	ID
0.294	J1B8B0/ J1B8B5
0.434	J1B893
0.367	J1B894
0.298	J1B895
0.325	J1B896
0.301	J1B897
0.345	J1B8B1
0.354	J1B899
0.331	J1B898
0.299	J1B8B2
0.249	J1B8B3
0.237	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.319
Censored		Lognormal mean	0.320
Detection limit or PQL		Std. devn.	0.0531
Method detection limit		Median	0.313
TOTAL	12	Min.	0.237
		Max.	0.434

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.948
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.350

Nickel 95% UCL Calculation

DATA	ID
9.98	J1B8B0/ J1B8B5
10.0	J1B893
10.8	J1B894
12.4	J1B895
14.3	J1B896
12.8	J1B897
11.5	J1B8B1
17.6	J1B899
11.2	J1B898
9.53	J1B8B2
9.64	J1B8B3
11.0	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	11.7
Censored		Lognormal mean	11.7
Detection limit or PQL		Std. devn.	2.32
Method detection limit		Median	11.1
TOTAL	12	Min.	9.53
		Max.	17.6

Lognormal distribution? r-squared is: 0.887
Normal distribution? r-squared is: 0.826
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.8

Vanadium 95% UCL Calculation

DATA	ID
46.4	J1B8B0/ J1B8B5
46.4	J1B893
40.6	J1B894
41.3	J1B895
49.8	J1B896
43.3	J1B897
47.7	J1B8B1
44.3	J1B899
50.1	J1B898
38.1	J1B8B2
36.4	J1B8B3
42.1	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	43.9
Censored		Lognormal mean	43.9
Detection limit or PQL		Std. devn.	4.36
Method detection limit		Median	43.8
TOTAL	12	Min.	36.4
		Max.	50.1

Lognormal distribution? r-squared is: 0.976
Normal distribution? r-squared is: 0.981
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 46.3

Zinc 95% UCL Calculation

DATA	ID
39.35	J1B8B0/ J1B8B5
44.2	J1B893
43.4	J1B894
40.1	J1B895
44.9	J1B896
44.6	J1B897
47.3	J1B8B1
39.4	J1B899
41.9	J1B898
44.8	J1B8B2
35.6	J1B8B3
38.8	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	42.0
Censored		Lognormal mean	42.0
Detection limit or PQL		Std. devn.	3.39
Method detection limit		Median	42.7
TOTAL	12	Min.	35.6
		Max.	47.3

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.951
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 43.9

TPH - motor oil 95% UCL Calculation

DATA	ID
10365	J1B8B0/ J1B8B5
36400	J1B893
29500	J1B894
5100	J1B895
5050	J1B896
13400	J1B897
4060	J1B8B1
5000	J1B899
17200	J1B898
18500	J1B8B2
5430	J1B8B3
16000	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	13834
Censored		Lognormal mean	14233
Detection limit or PQL		Std. devn.	10455
Method detection limit		Median	11883
TOTAL	12	Min.	4060
		Max.	36400

Lognormal distribution? r-squared is: 0.922
Normal distribution? r-squared is: 0.858
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 25289

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
44.3	J1B8B0/ J1B8B5
13.4	J1B893
3.14	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
129	J1B898
31.1	J1B8B2
15.0	J1B8B3
11.9	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	21.4
Censored		Lognormal mean	23.6
Detection limit or PQL		Std. devn.	36.5
Method detection limit		Median	7.52
TOTAL	12	Min.	1.58
		Max.	129

Lognormal distribution? r-squared is: 0.880
Normal distribution? r-squared is: 0.584
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 38.7

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
27.5	J1B8B0/ J1B8B5
11.1	J1B893
2.48	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
179	J1B898
46.6	J1B8B2
14.3	J1B8B3
12.6	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	25.2
Censored		Lognormal mean	25.5
Detection limit or PQL		Std. devn.	50.3
Method detection limit		Median	6.79
TOTAL	12	Min.	1.58
		Max.	179

Lognormal distribution? r-squared is: 0.867
Normal distribution? r-squared is: 0.502
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 49.1

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 38 of 49

Ecology Software (MTCAStat) Results, Area C

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
	J1B8B0/
45.1	J1B8B5
4.24	J1B893
3.47	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
190	J1B898
47.3	J1B8B2
10.7	J1B8B3
11.7	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	26.7
Censored		Lognormal mean	25.9
Detection limit or PQL		Std. devn.	54.0
Method detection limit		Median	3.86
TOTAL	12	Min.	1.58
		Max.	190

Lognormal distribution? r-squared is: 0.858
Normal distribution? r-squared is: 0.509
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 52.4

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
	J1B8B0/
14.9	J1B8B5
90.1	J1B893
1.82	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
116	J1B898
34.3	J1B8B2
10.6	J1B8B3
8.93	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	23.8
Censored		Lognormal mean	26.8
Detection limit or PQL		Std. devn.	38.6
Method detection limit		Median	5.38
TOTAL	12	Min.	1.58
		Max.	116

Lognormal distribution? r-squared is: 0.844
Normal distribution? r-squared is: 0.640
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 42.1

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
	J1B8B0/
14.0	J1B8B5
6.89	J1B893
1.65	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
86.3	J1B898
17.8	J1B8B2
5.55	J1B8B3
5.35	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	12.1
Censored		Lognormal mean	10.5
Detection limit or PQL		Std. devn.	23.9
Method detection limit		Median	3.57
TOTAL	12	Min.	1.58
		Max.	86.3

Lognormal distribution? r-squared is: 0.825
Normal distribution? r-squared is: 0.467
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 23.5

Chrysene 95% UCL Calculation

DATA	ID
	J1B8B0/
54.1	J1B8B5
19.4	J1B893
22.7	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
99.9	J1B898
30.3	J1B8B2
8.18	J1B8B3
8.66	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	21.0
Censored		Lognormal mean	25.9
Detection limit or PQL		Std. devn.	29.5
Method detection limit		Median	8.42
TOTAL	12	Min.	1.58
		Max.	99.9

Lognormal distribution? r-squared is: 0.892
Normal distribution? r-squared is: 0.706
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 35.0

Fluoranthene 95% UCL Calculation

DATA	ID
	J1B8B0/
135	J1B8B5
11.0	J1B893
14.7	J1B894
1.67	J1B895
1.69	J1B896
2.19	J1B897
11.0	J1B8B1
1.58	J1B899
149	J1B898
100	J1B8B2
29.4	J1B8B3
24.5	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	40.1
Censored		Lognormal mean	57.9
Detection limit or PQL		Std. devn.	54.8
Method detection limit		Median	12.9
TOTAL	12	Min.	1.58
		Max.	149

Lognormal distribution? r-squared is: 0.919
Normal distribution? r-squared is: 0.726
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 561

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
	J1B8B0/
11.9	J1B8B5
9.19	J1B893
7.44	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
121	J1B898
35.3	J1B8B2
14.7	J1B8B3
10.9	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	18.2
Censored		Lognormal mean	18.1
Detection limit or PQL		Std. devn.	33.7
Method detection limit		Median	8.32
TOTAL	12	Min.	1.58
		Max.	121

Lognormal distribution? r-squared is: 0.882
Normal distribution? r-squared is: 0.512
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 34.3

Phenanthrene 95% UCL Calculation

DATA	ID
	J1B8B0/
27.4	J1B8B5
26.5	J1B893
9.26	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
19.3	J1B898
33.3	J1B8B2
9.70	J1B8B3
8.97	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	11.9
Censored		Lognormal mean	14.2
Detection limit or PQL		Std. devn.	11.7
Method detection limit		Median	9.12
TOTAL	12	Min.	1.58
		Max.	33.3

Lognormal distribution? r-squared is: 0.853
Normal distribution? r-squared is: 0.844
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 17.5

Pyrene 95% UCL Calculation

DATA	ID
	J1B8B0/
93.5	J1B8B5
35.5	J1B893
6.12	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
262	J1B898
104	J1B8B2
33.3	J1B8B3
30.5	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	47.8
Censored		Lognormal mean	77.2
Detection limit or PQL		Std. devn.	76.4
Method detection limit		Median	18.3
TOTAL	12	Min.	1.58
		Max.	262

Lognormal distribution? r-squared is: 0.872
Normal distribution? r-squared is: 0.653
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 84.0

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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Ecology Software (MTCAStat) Results, Area D

Arsenic 95% UCL Calculation

DATA	ID
	J1B8C0/
3.30	J1B8C8
3.46	J1B8B6
3.14	J1B8B7
3.31	J1B8B8
2.75	J1B8B9
2.96	J1B8C1
2.78	J1B8C2
2.26	J1B8C3
3.57	J1B8C4
6.68	J1B8C5
10.7	J1B8C6
3.80	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	4.06
Censored		Lognormal mean	4.01
Detection limit or PQL		Std. devn.	2.36
Method detection limit		Median	3.31
TOTAL	12	Min.	2.26
		Max.	10.7

Lognormal distribution? r-squared is: 0.775
Normal distribution? r-squared is: 0.822
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 5.18

Barium 95% UCL Calculation

DATA	ID
	J1B8C0/
99.8	J1B8C8
98.7	J1B8B6
105	J1B8B7
91.4	J1B8B8
71.4	J1B8B9
76.5	J1B8C1
85.7	J1B8C2
58.1	J1B8C3
85.1	J1B8C4
107	J1B8C5
97.2	J1B8C6
61.4	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	86.4
Censored		Lognormal mean	86.7
Detection limit or PQL		Std. devn.	16.5
Method detection limit		Median	88.6
TOTAL	12	Min.	58.1
		Max.	107

Lognormal distribution? r-squared is: 0.920
Normal distribution? r-squared is: 0.947
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 97.1

Beryllium 95% UCL Calculation

DATA	ID
	J1B8C0/
0.391	J1B8C8
0.338	J1B8B6
0.240	J1B8B7
0.301	J1B8B8
0.263	J1B8B9
0.211	J1B8C1
0.279	J1B8C2
0.205	J1B8C3
0.328	J1B8C4
0.272	J1B8C5
0.290	J1B8C6
0.245	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.280
Censored		Lognormal mean	0.281
Detection limit or PQL		Std. devn.	0.0539
Method detection limit		Median	0.276
TOTAL	12	Min.	0.205
		Max.	0.391

Lognormal distribution? r-squared is: 0.987
Normal distribution? r-squared is: 0.971
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.312

Boron 95% UCL Calculation

DATA	ID
	J1B8C0/
2.23	J1B8C8
3.53	J1B8B6
7.11	J1B8B7
3.26	J1B8B8
2.21	J1B8B9
3.42	J1B8C1
1.99	J1B8C2
1.61	J1B8C3
1.91	J1B8C4
6.91	J1B8C5
4.12	J1B8C6
1.91	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	3.35
Censored		Lognormal mean	3.36
Detection limit or PQL		Std. devn.	1.88
Method detection limit		Median	2.75
TOTAL	12	Min.	1.61
		Max.	7.11

Lognormal distribution? r-squared is: 0.908
Normal distribution? r-squared is: 0.806
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.63

Cadmium 95% UCL Calculation

DATA	ID
	J1B8C0/
0.134	J1B8C8
0.129	J1B8B6
0.191	J1B8B7
0.108	J1B8B8
0.153	J1B8B9
0.144	J1B8C1
0.129	J1B8C2
0.123	J1B8C3
0.146	J1B8C4
0.227	J1B8C5
0.140	J1B8C6
0.119	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.145
Censored		Lognormal mean	0.145
Detection limit or PQL		Std. devn.	0.0332
Method detection limit		Median	0.137
TOTAL	12	Min.	0.108
		Max.	0.227

Lognormal distribution? r-squared is: 0.891
Normal distribution? r-squared is: 0.820
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.161

Chromium 95% UCL Calculation

DATA	ID
	J1B8C0/
15.1	J1B8C8
14.5	J1B8B6
11.3	J1B8B7
13.3	J1B8B8
14.6	J1B8B9
12.9	J1B8C1
12.2	J1B8C2
12.1	J1B8C3
13.4	J1B8C4
12.5	J1B8C5
16.4	J1B8C6
14.7	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	13.6
Censored		Lognormal mean	13.6
Detection limit or PQL		Std. devn.	1.49
Method detection limit		Median	13.4
TOTAL	12	Min.	11.3
		Max.	16.4

Lognormal distribution? r-squared is: 0.976
Normal distribution? r-squared is: 0.970
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.4

Cobalt 95% UCL Calculation

DATA	ID
	J1B8C0/
7.56	J1B8C8
6.81	J1B8B6
5.14	J1B8B7
6.26	J1B8B8
7.05	J1B8B9
5.82	J1B8C1
7.10	J1B8C2
6.34	J1B8C3
6.59	J1B8C4
6.10	J1B8C5
6.13	J1B8C6
6.26	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	6.43
Censored		Lognormal mean	6.43
Detection limit or PQL		Std. devn.	0.645
Method detection limit		Median	6.30
TOTAL	12	Min.	5.14
		Max.	7.56

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.966
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.79

Copper 95% UCL Calculation

DATA	ID
	J1B8C0/
13.4	J1B8C8
12.1	J1B8B6
12.6	J1B8B7
12.0	J1B8B8
13.6	J1B8B9
13.7	J1B8C1
12.3	J1B8C2
11.7	J1B8C3
10.9	J1B8C4
17.4	J1B8C5
13.8	J1B8C6
12.5	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	13.0
Censored		Lognormal mean	13.0
Detection limit or PQL		Std. devn.	1.65
Method detection limit		Median	12.6
TOTAL	12	Min.	10.9
		Max.	17.4

Lognormal distribution? r-squared is: 0.868
Normal distribution? r-squared is: 0.812
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.8

Hexavalent chromium 95% UCL Calculation

DATA	ID
	J1B8C0/
0.11	J1B8C8
0.16	J1B8B6
0.11	J1B8B7
0.10	J1B8B8
0.11	J1B8B9
0.070	J1B8C1
0.14	J1B8C2
0.16	J1B8C3
0.18	J1B8C4
0.090	J1B8C5
0.12	J1B8C6
0.17	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.13
Censored		Lognormal mean	0.13
Detection limit or PQL		Std. devn.	0.035
Method detection limit		Median	0.11
TOTAL	12	Min.	0.070
		Max.	0.18

Lognormal distribution? r-squared is: 0.946
Normal distribution? r-squared is: 0.941
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.15

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 38 of 49

Ecology Software (MTCAStat) Results, Area D

Lead 95% UCL Calculation

DATA	ID
	J1B8C0/
5.06	J1B8C8
3.75	J1B8B6
19.9	J1B8B7
4.08	J1B8B8
6.90	J1B8B9
19.6	J1B8C1
4.90	J1B8C2
4.67	J1B8C3
5.13	J1B8C4
74.9	J1B8C5
44.4	J1B8C6
14.4	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	17.3
Censored		Lognormal mean	16.9
Detection limit or PQL		Std. devn.	21.6
Method detection limit		Median	6.02
TOTAL	12	Min.	3.75
		Max.	74.9

Lognormal distribution? r-squared is: 0.866
Normal distribution? r-squared is: 0.688
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 27.6

Manganese 95% UCL Calculation

DATA	ID
	J1B8C0/
372	J1B8C8
326	J1B8B6
222	J1B8B7
284	J1B8B8
310	J1B8B9
267	J1B8C1
333	J1B8C2
282	J1B8C3
343	J1B8C4
275	J1B8C5
277	J1B8C6
284	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	298
Censored		Lognormal mean	298
Detection limit or PQL		Std. devn.	40.4
Method detection limit		Median	284
TOTAL	12	Min.	222
		Max.	372

Lognormal distribution? r-squared is: 0.942
Normal distribution? r-squared is: 0.949
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 321

Mercury 95% UCL Calculation

DATA	ID
	J1B8C0/
0.015	J1B8C8
0.014	J1B8B6
1.07	J1B8B7
0.013	J1B8B8
0.020	J1B8B9
0.035	J1B8C1
0.012	J1B8C2
0.010	J1B8C3
0.015	J1B8C4
0.048	J1B8C5
0.0080	J1B8C6
0.015	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.11
Censored		Lognormal mean	0.054
Detection limit or PQL		Std. devn.	0.30
Method detection limit		Median	0.015
TOTAL	12	Min.	0.0080
		Max.	1.07

Lognormal distribution? r-squared is: 0.634
Normal distribution? r-squared is: NA
Recommendations:
Reject BOTH lognormal and normal distributions.
Unable to analyze probability plot for normal case.

UCL (based on Z-statistic) is 0.25

Molybdenum 95% UCL Calculation

DATA	ID
	J1B8C0/
0.327	J1B8C8
0.288	J1B8B6
0.315	J1B8B7
0.242	J1B8B8
0.524	J1B8B9
0.389	J1B8C1
0.327	J1B8C2
0.427	J1B8C3
0.329	J1B8C4
0.481	J1B8C5
0.459	J1B8C6
0.302	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.368
Censored		Lognormal mean	0.368
Detection limit or PQL		Std. devn.	0.0872
Method detection limit		Median	0.328
TOTAL	12	Min.	0.242
		Max.	0.524

Lognormal distribution? r-squared is: 0.957
Normal distribution? r-squared is: 0.938
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.420

Nickel 95% UCL Calculation

DATA	ID
	J1B8C0/
13.2	J1B8C8
11.8	J1B8B6
9.9	J1B8B7
11.2	J1B8B8
11.5	J1B8B9
11.1	J1B8C1
10.0	J1B8C2
10.5	J1B8C3
11.2	J1B8C4
10.4	J1B8C5
12.3	J1B8C6
10.5	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	11.1
Censored		Lognormal mean	11.1
Detection limit or PQL		Std. devn.	0.96
Method detection limit		Median	11.2
TOTAL	12	Min.	9.91
		Max.	13.2

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.946
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.6

Vanadium 95% UCL Calculation

DATA	ID
	J1B8C0/
48.4	J1B8C8
41.7	J1B8B6
39.4	J1B8B7
39.8	J1B8B8
58.4	J1B8B9
48.4	J1B8C1
52.5	J1B8C2
58.2	J1B8C3
43.0	J1B8C4
49.4	J1B8C5
45.7	J1B8C6
50.2	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	47.9
Censored		Lognormal mean	48.0
Detection limit or PQL		Std. devn.	6.40
Method detection limit		Median	48.4
TOTAL	12	Min.	39.4
		Max.	58.4

Lognormal distribution? r-squared is: 0.961
Normal distribution? r-squared is: 0.953
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 51.5

Zinc 95% UCL Calculation

DATA	ID
	J1B8C0/
43.2	J1B8C8
42.6	J1B8B6
38.7	J1B8B7
37.0	J1B8B8
40.7	J1B8B9
36.9	J1B8C1
39.5	J1B8C2
36.3	J1B8C3
39.9	J1B8C4
42.8	J1B8C5
38.5	J1B8C6
36.5	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	39.4
Censored		Lognormal mean	39.4
Detection limit or PQL		Std. devn.	2.51
Method detection limit		Median	39.1
TOTAL	12	Min.	36.3
		Max.	43.2

Lognormal distribution? r-squared is: 0.938
Normal distribution? r-squared is: 0.934
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 40.7

TPH - motor oil 95% UCL Calculation

DATA	ID
	J1B8C0/
5163	J1B8C8
4950	J1B8B6
29300	J1B8B7
6970	J1B8B8
4970	J1B8B9
3590	J1B8C1
4800	J1B8C2
6810	J1B8C3
5100	J1B8C4
25100	J1B8C5
66700	J1B8C6
6450	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	14159
Censored		Lognormal mean	13133
Detection limit or PQL		Std. devn.	18601
Method detection limit		Median	5806
TOTAL	12	Min.	3590
		Max.	66700

Lognormal distribution? r-squared is: 0.766
Normal distribution? r-squared is: 0.584
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 22992

Acenapthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
19.4	J1B8B7
1.86	J1B8B8
1.79	J1B8B9
2.31	J1B8C1
9.82	J1B8C2
1.68	J1B8C3
1.72	J1B8C4
15.6	J1B8C5
34.0	J1B8C6
2.87	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	7.85
Censored		Lognormal mean	7.72
Detection limit or PQL		Std. devn.	10.3
Method detection limit		Median	2.05
TOTAL	12	Min.	1.64
		Max.	34.0

Lognormal distribution? r-squared is: 0.780
Normal distribution? r-squared is: 0.681
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.7

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178, 0
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 39 of 49

Ecology Software (MTCAStat) Results, Area D

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
22.6	J1B8B7
1.84	J1B8B8
1.79	J1B8B9
2.59	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
6.21	J1B8C4
5.09	J1B8C5
19.1	J1B8C6
2.65	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	5.72
Censored		Lognormal mean	5.37
Detection limit or PQL		Std. devn.	7.26
Method detection limit		Median	2.22
TOTAL	12	Min.	1.64
		Max.	22.6

Lognormal distribution? Normal distribution?
r-squared is: 0.779 r-squared is: 0.617
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 9.16

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
11.0	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
3.52	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
7.91	J1B8C4
8.22	J1B8C5
24.3	J1B8C6
1.59	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	5.56
Censored		Lognormal mean	5.40
Detection limit or PQL		Std. devn.	6.76
Method detection limit		Median	1.75
TOTAL	12	Min.	1.59
		Max.	24.3

Lognormal distribution? Normal distribution?
r-squared is: 0.786 r-squared is: 0.647
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 8.77

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
14.3	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
5.39	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
4.75	J1B8C4
9.58	J1B8C5
27.9	J1B8C6
1.59	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	6.14
Censored		Lognormal mean	5.91
Detection limit or PQL		Std. devn.	7.94
Method detection limit		Median	1.75
TOTAL	12	Min.	1.59
		Max.	27.9

Lognormal distribution? Normal distribution?
r-squared is: 0.793 r-squared is: 0.643
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 9.91

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
7.96	J1B8B7
1.66	J1B8B8
1.06	J1B8B9
2.97	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
4.56	J1B8C4
6.44	J1B8C5
15.9	J1B8C6
1.28	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	4.05
Censored		Lognormal mean	3.96
Detection limit or PQL		Std. devn.	4.35
Method detection limit		Median	1.70
TOTAL	12	Min.	1.06
		Max.	15.9

Lognormal distribution? Normal distribution?
r-squared is: 0.874 r-squared is: 0.685
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 6.11

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
4.7	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
1.78	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
2.75	J1B8C4
3.34	J1B8C5
9.49	J1B8C6
0.93	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	2.76
Censored		Lognormal mean	2.70
Detection limit or PQL		Std. devn.	2.35
Method detection limit		Median	1.745
TOTAL	12	Min.	0.93
		Max.	9.49

Lognormal distribution? Normal distribution?
r-squared is: 0.828 r-squared is: 0.627
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.88

Fluoranthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
42.4	J1B8B7
2.49	J1B8B8
5.19	J1B8B9
28.2	J1B8C1
2.20	J1B8C2
27.3	J1B8C3
16.0	J1B8C4
27.6	J1B8C5
57.3	J1B8C6
3.35	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	17.9
Censored		Lognormal mean	22.4
Detection limit or PQL		Std. devn.	18.7
Method detection limit		Median	10.6
TOTAL	12	Min.	1.64
		Max.	57.3

Lognormal distribution? Normal distribution?
r-squared is: 0.895 r-squared is: 0.847
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 26.8

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
1.69	J1B8B7
4.76	J1B8B8
2.33	J1B8B9
2.00	J1B8C1
2.01	J1B8C2
1.68	J1B8C3
4.68	J1B8C4
4.19	J1B8C5
13.7	J1B8C6
1.67	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	3.50
Censored		Lognormal mean	3.37
Detection limit or PQL		Std. devn.	3.44
Method detection limit		Median	2.01
TOTAL	12	Min.	1.64
		Max.	13.7

Lognormal distribution? Normal distribution?
r-squared is: 0.770 r-squared is: 0.571
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 5.14

Phenanthrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
25.7	J1B8B7
2.15	J1B8B8
0.97	J1B8B9
5.45	J1B8C1
1.02	J1B8C2
1.68	J1B8C3
5.68	J1B8C4
9.15	J1B8C5
19.5	J1B8C6
1.12	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	6.31
Censored		Lognormal mean	6.37
Detection limit or PQL		Std. devn.	8.11
Method detection limit		Median	1.93
TOTAL	12	Min.	0.97
		Max.	25.7

Lognormal distribution? Normal distribution?
r-squared is: 0.899 r-squared is: 0.700
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 10.2

Pyrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
5.66	J1B8B7
1.69	J1B8B8
1.09	J1B8B9
6.77	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
12.6	J1B8C4
16.3	J1B8C5
58.6	J1B8C6
2.95	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	9.36
Censored		Lognormal mean	8.56
Detection limit or PQL		Std. devn.	16.3
Method detection limit		Median	2.33
TOTAL	12	Min.	1.09
		Max.	58.6

Lognormal distribution? Normal distribution?
r-squared is: 0.865 r-squared is: 0.528
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 17.1

CALCULATION SHEET

Washington Closure Hanford
Originator: T. E. Queen
Project: 100-H Field Remediation
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date: 07/13/11
Job No.: 14655

Calc. No.: 0100H-CA-V0178
Checked: J. D. Skoglie

Rev. No.: 0
Date: 07/13/11

Ecology Software (MTCAStat) Results, Area E

Arsenic 95% UCL Calculation

DATA	ID
6.0	J1JCT4/J1JCV1
3.7	J1JCR9
2.2	J1JCT0
2.5	J1JCT1
1.7	J1JCT2
4.1	J1JCT3
3.1	J1JCT5
2.9	J1JCT6
2.7	J1JCT7
4.5	J1JCT8
2.5	J1JCT9
1.7	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	3.1
Censored		Lognormal mean	3.1
Detection limit or PQL		Std. devn.	1.2
Method detection limit		Median	2.8
TOTAL	12	Min.	1.7
		Max.	6.0

Lognormal distribution? r-squared is: 0.975
Normal distribution? r-squared is: 0.915
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.0

Barium 95% UCL Calculation

DATA	ID
88.0	J1JCT4/J1JCV1
60.7	J1JCR9
51.4	J1JCT0
71.2	J1JCT1
49.7	J1JCT2
52.6	J1JCT3
52.6	J1JCT5
70.7	J1JCT6
49.8	J1JCT7
74.0	J1JCT8
41.8	J1JCT9
43.6	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	58.8
Censored		Lognormal mean	58.9
Detection limit or PQL		Std. devn.	14.2
Method detection limit		Median	52.6
TOTAL	12	Min.	41.6
		Max.	88.0

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.911
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 67.1

Boron 95% UCL Calculation

DATA	ID
2.8	J1JCT4/J1JCV1
1.1	J1JCR9
1.0	J1JCT0
1.3	J1JCT1
0.48	J1JCT2
0.43	J1JCT3
0.47	J1JCT5
1.3	J1JCT6
0.47	J1JCT7
1.6	J1JCT8
0.47	J1JCT9
0.50	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	0.98
Censored		Lognormal mean	0.99
Detection limit or PQL		Std. devn.	0.70
Method detection limit		Median	0.74
TOTAL	12	Min.	0.43
		Max.	2.8

Lognormal distribution? r-squared is: 0.865
Normal distribution? r-squared is: 0.784
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.3

Cadmium 95% UCL Calculation

DATA	ID
0.11	J1JCT4/J1JCV1
0.083	J1JCR9
0.064	J1JCT0
0.086	J1JCT1
0.041	J1JCT2
0.041	J1JCT3
0.048	J1JCT5
0.076	J1JCT6
0.020	J1JCT7
0.083	J1JCT8
0.042	J1JCT9
0.045	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	0.060
Censored		Lognormal mean	0.061
Detection limit or PQL		Std. devn.	0.025
Method detection limit		Median	0.056
TOTAL	12	Min.	0.020
		Max.	0.11

Lognormal distribution? r-squared is: 0.930
Normal distribution? r-squared is: 0.950
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.082

Chromium 95% UCL Calculation

DATA	ID
13.0	J1JCT4/J1JCV1
11.0	J1JCR9
16.5	J1JCT0
10.7	J1JCT1
9.7	J1JCT2
9.4	J1JCT3
10.8	J1JCT5
13.3	J1JCT6
11.0	J1JCT7
11.8	J1JCT8
12.8	J1JCT9
9.6	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	11.6
Censored		Lognormal mean	11.6
Detection limit or PQL		Std. devn.	2.0
Method detection limit		Median	11.0
TOTAL	12	Min.	9.4
		Max.	16.5

Lognormal distribution? r-squared is: 0.925
Normal distribution? r-squared is: 0.881
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 12.7

Cobalt 95% UCL Calculation

DATA	ID
6.9	J1JCT4/J1JCV1
6.9	J1JCR9
5.9	J1JCT0
7.6	J1JCT1
5.8	J1JCT2
5.1	J1JCT3
5.2	J1JCT5
6.3	J1JCT6
5.7	J1JCT7
5.8	J1JCT8
5.6	J1JCT9
6.6	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	6.1
Censored		Lognormal mean	6.1
Detection limit or PQL		Std. devn.	0.75
Method detection limit		Median	5.9
TOTAL	12	Min.	5.1
		Max.	7.6

Lognormal distribution? r-squared is: 0.965
Normal distribution? r-squared is: 0.952
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.5

Copper 95% UCL Calculation

DATA	ID
13.2	J1JCT4/J1JCV1
15.9	J1JCR9
15.0	J1JCT0
17.4	J1JCT1
13.6	J1JCT2
21.9	J1JCT3
14.2	J1JCT5
13.1	J1JCT6
14.5	J1JCT7
10.7	J1JCT8
16.1	J1JCT9
15.9	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	15.1
Censored		Lognormal mean	15.1
Detection limit or PQL		Std. devn.	2.77
Method detection limit		Median	14.8
TOTAL	12	Min.	10.7
		Max.	21.9

Lognormal distribution? r-squared is: 0.933
Normal distribution? r-squared is: 0.891
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 16.7

Lead 95% UCL Calculation

DATA	ID
5.6	J1JCT4/J1JCV1
3.0	J1JCR9
4.9	J1JCT0
4.2	J1JCT1
2.6	J1JCT2
6.5	J1JCT3
8.1	J1JCT5
4.9	J1JCT6
4.5	J1JCT7
11.6	J1JCT8
3.2	J1JCT9
2.8	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	5.2
Censored		Lognormal mean	5.2
Detection limit or PQL		Std. devn.	2.6
Method detection limit		Median	4.7
TOTAL	12	Min.	2.6
		Max.	11.6

Lognormal distribution? r-squared is: 0.958
Normal distribution? r-squared is: 0.847
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.9

Manganese 95% UCL Calculation

DATA	ID
317	J1JCT4/J1JCV1
284	J1JCR9
230	J1JCT0
331	J1JCT1
225	J1JCT2
203	J1JCT3
197	J1JCT5
266	J1JCT6
201	J1JCT7
251	J1JCT8
212	J1JCT9
236	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	246
Censored		Lognormal mean	246
Detection limit or PQL		Std. devn.	45.1
Method detection limit		Median	233
TOTAL	12	Min.	197
		Max.	331

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.918
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 271

CALCULATION SHEET

Washington Closure Hanford

Originator	T. E. Queen	Date	07/13/11
Project	100-H Field Remediation	Job No.	14655
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations		
Calc. No.	0100H-CA-V0178	Rev. No.	0
Checked	J. D. Skoglie	Date	07/13/11
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Ecology Software (MTCAStat) Results, Area E

Mercury 95% UCL Calculation

DATA	ID				
	J1JCT4/				
0.041	J1JCV1				
0.0029	J1JCR9				
0.0054	J1JCT0	Number of samples		Uncensored values	
0.0063	J1JCT1	Uncensored	12	Mean	0.0078
0.0072	J1JCT2	Censored		Lognormal mean	0.0071
0.0028	J1JCT3	Detection limit or PQL		Std. devn.	0.011
0.011	J1JCT5	Method detection limit		Median	0.0041
0.0025	J1JCT6	TOTAL	12	Min.	0.0025
0.0027	J1JCT7			Max.	0.041
0.0027	J1JCT8				
0.0062	J1JCT9				
0.0028	J1JCV0				

Lognormal distribution? r-squared is: 0.796
Normal distribution? r-squared is: 0.496
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.013

Nickel 95% UCL Calculation

DATA	ID				
	J1JCT4/				
11.6	J1JCV1				
10.6	J1JCR9				
13.6	J1JCT0	Number of samples		Uncensored values	
11.9	J1JCT1	Uncensored	12	Mean	10.8
9.1	J1JCT2	Censored		Lognormal mean	10.8
9.9	J1JCT3	Detection limit or PQL		Std. devn.	1.3
9.4	J1JCT5	Method detection limit		Median	10.6
12.3	J1JCT6	TOTAL	12	Min.	9.1
10.2	J1JCT7			Max.	13.6
10.6	J1JCT8				
11.0	J1JCT9				
9.8	J1JCV0				

Lognormal distribution? r-squared is: 0.975
Normal distribution? r-squared is: 0.955
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.5

Vanadium 95% UCL Calculation

DATA	ID				
	J1JCT4/				
37.0	J1JCV1				
46.6	J1JCR9				
38.1	J1JCT0	Number of samples		Uncensored values	
41.8	J1JCT1	Uncensored	12	Mean	38.8
37.8	J1JCT2	Censored		Lognormal mean	38.8
36.0	J1JCT3	Detection limit or PQL		Std. devn.	3.8
36.3	J1JCT5	Method detection limit		Median	37.6
35.6	J1JCT6	TOTAL	12	Min.	33.8
41.0	J1JCT7			Max.	46.6
33.8	J1JCT8				
37.3	J1JCT9				
44.0	J1JCV0				

Lognormal distribution? r-squared is: 0.933
Normal distribution? r-squared is: 0.915
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 40.8

Zinc 95% UCL Calculation

DATA	ID				
	J1JCT4/				
40.1	J1JCV1				
35.1	J1JCR9				
34.0	J1JCT0	Number of samples		Uncensored values	
37.5	J1JCT1	Uncensored	12	Mean	34.3
29.8	J1JCT2	Censored		Lognormal mean	34.3
30.9	J1JCT3	Detection limit or PQL		Std. devn.	3.4
31.8	J1JCT5	Method detection limit		Median	34.1
39.0	J1JCT6	TOTAL	12	Min.	29.8
31.5	J1JCT7			Max.	40.1
34.1	J1JCT8				
31.2	J1JCT9				
37.0	J1JCV0				

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.940
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 36.2

TPH - motor oil 95% UCL Calculation

DATA	ID				
	J1JCT4/				
1045	J1JCV1				
550	J1JCR9				
380000	J1JCT0	Number of samples		Uncensored values	
500	J1JCT1	Uncensored	12	Mean	33590
12000	J1JCT2	Censored		Lognormal mean	11949
2700	J1JCT3	Detection limit or PQL		Std. devn.	109138
1900	J1JCT5	Method detection limit		Median	1023
500	J1JCT6	TOTAL	12	Min.	480
480	J1JCT7			Max.	380000
1900	J1JCT8				
1000	J1JCT9				
500	J1JCV0				

Lognormal distribution? r-squared is: 0.703
Normal distribution? r-squared is: NA
Recommendations:
Reject BOTH lognormal and normal distributions. Unable to analyze probability plot for normal case.
UCL (based on Z-statistic) is 85416

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID				
	J1JCT4/				
71	J1JCV1				
26	J1JCR9				
23	J1JCT0	Number of samples		Uncensored values	
76	J1JCT1	Uncensored	12	Mean	65
74	J1JCT2	Censored		Lognormal mean	67
70	J1JCT3	Detection limit or PQL		Std. devn.	19
77	J1JCT5	Method detection limit		Median	73
74	J1JCT6	TOTAL	12	Min.	23
75	J1JCT7			Max.	77
69	J1JCT8				
74	J1JCT9				
72	J1JCV0				

Lognormal distribution? r-squared is: 0.539
Normal distribution? r-squared is: 0.581
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 74

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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Ecology Software (MTCAStat) Results, 128-H-1 Area F

Arsenic 95% UCL Calculation

DATA	ID
3.9	J1JCV3/ J1JCW4
3.8	J1JCV2
3.4	J1JCV4
3.4	J1JCV5
4.0	J1JCV6
4.1	J1JCV7
3.3	J1JCV8
3.4	J1JCV9
3.4	J1JCW0
3.4	J1JCW1
3.2	J1JCW2
3.6	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	3.6
Censored		Lognormal mean	3.6
Detection limit or PQL		Std. devn.	0.30
Method detection limit		Median	3.4
TOTAL	12	Min.	3.2
		Max.	4.1

Lognormal distribution? r-squared is: 0.890
Normal distribution? r-squared is: 0.881
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.7

Barium 95% UCL Calculation

DATA	ID
91.4	J1JCV3/ J1JCW4
84.3	J1JCV2
84.9	J1JCV4
93.9	J1JCV5
89.1	J1JCV6
97.6	J1JCV7
96.7	J1JCV8
74.3	J1JCV9
72.6	J1JCW0
67.3	J1JCW1
64.7	J1JCW2
88.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	83.8
Censored		Lognormal mean	83.9
Detection limit or PQL		Std. devn.	11.4
Method detection limit		Median	86.9
TOTAL	12	Min.	64.7
		Max.	97.6

Lognormal distribution? r-squared is: 0.915
Normal distribution? r-squared is: 0.932
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 90.6

Beryllium 95% UCL Calculation

DATA	ID
0.27	J1JCV3/ J1JCW4
0.25	J1JCV2
0.27	J1JCV4
0.26	J1JCV5
0.28	J1JCV6
0.29	J1JCV7
0.28	J1JCV8
0.23	J1JCV9
0.24	J1JCW0
0.22	J1JCW1
0.17	J1JCW2
0.29	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	0.25
Censored		Lognormal mean	0.25
Detection limit or PQL		Std. devn.	0.035
Method detection limit		Median	0.27
TOTAL	12	Min.	0.17
		Max.	0.29

Lognormal distribution? r-squared is: 0.828
Normal distribution? r-squared is: 0.881
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.27

Boron 95% UCL Calculation

DATA	ID
2.1	J1JCV3/ J1JCW4
1.5	J1JCV2
1.4	J1JCV4
1.9	J1JCV5
1.4	J1JCV6
1.6	J1JCV7
1.6	J1JCV8
1.4	J1JCV9
1.5	J1JCW0
1.8	J1JCW1
1.3	J1JCW2
1.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	1.6
Censored		Lognormal mean	1.6
Detection limit or PQL		Std. devn.	0.24
Method detection limit		Median	1.6
TOTAL	12	Min.	1.3
		Max.	2.1

Lognormal distribution? r-squared is: 0.938
Normal distribution? r-squared is: 0.923
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.7

Cadmium 95% UCL Calculation

DATA	ID
0.089	J1JCV3/ J1JCW4
0.083	J1JCV2
0.082	J1JCV4
0.11	J1JCV5
0.070	J1JCV6
0.094	J1JCV7
0.097	J1JCV8
0.080	J1JCV9
0.076	J1JCW0
0.086	J1JCW1
0.069	J1JCW2
0.085	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	0.085
Censored		Lognormal mean	0.085
Detection limit or PQL		Std. devn.	0.012
Method detection limit		Median	0.084
TOTAL	12	Min.	0.069
		Max.	0.11

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.092

Chromium 95% UCL Calculation

DATA	ID
12.5	J1JCV3/ J1JCW4
12.6	J1JCV2
15.2	J1JCV4
12.5	J1JCV5
12.4	J1JCV6
15.0	J1JCV7
12.5	J1JCV8
11.7	J1JCV9
11.8	J1JCW0
18.0	J1JCW1
9.3	J1JCW2
12.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	13.0
Censored		Lognormal mean	13.0
Detection limit or PQL		Std. devn.	2.2
Method detection limit		Median	12.5
TOTAL	12	Min.	9.3
		Max.	18.0

Lognormal distribution? r-squared is: 0.877
Normal distribution? r-squared is: 0.857
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 14.1

Cobalt 95% UCL Calculation

DATA	ID
7.0	J1JCV3/ J1JCW4
7.1	J1JCV2
7.1	J1JCV4
7.0	J1JCV5
7.4	J1JCV6
7.4	J1JCV7
7.6	J1JCV8
6.8	J1JCV9
7.0	J1JCW0
7.2	J1JCW1
6.4	J1JCW2
7.7	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	7.1
Censored		Lognormal mean	7.1
Detection limit or PQL		Std. devn.	0.36
Method detection limit		Median	7.1
TOTAL	12	Min.	6.4
		Max.	7.7

Lognormal distribution? r-squared is: 0.953
Normal distribution? r-squared is: 0.960
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 7.3

Copper 95% UCL Calculation

DATA	ID
12.8	J1JCV3/ J1JCW4
14.0	J1JCV2
14.1	J1JCV4
11.6	J1JCV5
13.8	J1JCV6
13.2	J1JCV7
13.4	J1JCV8
15.0	J1JCV9
14.1	J1JCW0
17.3	J1JCW1
15.1	J1JCW2
14.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	14.1
Censored		Lognormal mean	14.1
Detection limit or PQL		Std. devn.	1.42
Method detection limit		Median	14.1
TOTAL	12	Min.	11.6
		Max.	17.3

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.931
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.9

Lead 95% UCL Calculation

DATA	ID
5.3	J1JCV3/ J1JCW4
6.7	J1JCV2
5.5	J1JCV4
5.4	J1JCV5
5.6	J1JCV6
5.7	J1JCV7
5.8	J1JCV8
5.3	J1JCV9
5.5	J1JCW0
5.3	J1JCW1
3.9	J1JCW2
6.1	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	5.5
Censored		Lognormal mean	5.5
Detection limit or PQL		Std. devn.	0.65
Method detection limit		Median	5.5
TOTAL	12	Min.	3.9
		Max.	6.7

Lognormal distribution? r-squared is: 0.777
Normal distribution? r-squared is: 0.825
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 5.8

CALCULATION SHEET

Washington Closure Hanford TQ

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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Ecology Software (MTCAStat) Results, 128-H-1 Area F

Manganese 95% UCL Calculation

DATA	ID
	J1JCV3/
330	J1JCW4
315	J1JCV2
309	J1JCV4
342	J1JCV5
326	J1JCV6
359	J1JCV7
351	J1JCV8
305	J1JCV9
297	J1JCW0
291	J1JCW1
250	J1JCW2
342	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	318
Censored		Lognormal mean	318
Detection limit or PQL		Std. devn.	30.4
Method detection limit		Median	321
TOTAL	12	Min.	250
		Max.	359

Lognormal distribution? r-squared is: 0.917
Normal distribution? r-squared is: 0.945
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 336

Nickel 95% UCL Calculation

DATA	ID
	J1JCV3/
12.2	J1JCW4
12.8	J1JCV2
13.9	J1JCV4
11.4	J1JCV5
12.6	J1JCV6
14.3	J1JCV7
12.4	J1JCV8
12.3	J1JCV9
12.4	J1JCW0
14.9	J1JCW1
10.6	J1JCW2
13.2	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	12.7
Censored		Lognormal mean	12.8
Detection limit or PQL		Std. devn.	1.2
Method detection limit		Median	12.5
TOTAL	12	Min.	10.6
		Max.	14.9

Lognormal distribution? r-squared is: 0.965
Normal distribution? r-squared is: 0.964
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.4

Vanadium 95% UCL Calculation

DATA	ID
	J1JCV3/
38.0	J1JCW4
38.5	J1JCV2
38.6	J1JCV4
38.7	J1JCV5
40.0	J1JCV6
40.4	J1JCV7
41.7	J1JCV8
41.0	J1JCV9
40.1	J1JCW0
42.0	J1JCW1
40.1	J1JCW2
41.2	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	40.0
Censored		Lognormal mean	40.0
Detection limit or PQL		Std. devn.	1.3
Method detection limit		Median	40.1
TOTAL	12	Min.	38.0
		Max.	42.0

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 40.7

Zinc 95% UCL Calculation

DATA	ID
	J1JCV3/
40.1	J1JCW4
38.8	J1JCV2
39.0	J1JCV4
41.9	J1JCV5
39.6	J1JCV6
43.8	J1JCV7
42.0	J1JCV8
37.8	J1JCV9
37.6	J1JCW0
38.4	J1JCW1
33.0	J1JCW2
41.6	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	39.5
Censored		Lognormal mean	39.5
Detection limit or PQL		Std. devn.	2.8
Method detection limit		Median	39.3
TOTAL	12	Min.	33.0
		Max.	43.8

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.923
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 41.0

TPH - diesel range 95% UCL Calculation

DATA	ID
	J1JCV3/
338	J1JCW4
650	J1JCV2
345	J1JCV4
350	J1JCV5
330	J1JCV6
345	J1JCV7
345	J1JCV8
11000	J1JCV9
4300	J1JCW0
2800	J1JCW1
24000	J1JCW2
4600	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	4117
Censored		Lognormal mean	4448
Detection limit or PQL		Std. devn.	7021
Method detection limit		Median	500
TOTAL	12	Min.	330
		Max.	24000

Lognormal distribution? r-squared is: 0.820
Normal distribution? r-squared is: 0.604
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 7451

TPH - motor oil 95% UCL Calculation

DATA	ID
	J1JCV3/
1150	J1JCW4
1400	J1JCV2
1200	J1JCV4
1100	J1JCV5
1400	J1JCV6
1000	J1JCV7
500	J1JCV8
26000	J1JCV9
7500	J1JCW0
7600	J1JCW1
25000	J1JCW2
8400	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	6854
Censored		Lognormal mean	7451
Detection limit or PQL		Std. devn.	9200
Method detection limit		Median	1400
TOTAL	12	Min.	500
		Max.	26000

Lognormal distribution? r-squared is: 0.876
Normal distribution? r-squared is: 0.690
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 11223

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
	J1JCV3/
50	J1JCW4
23	J1JCV2
77	J1JCV4
74	J1JCV5
71	J1JCV6
73	J1JCV7
66	J1JCV8
23	J1JCV9
23	J1JCW0
23	J1JCW1
22	J1JCW2
23	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	46
Censored		Lognormal mean	46
Detection limit or PQL		Std. devn.	25
Method detection limit		Median	36
TOTAL	12	Min.	22
		Max.	77

Lognormal distribution? r-squared is: 0.768
Normal distribution? r-squared is: 0.785
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 57

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen **Date** 07/13/11 **Calc. No.** 0100H-CA-V0178 **Rev. No.** 0

Project 100-H Field Remediation **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 44 of 49

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	8910		16.7	46.1		0.835	75.3		0.420	0.262		0.167	2.71		1.67	0.088	B	0.21	3410		16.7	12.2		0.840	5.83		2.51
Duplicate of J1B856	J1B866	6/30/10	9250		15.7	46.6		0.784	84.5		0.390	0.276		0.157	2.85		1.57	0.086	B	0.20	3390		15.7	12.0		0.780	6.11		2.35

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	3.7%		11.5%				0.6%	1.7%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	13.1		1.67	16500		16.7	139		0.835	3510		4.18	302		0.835	0.338	B	0.835	10.4		2.09	1720		83.5	647		5.01
Duplicate of J1B856	J1B866	6/30/10	13.6		1.57	16500		15.7	137		0.784	3440		3.92	301		0.784	0.283	B	0.784	10.7		1.96	1790		78.4	1090		4.71

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon
TDL		1	5	5	75	5	2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)
	RPD	3.7%	0.0%	1.4%	2.0%	0.3%				*51.0%*
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc			TPH - motor oil			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	197		41.8	36.9		0.835	43.9		2.51	21100		10100	4.22		3.38	32.7		3.38	47.1		3.38	30.2		3.38	28.6		3.38
Duplicate of J1B856	J1B866	6/30/10	215		39.2	38.6		0.784	44.1		2.35	31400		10000	3.51		3.34	32.4		3.34	75.7		3.34	43.8		3.34	44.3		3.34

Analysis:

		Sodium	Vanadium	Zinc	TPH - motor oil	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene
TDL		50	2.5	1	5000	15	15	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD		4.5%	0.5%						
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	Yes - assess further	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	HEIS Number	Sample Date	Benzo(k)fluoranthene			Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene			Fluoranthene (SVOA)			Pyrene (SVOA)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	14.9		3.38	5.19		3.38	99.3		3.38	2.87	J	3.38	16.9		3.38	50.0		3.38	96.4		3.38	145	J	145	209	J	319
Duplicate of J1B856	J1B866	6/30/10	32.0		3.34	7.67		3.34	114		3.34	2.51	J	3.34	46.4		3.34	34.8		3.34	99.2		3.34	57.0	J	327	58.3	J	327

Analysis:

		Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoranthene (SVOA)	Pyrene (SVOA)
TDL		15	15	15	15	15	15	15	660	660
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)		
	RPD			13.8%				2.9%		
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen — Date 07/13/11 — Calc. No. 0100H-CA-V0178 — Rev. No. 0

Project 100-H Field Remediation — Job No. 14655 — Checked J. D. Skoglie — Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 45 of 49

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	Sample Number	Sample Date	Aluminum mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL
B8	J1B887	6/29/10	11000		14.9	71.1		0.744	84.1		0.370	0.332		0.149	3.04		1.49
Duplicate of J1B892	J1B892	6/29/10	11200		15.2	76.2		0.762	88.1		0.380	0.338		0.152	3.21		1.52

Sampling Area	Sample Number	Sample Date	Cadmium mg/kg	Q	PQL	Calcium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL
B8	J1B887	6/29/10	0.130	B	0.190	4090		14.9	14.0		0.740	6.75		2.23
Duplicate of J1B892	J1B892	6/29/10	0.124	B	0.190	4220		15.2	14.3		0.760	6.58		2.29

Analysis:

Duplicate Analysis	Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL	5	10	2	0.2	2	0.2	100	1	2
Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
RPD	1.8%	6.9%	4.6%				3.1%	2.1%	
Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	HEIS Number	Sample Date	Copper mg/kg	Q	PQL	Iron mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Magnesium mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
B8	J1B887	6/29/10	11.3		1.49	19900		14.9	124		0.744	4220		3.72	342		0.744
Duplicate of J1B892	J1B892	6/29/10	12.0		1.52	20100		15.2	209		0.762	4220		3.81	351		0.762

Sampling Area	HEIS Number	Sample Date	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Potassium mg/kg	Q	PQL	Silicon mg/kg	Q	PQL
B8	J1B887	6/29/10	0.217	B	0.744	11.1		1.86	2290		74.4	1450		4.47
Duplicate of J1B892	J1B892	6/29/10	0.233	B	0.762	11.1		1.91	2370		76.2	1360		4.57

Analysis:

Duplicate Analysis	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon
TDL	1	5	5	75	5	2	4	400	2
Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
RPD	6.0%	1.0%	51.1%	0.0%	2.6%			3.4%	6.4%
Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	HEIS Number	Sample Date	Sodium mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	TPH - motor oil ug/kg	Q	PQL	Benzo(a)anthracene ug/kg	Q	PQL
B8	J1B887	6/29/10	217		37.2	44.4		0.744	41.9		2.23	9720	J	10300	10.9		3.44
Duplicate of J1B892	J1B892	6/29/10	231		38.1	44.9		0.762	43.5		2.29	8470	J	10200	4.06		3.38

Sampling Area	HEIS Number	Sample Date	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL	Benzo(ghi)perylene ug/kg	Q	PQL	Benzo(k)fluoranthene ug/kg	Q	PQL
B8	J1B887	6/29/10	12.9		3.44	10.5		3.44	9.60		3.44	4.85		3.44
Duplicate of J1B892	J1B892	6/29/10	6.34		3.38	5.33		3.38	8.01		3.38	2.30	J	3.38

Analysis:

Duplicate Analysis	Sodium	Vanadium	Zinc	TPH - motor oil	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene
TDL	50	2.5	1	5000	15	15	15	15	15
Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	
RPD		1.1%	3.7%						
Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	HEIS Number	Sample Date	Chrysene ug/kg	Q	PQL	Fluoranthene ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL
B8	J1B887	6/29/10	9.67		3.44	35.6		3.44	10.1		3.44	10.7		3.44	25.6		3.44
Duplicate of J1B892	J1B892	6/29/10	2.30	J	3.38	10.1		3.38	4.21		3.38	4.06		3.38	11.9		3.38

Analysis:

Duplicate Analysis	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
TDL	15	15	15	15	15
Both > PQL?	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
Both >5xTDL?		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
RPD					
Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen | Date 07/13/11 | Calc. No. 0100H-CA-V0178 | Rev. No. 0

Project 100-H Field Remediation | Job No. 14655 | Checked J. D. Skoglie | Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 46 of 49

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
C8	J1B8B0	6/29/10	8650		13.6	6.90		0.680	83.9		0.340	0.254		0.136	3.15		1.36	0.118	B	0.170	4140		13.6	12.8	J	0.680	6.06		2.03
Duplicate of J1B8B0	J1B8B5	6/29/10	8570		13.8	7.00		0.688	85.2		0.340	0.250		0.138	2.55		1.38	0.129	B	0.170	4080		13.8	12.1	J	0.690	6.06		2.06

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	0.9%		1.5%				1.5%	5.6%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	HEIS Number	Sample Date	Copper			Hexavalent chromium			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
C8	J1B8B0	6/29/10	14.0		1.36	0.14	B	0.20	17800		13.6	16.3		0.678	4370	J	3.39	276		0.68	0.301	B	0.678	9.96	J	1.70	1610		67.8
Duplicate of J1B8B0	J1B8B5	6/29/10	11.9		1.38	0.18	B	0.20	17900		13.8	17.5		0.688	4350	J	3.44	280		0.69	0.286	B	0.688	10.0	J	1.72	1620		68.8

Analysis:

		Copper	Hexavalent chromium	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium
TDL		1	0.5	5	5	75	5	2	4	400
Duplicate Analysis	Both > PQL?	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)		Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)
	RPD	16.2%		0.6%		0.5%	1.4%			
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	HEIS Number	Sample Date	Silicon			Sodium			Vanadium			Zinc			TPH - motor oil			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
C8	J1B8B0	6/29/10	1080	J	4.07	233		33.9	46.2	J	0.678	38.5		2.03	9130	J	9710	85.7	J	3.29	50.8	J	3.29	85.1	J	3.29	26.6	J	3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	1100	J	4.13	244		34.4	46.6	J	0.688	40.2		2.06	11600	J	9920	2.89	J	3.30	4.18	J	3.30	5.00	J	3.30	3.27	J	3.30

Analysis:

		Silicon	Sodium	Vanadium	Zinc	TPH - motor oil	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene
TDL		2	50	2.5	1	5000	15	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)			No-Stop (acceptable)	No-Stop (acceptable)	
	RPD	1.8%		0.9%	4.3%					
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	Yes - assess further	Yes - assess further	Yes - assess further	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	HEIS Number	Sample Date	Benzo(k)fluoranthene			Chrysene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
C8	J1B8B0	6/29/10	26.2		3.29	105	J	3.29	261	J	3.29	22.5	J	3.29	50.3		3.29	181	J	3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	1.87	J	3.30	3.29	J	3.30	8.59	J	3.30	1.39	J	3.30	4.46		3.30	5.95	J	3.30

Analysis:

		Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
TDL		15	15	15	15	15	15
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)
	Both >5xTDL?			No-Stop (acceptable)		No-Stop (acceptable)	No-Stop (acceptable)
	RPD						
	Difference > 2 TDL?	No - acceptable	Yes - assess further	Yes - assess further	No - acceptable	Yes - assess further	Yes - assess further

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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Sheet No. 47 of 49

Duplicate Analysis - 128-H-1 Waste Site Area D

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	12700		15.9	3.31		0.793	98.6		0.400	0.385		0.159	2.26		1.59	0.137	B	0.200	3970		15.9	15.0	J	0.793	7.44		2.38
Duplicate of J1B8C0	J1B8C8	6/29/10	12900		15.0	3.29		0.749	101		0.370	0.396		0.150	2.20		1.50	0.130	B	0.190	4010		15.0	15.2	J	0.749	7.67		2.25

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	1.6%		2.4%				1.0%	1.3%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area D

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	13.3		1.59	22500		15.9	5.03		0.793	5040	J	3.96	369		0.793	0.352	B	0.793	13.0	J	1.98	2220		79.3	1490	J	4.76
Duplicate of J1B8C0	J1B8C8	6/29/10	13.4		1.50	22700		15.0	5.09		0.749	5070	J	3.74	374		0.749	0.302	B	0.749	13.3	J	1.87	2280		74.9	1410	J	4.49

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon
TDL		1	5	5	75	5	2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	0.7%	0.9%		0.6%	1.3%			2.7%	5.5%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area D

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	267		39.6	47.8	J	0.793	42.5		2.38
Duplicate of J1B8C0	J1B8C8	6/29/10	277		37.4	49.0	J	0.749	43.9		2.25

Analysis:

		Sodium	Vanadium	Zinc
TDL		50	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)
	RPD	3.7%	2.5%	3.2%
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen | Date 07/13/11 | Calc. No. 0100H-CA-V0178 | Rev. No. 0

Project 100-H Field Remediation | Job No. 14655 | Checked J. D. Skoglie | Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 48 of 49

Duplicate Analysis - 128-H-1 Waste Site Area E

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-6	J1JCT4	5/31/11	9290		1.3	5.9		0.57	88.2		0.065	0.16	B	0.028
Duplicate of J1JCT4	J1JCV1	5/31/11	9810		1.5	6.0		0.64	87.8		0.074	0.17	B	0.032

Sampling Area	Sample Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-6	J1JCT4	5/31/11	2.8		0.84	0.11	B	0.035	3300		12.1	12.4		0.050	6.8		0.086
Duplicate of J1JCT4	J1JCV1	5/31/11	2.7		0.95	0.11	B	0.040	3340		13.7	13.5		0.056	6.9		0.097

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	5.4%		0.5%				1.2%	8.5%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area E

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-6	J1JCT4	5/31/11	13.2	X	0.19	16700		3.3	5.7		0.23	4260		3.2
Duplicate of J1JCT4	J1JCV1	5/31/11	13.2	X	0.21	17300		3.7	5.4		0.26	4380		3.6

Sampling Area	HEIS Number	Sample Date	Manganese			Mercury			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-6	J1JCT4	5/31/11	324		0.086	0.0076	B	0.0053	11.4		0.11	2720		35.3	99.9		4.9
Duplicate of J1JCT4	J1JCV1	5/31/11	310		0.097	0.074		0.0057	11.7		0.12	2790		39.8	215		5.5

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silicon
TDL		1	5	5	75	5	0.2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	0.0%	3.5%		2.8%	4.4%			2.5%	73.1%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area E

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc			Bis(2-ethylhexyl)phthalate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
E-6	J1JCT4	5/31/11	217		50.7	35.9		0.081	39.6	X	0.34	76	JB	47
Duplicate of J1JCT4	J1JCV1	5/31/11	214		57.2	38.0		0.091	40.5	X	0.39	66	JB	45

Analysis:

		Sodium	Vanadium	Zinc	Bis(2-ethylhexyl)phthalate
TDL		50	2.5	1	660
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD		5.7%	2.2%	
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen — Date 07/13/11 — Calc. No. 0100H-CA-V0178 — Rev. No. 0
Project 100-H Field Remediation — Job No. 14655 — Checked J. D. Skoglie — Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 49 of 49

Duplicate Analysis - 128-H-1 Waste Site Area F

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	10200		1.5	3.9		0.65	93.4		0.075	0.27		0.033	2.1		0.97	0.091	B	0.041	3930		14.0	12.2		0.057	7.0	X	0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	10100		1.5	3.9		0.66	89.4		0.076	0.27		0.033	2.0		0.98	0.087	B	0.041	3850		14.1	12.7		0.058	6.9	X	0.10

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	1.0%		4.4%				2.1%	4.0%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area F

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Nickel			Potassium			Silicon			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	12.5		0.21	19800		3.8	5.4		0.27	4600		3.7	330		0.099	11.9		0.12	2040		40.6	317		5.6	197		58.4
Duplicate of J1JCV3	J1JCW4	5/26/11	13.0		0.22	19600		3.8	5.2		0.27	4710		3.7	329		0.10	12.4		0.12	2070		40.9	289		5.6	195		58.8

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Silicon	Sodium
TDL		1	5	5	75	5	4	400	2	50
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	3.9%	1.0%		2.4%	0.3%		1.5%	9.2%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area F

Sampling Area	HEIS Number	Sample Date	Vanadium			Zinc			TPH - motor oil		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
F-2	J1JCV3	5/26/11	38.1		0.093	39.8		0.39	1100	J	1000
Duplicate of J1JCV3	J1JCW4	5/26/11	37.8		0.094	40.3		0.40	1200	J	960

Analysis:

		Vanadium	Zinc	TPH - motor oil
TDL		2.5	1	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	0.8%	1.2%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	8910		16.7	0.835	U	0.835	46.1		0.835	75.3		0.42	0.262		0.167
Duplicate of J1B856	J1B866	6/30/10	9250		15.7	0.784	U	0.784	46.6		0.784	84.5		0.39	0.276		0.157
A1	J1B854	6/30/10	8070		17.5	0.874	U	0.874	15.1		0.874	70.0		0.44	0.219		0.175
A2	J1B855	6/30/10	10400		16.9	0.844	U	0.844	23.5		0.844	79.5		0.42	0.302		0.169
A4	J1B857	6/30/10	9350		16.4	0.820	U	0.820	56.8		0.820	81.6		0.41	0.276		0.164
A5	J1B858	6/30/10	9360		17.4	0.870	U	0.870	31.8		0.870	69.0		0.44	0.271		0.174
A6	J1B859	6/30/10	9300		17.1	0.855	U	0.855	42.4		0.855	77.8		0.43	0.275		0.171
A7	J1B860	6/30/10	8400		16.9	0.845	U	0.845	29.7		0.845	79.1		0.42	0.241		0.169
A8	J1B861	6/30/10	8940		16.8	0.839	U	0.839	33.8		0.839	83.7		0.42	0.253		0.168
A9	J1B862	6/30/10	9080		13.4	0.669	U	0.669	25.0		0.669	81.7		0.34	0.264		0.134
A-9[a]	J1JVX2	6/16/11	9060		1.40	0.350	U	0.350	40.5		0.350	80.1		0.070	0.210		0.031
A10	J1B863	6/30/10	10800		19.0	0.949	U	0.949	47.6		0.949	85.5		0.47	0.321		0.190
A11	J1B864	6/30/10	7060		13.6	0.678	U	0.678	16.5		0.678	72.1		0.34	0.200		0.136
A12	J1B865	6/30/10	8230		16.4	0.822	U	0.822	17.3		0.822	105		0.41	0.184		0.164
B8	J1B887	6/29/10	11000		14.9	0.744	U	0.744	71.1		0.744	84.1		0.37	0.332		0.149
Duplicate of J1B887	J1B892	6/29/10	11200		15.2	0.762	U	0.762	76.2		0.762	88.1		0.38	0.338		0.152
B1	J1B880	6/29/10	9580		16.7	0.836	U	0.836	39.5		0.836	73.9		0.42	0.281		0.167
B2	J1B881	6/29/10	10300		16.0	0.801	U	0.801	43.8		0.801	75.7		0.40	0.307		0.160
B3	J1B882	6/29/10	11200		14.2	0.711	U	0.711	45.1		0.711	80.2		0.36	0.334		0.142
B4	J1B883	6/29/10	11000		18.1	0.904	U	0.904	39.1		0.904	80.4		0.45	0.324		0.181
B13[b]	J1B884	6/29/10	11300		20.2	1.01	U	1.01	24.8		1.01	86.1		0.51	0.336		0.202
B6	J1B885	6/29/10	10500		19.0	0.95	U	0.95	12.9		0.950	82.0		0.48	0.281		0.190
B7	J1B886	6/29/10	11400		15.0	0.752	U	0.752	14.2		0.752	78.3		0.38	0.351		0.150
B9	J1B888	6/29/10	10700		16.3	0.814	U	0.814	36.5		0.814	80.6		0.41	0.316		0.163
B10	J1B889	6/29/10	9420		17.5	0.877	U	0.877	47.6		0.877	76.3		0.44	0.281		0.175
B11	J1B890	6/29/10	11100		16.0	0.801	U	0.801	97.7		0.801	86.8		0.40	0.341		0.160
B12	J1B891	6/29/10	11000		17.0	0.848	U	0.848	16.0		0.848	113		0.42	0.380		0.170
C8	J1B8B0	6/29/10	8650		13.6	0.239	JB	0.680	6.90		0.680	83.9		0.34	0.254		0.136
Duplicate of J1B8B0	J1B8B5	6/29/10	8570		13.8	0.688	UJ	0.688	7.00		0.688	85.2		0.34	0.250		0.138
C1	J1B893	6/17/10	8190		14.2	0.711	U	0.711	3.92		0.711	126		0.36	0.270		0.142
C2	J1B894	6/17/10	8790		15.0	0.751	U	0.751	4.01		0.751	114		0.38	0.282		0.150
C3	J1B895	6/17/10	10000		12.9	0.644	U	0.644	3.41		0.644	89.2		0.32	0.299		0.129
C4	J1B896	6/17/10	10500		16.5	0.823	U	0.823	3.19		0.823	102		0.41	0.309		0.165
C5	J1B897	6/17/10	10700		17.9	0.894	U	0.894	3.65		0.894	97.9		0.45	0.318		0.179
C6	J1B8B1	6/17/10	10600		16.7	0.837	U	0.837	4.38		0.837	97.3		0.42	0.306		0.167
C7	J1B899	6/29/10	7380		15.5	0.774	UJ	0.774	2.50		0.774	50.9		0.39	0.213		0.155
C9	J1B898	6/29/10	9880		15.2	0.762	UJ	0.762	9.36		0.762	90		0.38	0.289		0.152
C10	J1B8B2	6/29/10	8190		13.1	0.657	UJ	0.657	18.6		0.657	102		0.33	0.292		0.131
C11	J1B8B3	6/29/10	8440		15.1	0.753	UJ	0.753	11.2		0.753	72.2		0.38	0.247		0.151
C12	J1B8B4	6/29/10	10100		15.3	0.765	UJ	0.765	15.6		0.765	77.5		0.38	0.296		0.153

[a] = resample collected due to dieldrin exceedance

[b] = Sample B-13 was mislabeled in the verification work instruction.

There are a total of 12 samples for this decision unit.

B = organics: method blank contamination, inorganics: estimated result

D = result reported from a dilution

J = organics: estimated result; inorganics: method blank contamination

K = unresolved due to matrix interference

M = sample duplicate precision not met

N = recovery outside control limits

ND = not detected (asbestos)

Attachment 1 Sheet No. 1 of 45

Originator J. D. Skoglie Date 9/13/11

Checked T. E. Queen Date 9/13/11

Calc. No. 0100H-CA-V0178 Rev. No. 1

PQL = practical quantitation limit

Q = qualifier

U = undetected

X = more than 40% difference between the primary and confirmation detector results, lower result reported

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	12700		15.9	0.793	UJ	0.793	3.31		0.793	98.6		0.40	0.385		0.159
Duplicate of J1B8C0	J1B8C8	6/29/10	12900		15.0	0.749	UJ	0.749	3.29		0.749	101		0.37	0.396		0.150
D1	J1B8B6	6/29/10	11000		14.9	0.743	UJ	0.743	3.46		0.743	98.7		0.37	0.338		0.149
D2	J1B8B7	6/29/10	6910		19.8	0.990	UJ	0.990	3.14		0.990	105		0.50	0.240		0.198
D3	J1B8B8	6/29/10	9840		13.5	0.677	UJ	0.677	3.31		0.677	91.4		0.34	0.301		0.135
D4	J1B8B9	6/29/10	9000		17.6	0.881	UJ	0.881	2.75		0.881	71.4		0.44	0.263		0.176
D6	J1B8C1	6/29/10	7620		16.0	0.798	UJ	0.798	2.96		0.798	76.5		0.40	0.211		0.160
D7	J1B8C2	6/29/10	9300		13.6	0.680	UJ	0.680	2.78		0.680	85.7		0.34	0.279		0.136
D8	J1B8C3	6/29/10	7330		13.6	0.680	UJ	0.680	2.26		0.680	58.1		0.34	0.205		0.136
D9	J1B8C4	6/29/10	10900		16.1	0.806	UJ	0.806	3.57		0.806	85.1		0.40	0.328		0.161
D10	J1B8C5	6/29/10	8130		16.4	0.822	UJ	0.822	6.68		0.822	107		0.41	0.272		0.164
D11	J1B8C6	6/29/10	9590		12.7	0.635	UJ	0.635	10.7		0.635	97.2		0.32	0.290		0.127
D12	J1B8C7	6/29/10	8670		15.1	0.757	UJ	0.757	3.8		0.757	61.4		0.38	0.245		0.151
E-6	J1JCT4	5/31/11	9290		1.3	0.33	U	0.33	5.9		0.57	88.2		0.065	0.16	B	0.028
Duplicate of J1JCT4	J1JCV1	5/31/11	9810		1.5	0.37	U	0.37	6.0		0.64	87.8		0.074	0.17	B	0.032
E-1	J1JCR9	5/31/11	6830		1.7	0.41	U	0.41	3.7	M	0.72	60.7		0.083	0.036	U	0.036
E-2	J1JCT0	5/31/11	5660		1.4	0.33	U	0.33	2.2		0.58	51.4		0.067	0.029	U	0.029
E-3	J1JCT1	5/31/11	8430		1.5	0.38	U	0.38	2.5		0.66	71.2		0.076	0.066	B	0.033
E-4	J1JCT2	5/31/11	5420		1.4	0.35	U	0.35	1.7		0.61	49.7		0.070	0.031	U	0.031
E-5	J1JCT3	5/31/11	5380		1.3	0.33	U	0.33	4.1		0.57	52.6		0.066	0.029	U	0.029
E-7	J1JCT5	5/31/11	5550		1.5	0.37	U	0.37	3.1		0.64	52.6		0.073	0.032	U	0.032
E-8	J1JCT6	5/31/11	8550		1.4	0.35	U	0.35	2.9		0.61	70.7		0.071	0.13	B	0.031
E-9	J1JCT7	5/31/11	6130		1.5	0.36	U	0.36	2.7		0.63	49.8		0.073	0.032	U	0.032
E-10	J1JCT8	5/31/11	7920		1.5	0.37	U	0.37	4.5		0.64	74.0		0.074	0.11	B	0.032
E-11	J1JCT9	5/31/11	6660		1.5	0.36	U	0.36	2.5		0.63	41.6		0.073	0.068	B	0.032
E-12	J1JCV0	5/31/11	5790		1.6	0.38	U	0.38	1.7		0.67	43.6		0.077	0.033	U	0.033
F-2	J1JCV3	5/26/11	10200		1.5	0.38	U	0.38	3.9		0.65	93.4		0.075	0.27		0.033
Duplicate of J1JCV3	J1JCW4	5/26/11	10100		1.5	0.38	U	0.38	3.9		0.66	89.4		0.076	0.27		0.033
F-1	J1JCV2	5/26/11	9670		1.5	0.37	U	0.37	3.8		0.65	84.3		0.075	0.25		0.032
F-3	J1JCV4	5/26/11	9890		1.5	0.36	U	0.36	3.4		0.63	84.9		0.073	0.27		0.032
F-4	J1JCV5	5/26/11	10200		1.5	0.36	U	0.36	3.4		0.63	93.9		0.073	0.26		0.032
F-5	J1JCV6	5/26/11	10500		1.4	0.34	U	0.34	4.0		0.60	89.1		0.069	0.28		0.030
F-6	J1JCV7	5/26/11	11100		1.6	0.39	U	0.39	4.1		0.68	97.6		0.078	0.29		0.034
F-7	J1JCV8	5/26/11	10800		1.4	0.35	U	0.35	3.3		0.61	96.7		0.070	0.28		0.031
F-8	J1JCV9	5/26/11	9070		1.5	0.37	U	0.37	3.4		0.65	74.3		0.075	0.23		0.032
F-9	J1JCW0	5/26/11	9170		1.4	0.35	U	0.35	3.4		0.61	72.6		0.070	0.24		0.030
F-10	J1JCW1	5/26/11	9540		1.6	0.39	U	0.39	3.4		0.67	67.3		0.077	0.22		0.034
F-11	J1JCW2	5/26/11	7500		1.4	0.35	U	0.35	3.2		0.61	64.7		0.071	0.17	B	0.031
F-12	J1JCW3	5/26/11	10700		1.4	0.34	U	0.34	3.6		0.59	88.9		0.068	0.29		0.030
Equipment blank	J1B853	6/30/10	147		16.7	0.834	U	0.834	0.834	U	0.834	1.42		0.42	0.167	U	0.17
Equipment blank	J1JCW5	5/26/11	192		1.5	0.36	U	0.36	0.62	U	0.62	2.2		0.072	0.031	U	0.031

Attachment	1	Sheet No.	2 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	2.71		1.67	0.088	B	0.21	3410		16.7	12.2		0.84	5.83		2.51
Duplicate of J1B856	J1B866	6/30/10	2.85		1.57	0.086	B	0.20	3390		15.7	12.0		0.78	6.11		2.35
A1	J1B854	6/30/10	1.96		1.75	0.187	B	0.22	15500		17.5	10.8		0.87	6.37		2.62
A2	J1B855	6/30/10	2.37		1.69	0.122	B	0.21	3540		16.9	14.6		0.84	6.69		2.53
A4	J1B857	6/30/10	3.20		1.64	0.148	B	0.21	3830		16.4	13.0		0.82	6.16		2.46
A5	J1B858	6/30/10	2.53		1.74	0.113	B	0.22	3310		17.4	12.7		0.87	6.14		2.61
A6	J1B859	6/30/10	2.79		1.71	0.179	B	0.21	3550		17.1	13.1		0.86	5.95		2.56
A7	J1B860	6/30/10	3.17		1.69	0.177	B	0.21	3670		16.9	11.6		0.85	5.47		2.54
A8	J1B861	6/30/10	2.58		1.68	0.091	B	0.21	3440		16.8	12.7		0.84	5.92		2.52
A9	J1B862	6/30/10	3.10		1.34	0.181		0.17	3480		13.4	12.0		0.67	5.72		2.01
A-9[a]	J1JVX2	6/16/11	2.80		0.91	0.290		0.038	3680		13.0	12.4		0.054	6.6		0.092
A10	J1B863	6/30/10	2.66		1.90	0.116	B	0.24	3480		19.0	13.7		0.95	6.75		2.85
A11	J1B864	6/30/10	2.11		1.36	0.121	B	0.17	4360		13.6	10.2		0.68	6.84		2.04
A12	J1B865	6/30/10	1.93		1.64	0.114	B	0.21	5080		16.4	12.6		0.82	6.8		2.47
B8	J1B887	6/29/10	3.04		1.49	0.130	B	0.19	4090		14.9	14.0		0.74	6.75		2.23
Duplicate of J1B892	J1B892	6/29/10	3.21		1.52	0.124	B	0.19	4220		15.2	14.3		0.76	6.58		2.29
B1	J1B880	6/29/10	2.11		1.67	0.196	B	0.21	3560		16.7	14.4		0.84	6.04		2.51
B2	J1B881	6/29/10	2.17		1.60	0.112	B	0.20	3670		16.0	13.5		0.80	6.22		2.40
B3	J1B882	6/29/10	2.06		1.42	0.085	B	0.18	3940		14.2	14.7		0.71	6.70		2.13
B4	J1B883	6/29/10	2.01		1.81	0.123	B	0.23	3660		18.1	14.5		0.90	6.68		2.71
B13[b]	J1B884	6/29/10	2.93		2.02	0.143	B	0.25	4100		20.2	14.4		1.01	6.87		3.04
B6	J1B885	6/29/10	3.51		1.90	0.158	B	0.24	4300		19.0	13.0		0.95	6.02		2.85
B7	J1B886	6/29/10	2.19		1.50	0.105	B	0.19	4070		15.0	14.9		0.75	7.03		2.26
B9	J1B888	6/29/10	2.52		1.63	0.146	B	0.20	3760		16.3	13.2		0.81	6.61		2.44
B10	J1B889	6/29/10	2.85		1.75	0.124	B	0.22	3600		17.5	12.7		0.88	5.94		2.63
B11	J1B890	6/29/10	2.37		1.60	0.104	B	0.20	3820		16.0	13.9		0.80	6.81		2.40
B12	J1B891	6/29/10	5.53		1.70	0.161	B	0.21	4800		17.0	18.8		0.85	7.33		2.54
C8	J1B8B0	6/29/10	3.15		1.36	0.118	B	0.17	4140		13.6	12.8	J	0.68	6.06		2.03
Duplicate of J1B8B0	J1B8B5	6/29/10	2.55		1.38	0.129	B	0.17	4080		13.8	12.1	J	0.69	6.06		2.06
C1	J1B893	6/17/10	8.00		1.42	0.187		0.18	4090		14.2	11.6		0.71	6.06		2.13
C2	J1B894	6/17/10	7.13		1.50	0.159	B	0.19	4050		15.0	12.4		0.75	6.13		2.25
C3	J1B895	6/17/10	2.31		1.29	0.101	B	0.16	3190		12.9	12.6		0.64	6.89		1.93
C4	J1B896	6/17/10	2.83		1.65	0.130	B	0.21	3760		16.5	13.6		0.82	7.65		2.47
C5	J1B897	6/17/10	2.72		1.79	0.131	B	0.22	3270		17.9	12.3		0.89	7.10		2.68
C6	J1B8B1	6/17/10	3.76		1.67	0.148	B	0.21	3550		16.7	12.4		0.84	7.21		2.51
C7	J1B899	6/29/10	1.69		1.55	0.123	B	0.19	5500		15.5	12.9	J	0.77	5.87		2.32
C9	J1B898	6/29/10	3.47		1.52	0.130	B	0.19	4450		15.2	14.3	J	0.76	6.38		2.29
C10	J1B8B2	6/29/10	5.28		1.31	0.191		0.16	3910		13.1	15.8	J	0.66	5.17		1.97
C11	J1B8B3	6/29/10	2.02		1.51	0.111	B	0.19	3370		15.1	12.6	J	0.75	5.09		2.26
C12	J1B8B4	6/29/10	2.31		1.53	0.105	B	0.19	3820		15.3	13.4	J	0.77	6.17		2.29

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	2.26		1.59	0.137	B	0.20	3970		15.9	15.0	J	0.793	7.44		2.38
Duplicate of J1B8C0	J1B8C8	6/29/10	2.2		1.50	0.13	B	0.19	4010		15.0	15.2	J	0.749	7.67		2.25
D1	J1B8B6	6/29/10	3.53		1.49	0.129	B	0.19	3830		14.9	14.5	J	0.743	6.81		2.23
D2	J1B8B7	6/29/10	7.11		1.98	0.191	B	0.25	5140		19.8	11.3	J	0.990	5.14		2.97
D3	J1B8B8	6/29/10	3.26		1.35	0.108	B	0.17	3740		13.5	13.3	J	0.677	6.26		2.03
D4	J1B8B9	6/29/10	2.21		1.76	0.153	B	0.22	4960		17.6	14.6	J	0.881	7.05		2.64
D6	J1B8C1	6/29/10	3.42		1.60	0.144	B	0.20	5160		16.0	12.9	J	0.798	5.82		2.40
D7	J1B8C2	6/29/10	1.99		1.36	0.129	B	0.17	4430		13.6	12.2	J	0.680	7.10		2.04
D8	J1B8C3	6/29/10	1.61		1.36	0.123	B	0.17	5060		13.6	12.1	J	0.680	6.34		2.04
D9	J1B8C4	6/29/10	1.91		1.61	0.146	B	0.20	3650		16.1	13.4	J	0.806	6.59		2.42
D10	J1B8C5	6/29/10	6.91		1.64	0.227		0.21	4450		16.4	12.5	J	0.822	6.10		2.47
D11	J1B8C6	6/29/10	4.12		1.27	0.14	B	0.16	5110		12.7	16.4	J	0.635	6.13		1.90
D12	J1B8C7	6/29/10	1.91		1.51	0.119	B	0.19	4130		15.1	14.7	J	0.757	6.26		2.27
E-6	J1JCT4	5/31/11	2.8		0.84	0.11	B	0.035	3300		12.1	12.4		0.050	6.8		0.086
Duplicate of J1JCT4	J1JCV1	5/31/11	2.7		0.95	0.11	B	0.040	3340		13.7	13.5		0.056	6.9		0.097
E-1	J1JCR9	5/31/11	1.1	B	1.1	0.063	B	0.045	3980		15.4	11.0		0.063	6.9		0.11
E-2	J1JCT0	5/31/11	0.98	B	0.86	0.064	B	0.036	3860		12.4	16.5		0.051	5.9		0.088
E-3	J1JCT1	5/31/11	1.3	B	0.98	0.086	B	0.041	5060		14.1	10.7		0.058	7.6		0.10
E-4	J1JCT2	5/31/11	0.91	U	0.91	0.041	B	0.038	3440		13.1	9.7		0.054	5.8		0.093
E-5	J1JCT3	5/31/11	0.85	U	0.85	0.041	B	0.036	3720		12.3	9.4		0.050	5.1		0.087
E-7	J1JCT5	5/31/11	0.94	U	0.94	0.048	B	0.040	2950		13.6	10.8		0.056	5.2		0.096
E-8	J1JCT6	5/31/11	1.3	B	0.91	0.076	B	0.038	5340		13.1	13.3		0.054	6.3		0.093
E-9	J1JCT7	5/31/11	0.94	U	0.94	0.039	U	0.039	3610		13.5	11.0		0.056	5.7		0.096
E-10	J1JCT8	5/31/11	1.6	B	0.95	0.083	B	0.04	3470		13.6	11.8		0.056	5.8		0.097
E-11	J1JCT9	5/31/11	0.94	U	0.94	0.042	B	0.039	5970		13.5	12.8		0.056	5.6		0.096
E-12	J1JCV0	5/31/11	0.99	U	0.99	0.045	B	0.041	3480		14.2	9.6		0.058	6.6		0.10
F-2	J1JCV3	5/26/11	2.1		0.97	0.091	B	0.041	3930		14.0	12.2		0.057	7.0	X	0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	2.0		0.98	0.087	B	0.041	3850		14.1	12.7		0.058	6.9	X	0.10
F-1	J1JCV2	5/26/11	1.5	B	0.96	0.083	B	0.040	4060		13.8	12.6		0.057	7.1	X	0.098
F-3	J1JCV4	5/26/11	1.4	B	0.94	0.082	B	0.039	4430		13.5	15.2		0.056	7.1	X	0.096
F-4	J1JCV5	5/26/11	1.9		0.94	0.11	B	0.039	3470		13.5	12.5		0.056	7.0	X	0.096
F-5	J1JCV6	5/26/11	1.4	B	0.89	0.070	B	0.037	3840		12.8	12.4		0.053	7.4	X	0.091
F-6	J1JCV7	5/26/11	1.6	B	1.0	0.094	B	0.042	3820		14.5	15.0		0.060	7.4	X	0.10
F-7	J1JCV8	5/26/11	1.6	B	0.91	0.097	B	0.038	3730		13.0	12.5		0.054	7.6	X	0.092
F-8	J1JCV9	5/26/11	1.4	B	0.96	0.080	B	0.040	4720		13.8	11.7		0.057	6.8	X	0.098
F-9	J1JCW0	5/26/11	1.5	B	0.90	0.076	B	0.038	5030		12.9	11.8		0.053	7.0	X	0.092
F-10	J1JCW1	5/26/11	1.8	B	1.0	0.086	B	0.042	7490		14.3	18.0		0.059	7.2	X	0.10
F-11	J1JCW2	5/26/11	1.3	B	0.91	0.069	B	0.038	9080		13.1	9.3		0.054	6.4	X	0.093
F-12	J1JCW3	5/26/11	1.9		0.88	0.085	B	0.037	4140		12.6	12.9		0.052	7.7	X	0.089
Equipment blank	J1B853	6/30/10	1.67	U	1.67	0.209	U	0.21	32.7		16.7	0.524	B	0.83	0.11	BX	0.094
Equipment blank	J1JCW5	5/26/11	0.92	U	0.92	0.039	U	0.039	43.5	B	13.3	0.13	B	0.055			

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium			Manganese		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	13.1		1.67	0.20	U	0.20	16500		16.7	139		0.835	3510		4.18	302		0.835
Duplicate of J1B856	J1B866	6/30/10	13.6		1.57	0.20	U	0.20	16500		15.7	137		0.784	3440		3.92	301		0.784
A1	J1B854	6/30/10	13.1		1.75	0.20	U	0.20	18900		17.5	73.6		0.874	4000		4.37	301		0.874
A2	J1B855	6/30/10	13.8		1.69	0.20	U	0.20	19500		16.9	84.2		0.844	4250		4.22	329		0.844
A4	J1B857	6/30/10	12.6		1.64	0.21	U	0.21	18200		16.4	406		0.820	3720		4.10	331		0.820
A5	J1B858	6/30/10	12.3		1.74	0.20	U	0.20	17800		17.4	164		0.870	3710		4.35	304		0.870
A6	J1B859	6/30/10	12.7		1.71	0.21	U	0.21	17800		17.1	278		0.855	3620		4.27	300		0.855
A7	J1B860	6/30/10	12.8		1.69	0.20	U	0.20	16300		16.9	319		0.845	3640		4.23	289		0.845
A8	J1B861	6/30/10	12.0		1.68	0.20	U	0.20	17100		16.8	98		0.839	3480		4.20	291		0.839
A9	J1B862	6/30/10	13.1		1.34	0.21	U	0.21	16800		13.4	199		0.669	3430		3.35	285		0.669
A-9[a]	J1JVX2	6/16/11	14.0		0.20	0.155	U	0.16	16900		3.50	348	X	0.15	3810		3.40	311		0.15
A10	J1B863	6/30/10	13.7		1.9	0.20	U	0.20	19200		19.0	224		0.949	3980		4.74	326		0.949
A11	J1B864	6/30/10	13.8		1.36	0.20	U	0.20	18600		13.6	88.3		0.678	3510		3.39	282		0.678
A12	J1B865	6/30/10	13.0		1.64	0.20	U	0.20	18800		16.4	86.0		0.822	3940		4.11	302		0.822
B8	J1B887	6/29/10	11.3		1.49	0.21	U	0.21	19900		14.9	124		0.744	4220		3.72	342		0.744
Duplicate of J1B892	J1B892	6/29/10	12.0		1.52	0.21	U	0.21	20100		15.2	209		0.762	4220		3.81	351		0.762
B1	J1B880	6/29/10	10.2		1.67	0.20	U	0.20	19000		16.7	98.3		0.836	3690		4.18	303		0.836
B2	J1B881	6/29/10	10.7		1.60	0.21	U	0.21	18900		16.0	43.6		0.801	4010		4.00	315		0.801
B3	J1B882	6/29/10	13.1		1.42	0.20	U	0.20	20400		14.2	24.0		0.711	4300		3.56	324		0.711
B4	J1B883	6/29/10	12.2		1.81	0.21	U	0.21	19900		18.1	48.3		0.904	4220		4.52	335		0.904
B13[b]	J1B884	6/29/10	12.4		2.02	0.21	U	0.21	20800		20.2	58.3		1.01	4330		5.06	347		1.01
B6	J1B885	6/29/10	13.0		1.90	0.20	U	0.20	18800		19.0	166		0.95	3930		4.75	296		0.95
B7	J1B886	6/29/10	13.5		1.50	0.20	U	0.20	20900		15.0	9.41		0.752	4650		3.76	337		0.752
B9	J1B888	6/29/10	11.3		1.63	0.21	U	0.21	19400		16.3	178		0.814	4090		4.07	341		0.814
B10	J1B889	6/29/10	10.3		1.75	0.20	U	0.20	18300		17.5	125		0.877	3700		4.39	299		0.877
B11	J1B890	6/29/10	11.8		1.60	0.21	U	0.21	20200		16.0	95.7		0.801	4070		4.01	354		0.801
B12	J1B891	6/29/10	16.8		1.70	0.21	U	0.21	22100		17.0	30.1		0.848	4630		4.24	345		0.848
C8	J1B8B0	6/29/10	14.0		1.36	0.14	B	0.20	17800		13.6	16.3		0.678	4370	J	3.39	276		0.678
Duplicate of J1B8B0	J1B8B5	6/29/10	11.9		1.38	0.18	B	0.20	17900		13.8	17.5		0.688	4350	J	3.44	280		0.688
C1	J1B893	6/17/10	14.4		1.42	0.18	B	0.21	17400		14.2	21.2		0.711	3910		3.56	270		0.711
C2	J1B894	6/17/10	12.8		1.50	0.16	B	0.20	16200		15.0	18.8		0.751	3930		3.75	270		0.751
C3	J1B895	6/17/10	13.1		1.29	0.11	B	0.20	17600		12.9	4.99		0.644	4380		3.22	290		0.644
C4	J1B896	6/17/10	15.0		1.65	0.14	B	0.20	19600		16.5	4.78		0.823	5100		4.11	320		0.823
C5	J1B897	6/17/10	13.3		1.79	0.19	B	0.21	18500		17.9	5.69		0.894	4220		4.47	314		0.894
C6	J1B8B1	6/17/10	13.3		1.67	0.11	B	0.22	19600		16.7	13.1		0.837	4330		4.19	326		0.837
C7	J1B899	6/29/10	15.5		1.55	0.18	B	0.20	16500		15.5	5.07		0.774	5180	J	3.87	235		0.774
C9	J1B898	6/29/10	13.8		1.52	0.16	B	0.20	19900		15.2	37.9		0.762	4560	J	3.81	305		0.762
C10	J1B8B2	6/29/10	11.9		1.31	0.11	B	0.20	14900		13.1	198		0.657	3730	J	3.29	250		0.657
C11	J1B8B3	6/29/10	8.93		1.51	0.20	U	0.20	15300		15.1	32.0		0.753	3840	J	3.76	249		0.753
C12	J1B8B4	6/29/10	12.2		1.53	0.20	U	0.20	17700		15.3	43.6		0.765	4220	J	3.82	287		0.765

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample	HEIS	Sample	Copper			Hexavalent chromium			Iron			Lead			Magnesium			Manganese		
location	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	13.3		1.59	0.20	U	0.20	22500		15.9	5.03		0.793	5040	J	3.96	369		0.793
Duplicate of J1B8C0	J1B8C8	6/29/10	13.4		1.50	0.11	B	0.22	22700		15.0	5.09		0.749	5070	J	3.74	374		0.749
D1	J1B8B6	6/29/10	12.1		1.49	0.16	B	0.20	18600		14.9	3.75		0.743	5070	J	3.71	326		0.743
D2	J1B8B7	6/29/10	12.6		1.98	0.21	U	0.21	14100		19.8	19.9		0.990	3900	J	4.95	222		0.990
D3	J1B8B8	6/29/10	12.0		1.35	0.20	U	0.20	17100		13.5	4.08		0.677	4890	J	3.38	284		0.677
D4	J1B8B9	6/29/10	13.6		1.76	0.21	U	0.21	22100		17.6	6.90		0.881	4430	J	4.40	310		0.881
D6	J1B8C1	6/29/10	13.7		1.60	0.070	B	0.20	17100		16.0	19.6		0.798	3890	J	3.99	267		0.798
D7	J1B8C2	6/29/10	12.3		1.36	0.14	B	0.20	21200		13.6	4.90		0.680	4070	J	3.40	333		0.680
D8	J1B8C3	6/29/10	11.7		1.36	0.16	B	0.20	20400		13.6	4.67		0.680	4150	J	3.40	282		0.680
D9	J1B8C4	6/29/10	10.9		1.61	0.18	B	0.21	19800		16.1	5.13		0.806	4300	J	4.03	343		0.806
D10	J1B8C5	6/29/10	17.4		1.64	0.09	B	0.20	17600		16.4	74.9		0.822	3800	J	4.11	275		0.822
D11	J1B8C6	6/29/10	13.8		1.27	0.12	B	0.20	17800		12.7	44.4		0.635	3830	J	3.17	277		0.635
D12	J1B8C7	6/29/10	12.5		1.51	0.17	B	0.20	19500		15.1	14.4		0.757	4300	J	3.79	284		0.757
E-6	J1JCT4	5/31/11	13.2	X	0.19	0.154	U	0.15	16700		3.3	5.7		0.23	4260		3.2	324		0.086
Duplicate of J1JCT4	J1JCV1	5/31/11	13.2	X	0.21	0.154	U	0.15	17300		3.7	5.4		0.26	4380		3.6	310		0.097
E-1	J1JCR9	5/31/11	15.9	X	0.24	0.155	U	0.155	16700		4.1	3		0.29	4590		4.0	284		0.11
E-2	J1JCT0	5/31/11	15.0	X	0.19	0.917		0.154	13800		3.3	4.9		0.24	4700		3.3	230		0.088
E-3	J1JCT1	5/31/11	17.4	X	0.22	0.154	U	0.154	17100		3.8	4.2		0.27	4540		3.7	331		0.10
E-4	J1JCT2	5/31/11	13.6	X	0.20	0.155	U	0.155	13700		3.5	2.6		0.25	4030		3.4	225		0.093
E-5	J1JCT3	5/31/11	21.9	X	0.19	0.154	U	0.154	12800		3.3	6.5		0.24	3850		3.2	203		0.087
E-7	J1JCT5	5/31/11	14.2	X	0.21	0.154	U	0.154	13100		3.7	8.1		0.26	3760		3.6	197		0.096
E-8	J1JCT6	5/31/11	13.1	X	0.20	0.154	U	0.154	15600		3.5	4.9		0.25	4810		3.4	266		0.093
E-9	J1JCT7	5/31/11	14.5	X	0.21	0.153	U	0.153	14800		3.6	4.5		0.26	4020		3.6	201		0.096
E-10	J1JCT8	5/31/11	10.7	X	0.21	0.155	U	0.155	14700		3.7	11.6		0.26	3820		3.6	251		0.097
E-11	J1JCT9	5/31/11	16.1	X	0.21	0.154	U	0.154	14100		3.6	3.2		0.26	4210		3.6	212		0.096
E-12	J1JCV0	5/31/11	15.9	X	0.22	0.154	U	0.154	15200		3.8	2.8		0.27	4230		3.7	236		0.10
F-2	J1JCV3	5/26/11	12.5		0.21	0.265		0.154	19800		3.8	5.4		0.27	4600		3.7	330		0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	13.0		0.22	0.154	U	0.154	19600		3.8	5.2		0.27	4710		3.7	329		0.10
F-1	J1JCV2	5/26/11	14.0		0.21	0.154	U	0.154	19400		3.7	6.7		0.27	4900		3.6	315		0.098
F-3	J1JCV4	5/26/11	14.1		0.21	0.154	U	0.154	19500		3.6	5.5		0.26	5100		3.6	309		0.096
F-4	J1JCV5	5/26/11	11.6		0.21	0.223		0.155	19900		3.6	5.4		0.26	4350		3.5	342		0.096
F-5	J1JCV6	5/26/11	13.8		0.20	0.155	U	0.155	20400		3.4	5.6		0.25	4930		3.4	326		0.091
F-6	J1JCV7	5/26/11	13.2		0.22	0.221		0.155	21000		3.9	5.7		0.28	4920		3.8	359		0.10
F-7	J1JCV8	5/26/11	13.4		0.20	0.154	U	0.154	21200		3.5	5.8		0.25	4680		3.4	351		0.092
F-8	J1JCV9	5/26/11	15.0		0.21	0.154	U	0.154	19400		3.7	5.3		0.26	4850		3.6	305		0.098
F-9	J1JCW0	5/26/11	14.1		0.20	0.154	U	0.154	19100		3.5	5.5		0.25	4890		3.4	297		0.092
F-10	J1JCW1	5/26/11	17.3		0.22	0.154	U	0.154	19900		3.9	5.3		0.27	5550		3.8	291		0.10
F-11	J1JCW2	5/26/11	15.1		0.20	0.155	U	0.155	17200		3.5	3.9		0.25	4500		3.4	250		0.093
F-12	J1JCW3	5/26/11	14.9		0.19	0.154	U	0.154	21100		3.4	6.1		0.24	5270		3.3	342		0.089
Equipment blank	J1B853	6/30/10	1.67	U	1.67	0.20	U	0.20	192		16.7	0.269	B	0.83	23.2		4.17	3.36		0.83
Equipment blank	J1JCW5	5/26/11	0.11	BX	0.09	0.20	U	0.20	359		3.6	0.25	U	0.25	26.7		3.5	5.5		0.094

Attachment	1	Sheet No.	6 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	0.027	U	0.027	0.338	B	0.835	10.4		2.09	1720		83.5	0.251	U	0.251
Duplicate of J1B856	J1B866	6/30/10	0.028	U	0.028	0.283	B	0.784	10.7		1.96	1790		78.4	0.235	U	0.235
A1	J1B854	6/30/10	0.0090	B	0.020	0.346	B	0.874	9.5		2.18	1500		87.4	0.262	U	0.262
A2	J1B855	6/30/10	0.029	U	0.029	0.422	B	0.844	12.6		2.11	2150		84.4	0.253	U	0.253
A4	J1B857	6/30/10	0.025	U	0.025	0.459	B	0.820	10.4		2.05	1980		82.0	0.246	U	0.246
A5	J1B858	6/30/10	0.026	U	0.026	0.354	B	0.870	10		2.18	2050		87.0	0.261	U	0.261
A6	J1B859	6/30/10	0.025	U	0.025	0.337	B	0.855	10.6		2.14	1850		85.5	0.256	U	0.256
A7	J1B860	6/30/10	0.023	U	0.023	0.421	B	0.845	11		2.11	1630		84.5	0.254	U	0.254
A8	J1B861	6/30/10	0.025	U	0.025	0.368	B	0.839	10.5		2.1	1620		83.9	0.252	U	0.252
A9	J1B862	6/30/10	0.025	U	0.025	0.381	B	0.669	10.4		1.67	1920		66.9	0.201	U	0.201
A-9[a]	J1JVX2	6/16/11	0.020	M	0.0053	0.28	B	0.15	10.7		0.11	1880		37.9	0.80	U	0.80
A10	J1B863	6/30/10	0.025	U	0.025	0.315	B	0.949	11.7		2.37	2540		94.9	0.285	U	0.285
A11	J1B864	6/30/10	0.020	B	0.030	0.369	B	0.678	9.32		1.7	1290		67.8	0.204	U	0.204
A12	J1B865	6/30/10	0.027	U	0.027	0.369	B	0.822	8.99		2.05	1810		82.2	0.247	U	0.247
B8	J1B887	6/29/10	0.028	U	0.028	0.217	B	0.744	11.1		1.86	2290		74.4	0.223	U	0.223
Duplicate of J1B892	J1B892	6/29/10	0.026	U	0.026	0.233	B	0.762	11.1		1.91	2370		76.2	0.229	U	0.229
B1	J1B880	6/29/10	0.025	U	0.025	0.232	B	0.836	10.5		2.09	1750		83.6	0.251	U	0.251
B2	J1B881	6/29/10	0.025	U	0.025	0.269	B	0.801	11.1		2	1820		80.1	0.24	U	0.24
B3	J1B882	6/29/10	0.025	U	0.025	0.216	B	0.711	12.1		1.78	2040		71.1	0.213	U	0.213
B4	J1B883	6/29/10	0.025	U	0.025	0.224	B	0.904	11.7		2.26	2020		90.4	0.271	U	0.271
B13[b]	J1B884	6/29/10	0.027	U	0.027	0.33	B	1.01	11.8		2.53	2210		101	0.304	U	0.304
B6	J1B885	6/29/10	0.028	U	0.028	0.23	B	0.95	10.6		2.37	1690		95	0.285	U	0.285
B7	J1B886	6/29/10	0.009	B	0.020	0.233	B	0.752	12.9		1.88	1670		75.2	0.226	U	0.226
B9	J1B888	6/29/10	0.023	U	0.023	0.228	B	0.814	11.1		2.04	2290		81.4	0.244	U	0.244
B10	J1B889	6/29/10	0.023	U	0.023	0.207	B	0.877	10.4		2.19	1780		87.7	0.263	U	0.263
B11	J1B890	6/29/10	0.026	U	0.026	0.22	B	0.801	11		2	2040		80.1	0.24	U	0.24
B12	J1B891	6/29/10	0.082		0.030	0.369	B	0.848	14		2.12	2170		84.8	0.254	U	0.254
C8	J1B8B0	6/29/10	0.027	U	0.027	0.301	B	0.678	9.96	J	1.7	1610		67.8	0.203	U	0.203
Duplicate of J1B8B0	J1B8B5	6/29/10	0.024	U	0.024	0.286	B	0.688	10.0	J	1.72	1620		68.8	0.206	U	0.206
C1	J1B893	6/17/10	0.030	B	0.030	0.434	B	0.711	10		1.78	1770		71.1	0.213	U	0.213
C2	J1B894	6/17/10	0.026	U	0.026	0.367	B	0.751	10.8		1.88	1840		75.1	0.225	U	0.225
C3	J1B895	6/17/10	0.031	U	0.031	0.298	B	0.644	12.4		1.61	1940		64.4	0.193	U	0.193
C4	J1B896	6/17/10	0.026	U	0.026	0.325	B	0.823	14.3		2.06	1770		82.3	0.247	U	0.247
C5	J1B897	6/17/10	0.026	U	0.026	0.301	B	0.894	12.6		2.24	2210		89.4	0.268	U	0.268
C6	J1B8B1	6/17/10	0.032	U	0.032	0.345	B	0.837	11.5		2.09	2010		83.7	0.251	U	0.251
C7	J1B899	6/29/10	0.030	U	0.030	0.354	B	0.774	17.6	J	1.93	837		77.4	0.232	U	0.232
C9	J1B898	6/29/10	0.028	U	0.028	0.331	B	0.762	11.2	J	1.91	1740		76.2	0.229	U	0.229
C10	J1B8B2	6/29/10	0.015	B	0.020	0.299	B	0.657	9.53	J	1.64	1370		65.7	0.197	U	0.197
C11	J1B8B3	6/29/10	0.023	U	0.023	0.249	B	0.753	9.64	J	1.88	1570		75.3	0.226	U	0.226
C12	J1B8B4	6/29/10	0.0080	B	0.020	0.237	B	0.765	11.0	J	1.91	1760		76.5	0.229	U	0.229

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	0.029	U	0.029	0.352	B	0.793	13.0	J	1.98	2220		79.3	0.238	U	0.238
Duplicate of J1B8C0	J1B8C8	6/29/10	0.032	U	0.032	0.302	B	0.749	13.3	J	1.87	2280		74.9	0.225	U	0.225
D1	J1B8B6	6/29/10	0.027	U	0.027	0.288	B	0.743	11.8	J	1.86	2300		74.3	0.223	U	0.223
D2	J1B8B7	6/29/10	1.07		0.030	0.315	B	0.990	9.91	J	2.48	1170		99.0	0.297	U	0.297
D3	J1B8B8	6/29/10	0.026	U	0.026	0.242	B	0.677	11.2	J	1.69	1620		67.7	0.203	U	0.203
D4	J1B8B9	6/29/10	0.020	B	0.030	0.524	B	0.881	11.5	J	2.20	1420		88.1	0.264	U	0.264
D6	J1B8C1	6/29/10	0.035		0.030	0.389	B	0.798	11.1	J	2.00	1120		79.8	0.24	U	0.24
D7	J1B8C2	6/29/10	0.024	U	0.024	0.327	B	0.680	10.0	J	1.70	1650		68.0	0.204	U	0.204
D8	J1B8C3	6/29/10	0.010	B	0.030	0.427	B	0.680	10.5	J	1.70	1090		68.0	0.204	U	0.204
D9	J1B8C4	6/29/10	0.030	U	0.030	0.329	B	0.806	11.2	J	2.01	2060		80.6	0.242	U	0.242
D10	J1B8C5	6/29/10	0.048		0.030	0.481	B	0.822	10.4	J	2.05	1800		82.2	0.247	U	0.247
D11	J1B8C6	6/29/10	0.008	B	0.020	0.459	B	0.635	12.3	J	1.59	1570		63.5	0.19	U	0.19
D12	J1B8C7	6/29/10	0.029	U	0.029	0.302	B	0.757	10.5	J	1.89	1330		75.7	0.227	U	0.227
E-6	J1JCT4	5/31/11	0.0076	B	0.0053	0.22	U	0.22	11.4		0.11	2720		35.3	0.74	U	0.74
Duplicate of J1JCT4	J1JCV1	5/31/11	0.074		0.0057	0.25	U	0.25	11.7		0.12	2790		39.8	0.83	U	0.83
E-1	J1JCR9	5/31/11	0.0057	U	0.0057	0.49	B	0.28	10.6	M	0.13	828		44.7	0.94	U	0.94
E-2	J1JCT0	5/31/11	0.0054	B	0.0051	0.23	U	0.23	13.6		0.11	789		36.0	0.76	U	0.76
E-3	J1JCT1	5/31/11	0.0063	B	0.0055	0.26	U	0.26	11.9		0.12	1240		41.0	0.86	U	0.86
E-4	J1JCT2	5/31/11	0.0072	B	0.0056	0.24	U	0.24	9.1		0.11	635		38.0	0.80	U	0.80
E-5	J1JCT3	5/31/11	0.0055	U	0.0055	0.23	U	0.23	9.9		0.11	716		35.7	0.75	U	0.75
E-7	J1JCT5	5/31/11	0.011	B	0.0049	0.25	U	0.25	9.4		0.12	745		39.5	0.83	U	0.83
E-8	J1JCT6	5/31/11	0.0049	U	0.0049	0.24	U	0.24	12.3		0.11	1610		38.1	0.80	U	0.80
E-9	J1JCT7	5/31/11	0.0054	U	0.0054	0.25	U	0.25	10.2		0.12	805		39.4	0.83	U	0.83
E-10	J1JCT8	5/31/11	0.0054	U	0.0054	0.25	U	0.25	10.6		0.12	1630		39.7	0.83	U	0.83
E-11	J1JCT9	5/31/11	0.0062	B	0.0055	0.25	U	0.25	11		0.12	938		39.4	0.83	U	0.83
E-12	J1JCV0	5/31/11	0.0056	U	0.0056	0.26	U	0.26	9.8		0.12	710		41.3	0.87	U	0.87
F-2	J1JCV3	5/26/11	0.0053	U	0.0053	0.26	U	0.26	11.9		0.12	2040		40.6	0.85	U	0.85
Duplicate of J1JCV3	J1JCW4	5/26/11	0.0052	U	0.0052	0.26	U	0.26	12.4		0.12	2070		40.9	0.86	U	0.86
F-1	J1JCV2	5/26/11	0.0073	B	0.0057	0.26	U	0.26	12.8		0.12	1660		40.2	0.84	U	0.84
F-3	J1JCV4	5/26/11	0.0057	U	0.0057	0.25	U	0.25	13.9		0.12	1690		39.4	0.83	U	0.83
F-4	J1JCV5	5/26/11	0.0054	U	0.0054	0.25	U	0.25	11.4		0.12	2120		39.3	0.82	U	0.82
F-5	J1JCV6	5/26/11	0.0053	U	0.0053	0.24	U	0.24	12.6		0.11	1900		37.2	0.78	U	0.78
F-6	J1JCV7	5/26/11	0.0054	U	0.0054	0.27	U	0.27	14.3		0.13	2350		42.1	0.88	U	0.88
F-7	J1JCV8	5/26/11	0.0053	U	0.0053	0.24	U	0.24	12.4		0.11	2160		37.9	0.80	U	0.80
F-8	J1JCV9	5/26/11	0.0057	U	0.0057	0.25	U	0.25	12.3		0.12	1480		40.2	0.84	U	0.84
F-9	J1JCW0	5/26/11	0.0067	B	0.0057	0.24	U	0.24	12.4		0.11	1390		37.6	0.79	U	0.79
F-10	J1JCW1	5/26/11	0.0094	B	0.0050	0.26	U	0.26	14.9		0.13	1540		41.7	0.87	U	0.87
F-11	J1JCW2	5/26/11	0.0052	U	0.0052	0.24	U	0.24	10.6		0.11	1090		38.1	0.80	U	0.80
F-12	J1JCW3	5/26/11	0.0053	U	0.0053	0.23	U	0.23	13.2		0.11	1930		36.7	0.77	U	0.77
Equipment blank	J1B853	6/30/10	0.029	U	0.030	0.834	U	0.83	2.09	U	2.09	33	B	83.4	0.25	U	0.25
Equipment blank	J1JCW5	5/26/11	0.0054	U	0.0054	0.25	U	0.25	0.16	B	0.12	48.6	B	38.7	0.81	U	0.81

Attachment	1	Sheet No.	8 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc			TPH - diesel range		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	647		5.01	0.835	U	0.835	197		41.8	36.9		0.835	43.9		2.51	3380	U	3380
Duplicate of J1B856	J1B866	6/30/10	1090		4.71	0.784	U	0.784	215		39.2	38.6		0.784	44.1		2.35	3340	U	3340
A1	J1B854	6/30/10	1150		5.24	0.874	U	0.874	244		43.7	50.0		0.874	40.5		2.62	3330	U	3330
A2	J1B855	6/30/10	1210		5.07	0.844	U	0.844	228		42.2	45.6		0.844	43		2.53	3280	U	3280
A4	J1B857	6/30/10	1110		4.92	0.82	U	0.820	226		41.0	43.4		0.820	50.7		2.46	3320	U	3320
A5	J1B858	6/30/10	537		5.22	0.87	U	0.870	199		43.5	42.8		0.870	43.8		2.61	3380	U	3380
A6	J1B859	6/30/10	618		5.13	0.855	U	0.855	193		42.7	41.6		0.855	50.1		2.56	3210	U	3210
A7	J1B860	6/30/10	1190		5.07	0.845	U	0.845	240		42.3	41.1		0.845	48.7		2.54	3300	U	3300
A8	J1B861	6/30/10	1040		5.04	0.839	U	0.839	206		42.0	41.3		0.839	42		2.52	3290	U	3290
A9	J1B862	6/30/10	1050		4.02	0.669	U	0.669	238		33.5	40.7		0.669	49.3		2.01	3300	U	3300
A-9[a]	J1JVX2	6/16/11	254	N	5.2	0.15	U	0.15	230		54.6	38.1		0.15	49.3	X	0.37	8400	N	680
A10	J1B863	6/30/10	1510		5.69	0.949	U	0.949	201		47.4	44.8		0.949	58.5		2.85	3460	U	3460
A11	J1B864	6/30/10	494		4.07	0.678	U	0.678	313		33.9	50.7		0.678	43.2		2.04	3210	U	3210
A12	J1B865	6/30/10	914		4.93	0.822	U	0.822	377		41.1	54.8		0.822	47.4		2.47	3260	U	3260
B8	J1B887	6/29/10	1450		4.47	0.744	U	0.744	217		37.2	44.4		0.744	41.9		2.23	3430	U	3430
Duplicate of J1B892	J1B892	6/29/10	1360		4.57	0.762	U	0.762	231		38.1	44.9		0.762	43.5		2.29	3400	U	3400
B1	J1B880	6/29/10	1450		5.02	0.836	U	0.836	208		41.8	46.5		0.836	45.8		2.51	3310	U	3310
B2	J1B881	6/29/10	1450		4.81	0.801	U	0.801	206		40.0	42.8		0.801	38.6		2.4	3420	U	3420
B3	J1B882	6/29/10	1360		4.27	0.711	U	0.711	207		35.6	44.9		0.711	37.7		2.13	3300	U	3300
B4	J1B883	6/29/10	1620		5.42	0.904	U	0.904	215		45.2	44.9		0.904	41.1		2.71	3330	U	3330
B13[b]	J1B884	6/29/10	1700		6.07	1.01	U	1.01	248		50.6	47.8		1.01	42.4		3.04	3410	U	3410
B6	J1B885	6/29/10	1610		5.7	0.95	U	0.95	322		47.5	46.8		0.95	42.2		2.85	3250	U	3250
B7	J1B886	6/29/10	1400		4.51	0.752	U	0.752	259		37.6	46.9		0.752	39.3		2.26	3330	U	3330
B9	J1B888	6/29/10	1480		4.89	0.814	U	0.814	221		40.7	44		0.814	41.8		2.44	3210	U	3210
B10	J1B889	6/29/10	1430		5.26	0.877	U	0.877	219		43.9	42.4		0.877	39.2		2.63	3330	U	3330
B11	J1B890	6/29/10	1440		4.81	0.801	U	0.801	226		40.1	44.5		0.801	44.5		2.4	3320	U	3320
B12	J1B891	6/29/10	1490		5.09	0.848	U	0.848	274		42.4	50.2		0.848	47		2.54	3510	U	3510
C8	J1B8B0	6/29/10	1080	J	4.07	0.678	U	0.678	233		33.9	46.2	J	0.678	38.5		2.03	3240	U	3240
Duplicate of J1B8B0	J1B8B5	6/29/10	1100	J	4.13	0.688	U	0.688	244		34.4	46.6	J	0.688	40.2		2.06	3310	U	3310
C1	J1B893	6/17/10	475		4.27	0.711	U	0.711	229		35.6	46.4		0.711	44.2		2.13	9300		3410
C2	J1B894	6/17/10	952		4.51	0.751	U	0.751	225		37.5	40.6		0.751	43.4		2.25	8630		3390
C3	J1B895	6/17/10	535		3.86	0.644	U	0.644	206		32.2	41.3		0.644	40.1		1.93	3390	U	3390
C4	J1B896	6/17/10	774		4.94	0.823	U	0.823	240		41.1	49.6		0.823	44.9		2.47	3370	U	3370
C5	J1B897	6/17/10	599		5.36	0.894	U	0.894	204		44.7	43.3		0.894	44.6		2.68	3500	U	3500
C6	J1B8B1	6/17/10	944		5.02	0.837	U	0.837	224		41.9	47.7		0.837	47.3		2.51	3570	U	3570
C7	J1B899	6/29/10	1000	J	4.64	0.774	U	0.774	267		38.7	44.3	J	0.774	39.4		2.32	3340	U	3340
C9	J1B898	6/29/10	1410	J	4.57	0.762	U	0.762	260		38.1	50.1	J	0.762	41.9		2.29	3330	U	3330
C10	J1B8B2	6/29/10	1060	J	3.94	0.657	U	0.657	244		32.9	38.1	J	0.657	44.8		1.97	5320		3320
C11	J1B8B3	6/29/10	1170	J	4.52	0.753	U	0.753	201		37.6	36.4	J	0.753	35.6		2.26	3340	U	3340
C12	J1B8B4	6/29/10	1230	J	4.59	0.765	U	0.765	204		38.2	42.1	J	0.765	38.8		2.29	7630		3310

Attachment	1	Sheet No.	9 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc			TPH - diesel range		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
D5	J1B8C0	6/29/10	1490	J	4.76	0.793	U	0.793	267		39.6	47.8	J	0.793	42.5		2.38	3320	U	3320
Duplicate of J1B8C0	J1B8C8	6/29/10	1410	J	4.49	0.749	U	0.749	277		37.4	49.0	J	0.749	43.9		2.25	3580	U	3580
D1	J1B8B6	6/29/10	1420	J	4.46	0.743	U	0.743	220		37.1	41.7	J	0.743	42.6		2.23	3300	U	3300
D2	J1B8B7	6/29/10	1220	J	5.94	0.990	U	0.990	304		49.5	39.4	J	0.990	38.7		2.97	8970		3350
D3	J1B8B8	6/29/10	1190	J	4.06	0.677	U	0.677	249		33.8	39.8	J	0.677	37		2.03	3340	U	3340
D4	J1B8B9	6/29/10	1450	J	5.28	0.881	U	0.881	284		44.0	58.4	J	0.881	40.7		2.64	3470	U	3470
D6	J1B8C1	6/29/10	1150	J	4.79	0.798	U	0.798	304		39.9	48.4	J	0.798	36.9		2.40	1060	J	3270
D7	J1B8C2	6/29/10	1100	J	4.08	0.680	U	0.680	254		34.0	52.5	J	0.680	39.5		2.04	3370	U	3370
D8	J1B8C3	6/29/10	1010	J	4.08	0.680	U	0.680	240		34.0	58.2	J	0.680	36.3		2.04	925	J	3320
D9	J1B8C4	6/29/10	1430	J	4.84	0.806	U	0.806	228		40.3	43.0	J	0.806	39.9		2.42	3400	U	3400
D10	J1B8C5	6/29/10	1300	J	4.93	0.822	U	0.822	330		41.1	49.4	J	0.822	42.8		2.47	5210		3210
D11	J1B8C6	6/29/10	1110	J	3.81	0.635	U	0.635	292		31.7	45.7	J	0.635	38.5		1.90	28800		3270
D12	J1B8C7	6/29/10	1270	J	4.54	0.757	U	0.757	243		37.9	50.2	J	0.757	36.5		2.27	3210	U	3210
E-6	J1JCT4	5/31/11	99.9		4.9	0.14	U	0.14	217		50.7	35.9		0.081	39.6	X	0.34	690	U	690
Duplicate of J1JCT4	J1JCV1	5/31/11	215		5.5	0.16	U	0.16	214		57.2	38.0		0.091	40.5	X	0.39	660	U	660
E-1	J1JCR9	5/31/11	202	N	6.2	0.17	U	0.17	226		64.4	46.6		0.10	35.1	X	0.43	770	U	770
E-2	J1JCT0	5/31/11	142		5.0	0.14	U	0.14	217		51.9	38.1		0.083	34	X	0.35	160000		670
E-3	J1JCT1	5/31/11	279		5.7	0.16	U	0.16	278		58.9	41.8		0.094	37.5	X	0.40	680	U	680
E-4	J1JCT2	5/31/11	116		5.2	0.15	U	0.15	200		54.7	37.8		0.087	29.8	X	0.37	3700	J	670
E-5	J1JCT3	5/31/11	138		4.9	0.14	U	0.14	185		51.4	36.0		0.082	30.9	X	0.35	670	U	670
E-7	J1JCT5	5/31/11	125		5.5	0.15	U	0.15	175		56.9	36.3		0.091	31.8	X	0.38	680	U	680
E-8	J1JCT6	5/31/11	241		5.3	0.15	U	0.15	214		54.9	35.6		0.087	39	X	0.37	680	U	680
E-9	J1JCT7	5/31/11	184		5.4	0.15	U	0.15	196		56.6	41.0		0.090	31.5	X	0.38	650	U	650
E-10	J1JCT8	5/31/11	197		5.5	0.15	U	0.15	198		57.1	33.8		0.091	34.1	X	0.39	680	U	680
E-11	J1JCT9	5/31/11	167		5.4	0.15	U	0.15	192		56.7	37.3		0.090	31.2	X	0.38	690	U	690
E-12	J1JCV0	5/31/11	147		5.7	0.16	U	0.16	206		59.5	44.0		0.095	37	X	0.40	680	U	680
F-2	J1JCV3	5/26/11	317		5.6	0.16	U	0.16	197		58.4	38.1		0.093	39.8		0.39	700	U	700
Duplicate of J1JCV3	J1JCW4	5/26/11	289		5.6	0.16	U	0.16	195		58.8	37.8		0.094	40.3		0.40	650	U	650
F-1	J1JCV2	5/26/11	274	N	5.6	0.16	U	0.16	239		57.9	38.5		0.092	38.8		0.39	650	J	650
F-3	J1JCV4	5/26/11	319		5.4	0.15	U	0.15	274		56.7	38.6		0.090	39		0.38	690	U	690
F-4	J1JCV5	5/26/11	283		5.4	0.15	U	0.15	227		56.6	38.7		0.090	41.9		0.38	700	U	700
F-5	J1JCV6	5/26/11	409		5.1	0.15	U	0.15	272		53.6	40.0		0.085	39.6		0.36	660	U	660
F-6	J1JCV7	5/26/11	268		5.8	0.16	U	0.16	223		60.5	40.4		0.096	43.8		0.41	690	U	690
F-7	J1JCV8	5/26/11	304		5.2	0.15	U	0.15	248		54.6	41.7		0.087	42		0.37	690	U	690
F-8	J1JCV9	5/26/11	281		5.5	0.16	U	0.16	237		57.8	41.0		0.092	37.8		0.39	11000		680
F-9	J1JCW0	5/26/11	250		5.2	0.15	U	0.15	306		54.1	40.1		0.086	37.6		0.37	4300		670
F-10	J1JCW1	5/26/11	353		5.8	0.16	U	0.16	355		60.0	42.0		0.096	38.4		0.40	2800	J	660
F-11	J1JCW2	5/26/11	281		5.3	0.15	U	0.15	259		54.8	40.1		0.087	33		0.37	24000		650
F-12	J1JCW3	5/26/11	307		5.1	0.14	U	0.14	278		52.8	41.2		0.084	41.6		0.36	4600		680
Equipment blank	J1B853	6/30/10	172		5.0	0.834	U	0.83	41.7	U	41.7	0.212	B	0.83	1.05	B	2.5	9470	U	9470
Equipment blank	J1JCW5	5/26/11	102		5.3	0.15	U	0.15	55.7	U	55.7	0.38	B	0.089	1.4		0.38	3100	J	640

Attachment	1	Sheet No.	10 of 45
Originator	J. D. Skoglie	Date	9/13/11
Checked	T. E. Queen	Date	9/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	1

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	TPH - motor oil (high boiling)			TPH - diesel range EXT			Percent Moisture	Percent Solids
			ug/kg	Q	PQL	ug/kg	Q	PQL		
A3	J1B856	6/30/10	21100		10100					98.1
Duplicate of J1B856	J1B866	6/30/10	31400		10000					98.1
A1	J1B854	6/30/10	8010	J	9980					98.7
A2	J1B855	6/30/10	24800		9850					98.7
A4	J1B857	6/30/10	54300		9960					100
A5	J1B858	6/30/10	12400		10100					97.4
A6	J1B859	6/30/10	26900		9620					99.1
A7	J1B860	6/30/10	70400		9900					97
A8	J1B861	6/30/10	21400		9870					99.3
A9	J1B862	6/30/10	79400		9900					99.6
A-9[a]	J1JVX2	6/16/11				24000	N	1000		
A10	J1B863	6/30/10	14100		10400					95.8
A11	J1B864	6/30/10	13500		9640					98.3
A12	J1B865	6/30/10	12400		9780					98.1
B8	J1B887	6/29/10	9720	J	10300					96
Duplicate of J1B892	J1B892	6/29/10	8470	J	10200					95.1
B1	J1B880	6/29/10	57000		9940					99.7
B2	J1B881	6/29/10	8480	J	10200					97.5
B3	J1B882	6/29/10	6540	J	9890					99
B4	J1B883	6/29/10	5880	J	10000					97.1
B13[b]	J1B884	6/29/10	10700		10200					96.9
B6	J1B885	6/29/10	8600	J	9760					99.3
B7	J1B886	6/29/10	4230	J	10000					99.2
B9	J1B888	6/29/10	13600		9630					97.4
B10	J1B889	6/29/10	13200		9990					100
B11	J1B890	6/29/10	5890	J	9970					97.5
B12	J1B891	6/29/10	26000		10500					93.6
C8	J1B8B0	6/29/10	9130	J	9710					99.6
Duplicate of J1B8B0	J1B8B5	6/29/10	11600	J	9920					99.5
C1	J1B893	6/17/10	36400		10200					93.7
C2	J1B894	6/17/10	29500		10200					97.9
C3	J1B895	6/17/10	10200	U	10200					98.3
C4	J1B896	6/17/10	10100	U	10100					98
C5	J1B897	6/17/10	13400		10500					94.8
C6	J1B8B1	6/17/10	4060	J	10700					91.9
C7	J1B899	6/29/10	10000	UJ	10000					99.4
C9	J1B898	6/29/10	17200	J	9990					97.9
C10	J1B8B2	6/29/10	18500	J	9960					98.8
C11	J1B8B3	6/29/10	5430	J	10000					99.1
C12	J1B8B4	6/29/10	16000	J	9920					99.1

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	TPH - motor oil (high boiling)			TPH - diesel range EXT			% Moisture	% Solids
			ug/kg	Q	PQL	ug/kg	Q	PQL		
D5	J1B8C0	6/29/10	9950	UJ	9950					98.5
Duplicate of J1B8C0	J1B8C8	6/29/10	10700	UJ	10700					92.8
D1	J1B8B6	6/29/10	9900	UJ	9900					99
D2	J1B8B7	6/29/10	29300	J	10000					97.1
D3	J1B8B8	6/29/10	6970	J	10000					99.8
D4	J1B8B9	6/29/10	4970	J	10400					93.1
D6	J1B8C1	6/29/10	3590	J	9800					99.4
D7	J1B8C2	6/29/10	4800	J	10100					98
D8	J1B8C3	6/29/10	6810	J	9950					99.3
D9	J1B8C4	6/29/10	10200	UJ	10200					95.5
D10	J1B8C5	6/29/10	25100	J	9630					99.7
D11	J1B8C6	6/29/10	66700	J	9810					98.5
D12	J1B8C7	6/29/10	6450	J	9650					98.5
E-6	J1JCT4	5/31/11	1600	J	1000				3.1	
Duplicate of J1JCT4	J1JCV1	5/31/11	980	U	980				2.7	
E-1	J1JCR9	5/31/11	1100	U	1100				12.7	
E-2	J1JCT0	5/31/11	380000		990				1.1	
E-3	J1JCT1	5/31/11	1000	U	1000				1.9	
E-4	J1JCT2	5/31/11	12000		980				1	
E-5	J1JCT3	5/31/11	2700	J	990				0.97	
E-7	J1JCT5	5/31/11	1900	J	1000				1.2	
E-8	J1JCT6	5/31/11	1000	U	1000				1.3	
E-9	J1JCT7	5/31/11	960	U	960				0.78	
E-10	J1JCT8	5/31/11	1900	J	1000				2.5	
E-11	J1JCT9	5/31/11	1000	J	1000				2.7	
E-12	J1JCV0	5/31/11	1000	U	1000				0.76	
F-2	J1JCV3	5/26/11	1100	J	1000				4.7	
Duplicate of J1JCV3	J1JCW4	5/26/11	1200	J	960				4.5	
F-1	J1JCV2	5/26/11	1400	J	950				3.9	
F-3	J1JCV4	5/26/11	1200	J	1000				4.5	
F-4	J1JCV5	5/26/11	1100	J	1000				6.1	
F-5	J1JCV6	5/26/11	1400	J	980				4.2	
F-6	J1JCV7	5/26/11	1000	J	1000				4.5	
F-7	J1JCV8	5/26/11	1000	U	1000				3.4	
F-8	J1JCV9	5/26/11	26000		1000				3.8	
F-9	J1JCW0	5/26/11	7500		990				3.5	
F-10	J1JCW1	5/26/11	7600		970				3.6	
F-11	J1JCW2	5/26/11	25000		960				3	
F-12	J1JCW3	5/26/11	8400		1000				3.6	
Equipment blank	J1B853	6/30/10	99.9						3160	
Equipment blank	J1JCW5	5/26/11	3300	J	940				0.1	

Attachment	1	Sheet	12 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B856			J1B866			J1B854			J1B855			J1B857			J1B858			J1B859		
		A3			Duplicate of J1B856			A1			A2			A4			A5			A6		
		6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.38	U	3.38	3.34	U	3.34	1.81	J	3.32	3.28	U	3.28	3.32	U	3.32	0.844	J	3.37	3.37		3.20
Acenaphthylene	PAH	3.38	U	3.38	3.34	U	3.34	3.32	U	3.32	3.28	U	3.28	3.65		3.32	2.53	J	3.37	3.20	U	3.20
Anthracene	PAH	4.22		3.38	3.51		3.34	3.32	U	3.32	3.28	U	3.28	1.33	J	3.32	1.18	J	3.37	5.93		3.20
Benzo(a)anthracene	PAH	32.7		3.38	32.4		3.34	3.04	J	3.32	4.51		3.28	23.9		3.32	15.3		3.37	51.4		3.20
Benzo(a)pyrene	PAH	47.1		3.38	75.7		3.34	6.65		3.32	8.07		3.28	51.5		3.32	55		3.37	88.0		3.20
Benzo(b)fluoranthene	PAH	30.2		3.38	43.8		3.34	5.79		3.32	6.02		3.28	34.4		3.32	40.3		3.37	60.0		3.20
Benzo(ghi)perylene	PAH	26.6		3.38	44.3		3.34	4.84		3.32	5.76		3.28	39.7		3.32	51.9		3.37	51.0		3.20
Benzo(k)fluoranthene	PAH	14.9		3.38	21.0		3.34	2.56	J	3.32	2.84	J	3.28	15.1		3.32	16.5		3.37	29.9		3.20
Chrysene	PAH	31.9		3.38	32.0		3.34	1.96	J	3.32	4.04		3.28	18.1		3.32	12.8		3.37	46.3		3.20
Dibenz[a,h]anthracene	PAH	5.19		3.38	7.67		3.34	3.32	U	3.32	1.07	J	3.28	6.87		3.32	7.13		3.37	9.75		3.20
Fluoranthene	PAH	99.3		3.38	114		3.34	3.32	U	3.32	3.28	U	3.28	65.7		3.32	40.1		3.37	179		3.20
Fluorene	PAH	2.87	J	3.38	2.51	J	3.34	3.32	U	3.32	3.28	U	3.28	1.49	J	3.32	3.37	U	3.37	2.73	J	3.20
Indeno(1,2,3-cd)pyrene	PAH	16.9		3.38	46.4		3.34	2.93	J	3.32	5.17		3.28	45.9		3.32	48.1		3.37	56.4		3.20
Naphthalene	PAH	3.38	U	3.38	3.34	U	3.34	3.32	U	3.32	3.28	U	3.28	5.48		3.32	3.55		3.37	3.2	U	3.20
Phenanthrene	PAH	50.0		3.38	34.8		3.34	3.16	J	3.32	2.79	J	3.28	15.6		3.32	12		3.37	50.7		3.20
Pyrene	PAH	96.4		3.38	99.2		3.34	8.01		3.32	9.80		3.28	66		3.32	40.5		3.37	184		3.20
Aldrin	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Alpha-BHC	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
alpha-Chlordane	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
beta-BHC	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Delta-BHC	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
4,4'-DDD	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
4,4'-DDE	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
4,4'-DDT	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Dieldrin	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endosulfan I	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	JD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endosulfan II	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endosulfan sulfate	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endrin	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endrin aldehyde	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endrin ketone	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Gamma-BHC (Lindane)	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
gamma-Chlordane	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Heptachlor	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Heptachlor epoxide	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Methoxychlor	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Toxaphene	PEST	18.9	UD	18.9	19.7	UD	19.7	20.1	UD	20.1	20.2	UD	20.2	19.4	UD	19.4	19.1	UD	19.1	19.9	UD	19.9

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B860			J1B861			J1B862			J1JVX2			J1B863			J1B864			J1B865			J1B887			J1B892		
		A7			A8			A9			A9[a]			A10			A11			A12			B8			Duplicate of J1B887		
		6/30/10			6/30/10			6/30/10			6/16/11			6/30/10			6/30/10			6/30/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	2.81	J	3.3	3.29	U	3.29	13.2		3.3	9.2	U	9.2	10.9		3.46	3.21	U	3.21	3.26	U	3.26	1.38	J	3.44	3.38	U	3.38
Acenaphthylene	PAH	3.3	U	3.3	3.29	U	3.29	3.3	U	3.3	8.3	U	8.3	3.46	U	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Anthracene	PAH	3.63		3.3	2.3	J	3.29	2.64	J	3.3	2.8	U	2.8	1.21	J	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Benzo(a)anthracene	PAH	39.0		3.3	28.2		3.29	35.4		3.3	31	X	2.9	26.7		3.46	9.00		3.21	6.2		3.26	10.9		3.44	4.06		3.38
Benzo(a)pyrene	PAH	63.9		3.3	43.8		3.29	60.8		3.3	58		5.9	48.8		3.46	17.0		3.21	10.7		3.26	12.9		3.44	6.34		3.38
Benzo(b)fluoranthene	PAH	46.8		3.3	30.6		3.29	50.9		3.3	34		3.9	30.9		3.46	15.3		3.21	11.9		3.26	10.5		3.44	5.33		3.38
Benzo(ghi)perylene	PAH	37.7		3.3	26.3		3.29	38.5		3.3	38		6.6	28.0		3.46	13.9		3.21	7.81		3.26	9.60		3.44	8.01		3.38
Benzo(k)fluoranthene	PAH	21.9		3.3	15		3.29	23.2		3.3	25		3.6	15.1		3.46	6.44		3.21	4.19		3.26	4.85		3.44	2.30	J	3.38
Chrysene	PAH	37.2		3.3	26.2		3.29	29		3.3	36	J	4.5	28.3		3.46	8.53		3.21	4.12		3.26	9.67		3.44	3.94		3.38
Dibenz[a,h]anthracene	PAH	7.1		3.3	4.31		3.29	8.04		3.3	10	U	10	5.26		3.46	1.98	J	3.21	1.26	J	3.26	1.62	J	3.44	3.38	U	3.38
Fluoranthene	PAH	157		3.3	99.7		3.29	108		3.3	34	JX	12	59.0		3.46	25.4		3.21	17.1		3.26	35.6		3.44	10.1		3.38
Fluorene	PAH	1.82	J	3.3	1.2	J	3.29	1.16	J	3.3	4.9	U	4.9	3.46	U	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Indeno(1,2,3-cd)pyrene	PAH	40.4		3.3	25.5		3.29	40.4		3.3	38		11	30.5		3.46	5.93		3.21	5.36		3.26	10.1		3.44	4.21		3.38
Naphthalene	PAH	3.3	U	3.3	3.29	U	3.29	3.3	U	3.3	11	U	11	3.46	U	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Phenanthrene	PAH	57.1		3.3	32.2		3.29	26.7		3.3	14	J	11	11.2		3.46	7.07		3.21	4.89		3.26	10.7		3.44	4.06		3.38
Pyrene	PAH	141		3.3	92.5		3.29	117		3.3	58		11	62.2		3.46	27.2		3.21	16.2		3.26	25.6		3.44	11.9		3.38
Aldrin	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.23	U	0.23	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Alpha-BHC	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.20	U	0.20	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
alpha-Chlordane	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.30	U	0.30	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
beta-BHC	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.62	U	0.62	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Delta-BHC	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.37	U	0.37	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
4,4'-DDD	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.51	U	0.51	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
4,4'-DDE	PEST	1.37	UD	1.37	1.32	UD	1.32	5.55	JD	1.3	0.29	JX	0.22	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
4,4'-DDT	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.55	U	0.55	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Dieldrin	PEST	1.37	UD	1.37	1.32	UD	1.32	68.2	D	1.3	0.20	U	0.20	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endosulfan I	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.16	U	0.16	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endosulfan II	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.27	U	0.27	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endosulfan sulfate	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.26	U	0.26	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endrin	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.29	U	0.29	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endrin aldehyde	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.16	U	0.16	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endrin ketone	PEST	1.37	UD	1.37	1.32	UD	1.32	1.63	JD	1.3	0.46	U	0.46	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.43	U	0.43	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
gamma-Chlordane	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.25	U	0.25	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Heptachlor	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.20	U	0.20	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Heptachlor epoxide	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.40	U	0.40	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Methoxychlor	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.42	U	0.42	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Toxaphene	PEST	20.5	UD	20.5	19.9	UD	19.9	19.6	UD	19.6	15	U	15	20.0	UD	20.0	19.2	UD	19.2	20	UD	20	20.5	UD	20.5	20.2	UD	20.2

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B880			J1B881			J1B882			J1B883			J1B884			J1B885			J1B886			J1B888			J1B889		
		B1			B2			B3			B4			B13[b]			B6			B7			B9			B10		
		6/30/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	1.18	J	3.37	1.34	J	3.35	35.0		3.35	3.30	U	3.30	3.37	U	3.44	178		3.33
Acenaphthylene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	3.37	U	3.37	3.35	U	3.35	3.35	U	3.35	3.30	U	3.30	3.37	U	3.44	3.33	U	3.33
Anthracene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	3.37	U	3.37	1.26	J	3.35	1.01	J	3.35	3.30	U	3.30	3.37	U	3.44	2.83	J	3.33
Benzo(a)anthracene	PAH	2.97	J	3.32	5.74		3.41	3.52		3.36	13.1		3.37	15.9		3.35	19.2		3.35	3.30	U	3.30	2.78	J	3.44	14.8		3.33
Benzo(a)pyrene	PAH	3.83		3.32	6.17		3.41	2.86	J	3.36	19.7		3.37	24.1		3.35	24.5		3.35	3.30	U	3.30	4.64		3.44	18.7		3.33
Benzo(b)fluoranthene	PAH	5.05		3.32	5.01		3.41	2.27	J	3.36	12.1		3.37	17.8		3.35	20.4		3.35	3.30	U	3.30	3.00	J	3.44	15.30		3.33
Benzo(ghi)perylene	PAH	5.33		3.32	4.54		3.41	2.00	J	3.36	15.4		3.37	18.2		3.35	20.8		3.35	3.30	U	3.30	4.32		3.44	13.1		3.33
Benzo(k)fluoranthene	PAH	1.79	J	3.32	2.78	J	3.41	1.30	J	3.36	6.93		3.37	8.72		3.35	9.91		3.35	3.30	U	3.30	1.87	J	3.44	7.03		3.33
Chrysene	PAH	1.94	J	3.32	3.33	J	3.41	2.02	J	3.36	7.17		3.37	7.31		3.35	9.79		3.35	3.30	U	3.30	0.861	J	3.44	22.0		3.33
Dibenz[a,h]anthracene	PAH	1.06	J	3.32	3.41	U	3.41	3.36	U	3.36	2.34	J	3.37	3.30	J	3.35	3.79		3.35	3.30	U	3.30	3.37	U	3.44	1.97	J	3.33
Fluoranthene	PAH	9.63		3.32	8.03		3.41	3.70		3.36	19.6		3.37	30.1		3.35	89.7		3.35	3.30	U	3.30	6.08		3.44	37.0		3.33
Fluorene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	2.19	J	3.37	3.35	U	3.35	3.35	U	3.35	3.30	U	3.30	3.37	U	3.44	11.8		3.33
Indeno(1,2,3-cd)pyrene	PAH	2.04	J	3.32	5.13		3.41	1.16	J	3.36	15.1		3.37	20.7		3.35	23.3		3.35	3.30	U	3.30	3.21	J	3.44	9.68		3.33
Naphthalene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	3.37	U	3.37	3.35	U	3.35	3.35	U	3.35	3.30	U	3.30	3.37	U	3.44	3.33	U	3.33
Phenanthrene	PAH	5.81		3.32	2.73	J	3.41	2.61	J	3.36	9.95		3.37	8.48		3.35	19.8		3.35	3.30	U	3.30	3.54		3.44	44.5		3.33
Pyrene	PAH	18.5		3.32	14.4		3.41	4.78		3.36	31.0		3.37	33.6		3.35	59.2		3.35	3.30	U	3.30	5.65		3.44	40.7		3.33
Aldrin	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Alpha-BHC	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
alpha-Chlordane	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
beta-BHC	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Delta-BHC	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
4,4'-DDD	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
4,4'-DDE	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
4,4'-DDT	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Dieldrin	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endosulfan I	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endosulfan II	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endosulfan sulfate	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endrin	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endrin aldehyde	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endrin ketone	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
gamma-Chlordane	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Heptachlor	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Heptachlor epoxide	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Methoxychlor	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Toxaphene	PEST	20.1	UD	20.1	20.5	UD	20.5	20.2	UD	20.2	19.8	UD	19.8	20.6	UD	20.6	19.9	UD	19.9	20.0	UD	20.0	20.4	UD	20.4	19.8	UD	19.8

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B890			J1B891			J1B8B0			J1B8B5			J1B893			J1B894			J1B895			J1B896		
		B11			B12			C8			Duplicate of J1B8B0			C1			C2			C3			C4		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/17/10			6/17/10			6/17/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.41	U	3.41	15.8		3.51	68.2		3.29	3.30	U	3.30	12.5		3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Acenaphthylene	PAH	3.41	U	3.41	1.58	J	3.51	3.29	U	3.29	3.30	U	3.30	3.53	U	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Anthracene	PAH	3.41	U	3.41	1.76	J	3.51	3.54		3.29	3.30	U	3.30	1.59	J	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(a)anthracene	PAH	4.66		3.41	14.4		3.51	85.7	J	3.29	2.89	J	3.30	13.4		3.53	3.14	J	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(a)pyrene	PAH	8.51		3.41	17.2		3.51	50.8	J	3.29	4.16	J	3.30	11.1		3.53	2.48	J	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(b)fluoranthene	PAH	8.68		3.41	22.1		3.51	85.1	J	3.29	5.00	J	3.30	4.24		3.53	3.47		3.30	3.34	U	3.34	3.37	U	3.37
Benzo(ghi)perylene	PAH	12.6		3.41	9.70		3.51	26.6	J	3.29	3.27	J	3.30	90.1		3.53	1.82	J	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(k)fluoranthene	PAH	3.0	J	3.41	7.17		3.51	26.2		3.29	1.87	J	3.30	6.89		3.53	1.65	J	3.30	3.34	U	3.34	3.37	U	3.37
Chrysene	PAH	1.9	J	3.41	16.2		3.51	105	J	3.29	3.29	J	3.30	19.4		3.53	22.7		3.30	3.34	U	3.34	3.37	U	3.37
Dibenz[a,h]anthracene	PAH	1.02	J	3.41	2.18	J	3.51	5.20		3.29	3.30	U	3.30	3.53	U	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Fluoranthene	PAH	11.4		3.41	43.4		3.51	261	J	3.29	8.59	J	3.30	11.0		3.53	14.7		3.30	3.34	U	3.34	3.37	U	3.37
Fluorene	PAH	3.41	U	3.41	3.51	U	3.51	3.29	U	3.29	3.30	U	3.30	3.53	U	3.53	4.30		3.30	3.34	U	3.34	3.37	U	3.37
Indeno(1,2,3-cd)pyrene	PAH	8.84		3.41	5.60		3.51	22.5	J	3.29	1.39	J	3.30	9.19		3.53	7.44		3.30	3.34	U	3.34	3.37	U	3.37
Naphthalene	PAH	3.41	U	3.41	3.51	U	3.51	3.29	U	3.29	3.30	U	3.30	3.53	U	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Phenanthrene	PAH	4.69		3.41	16.2		3.51	50.3		3.29	4.46		3.30	26.5		3.53	9.26		3.30	3.34	U	3.34	3.37	U	3.37
Pyrene	PAH	10.7		3.41	40.5		3.51	181	J	3.29	5.95	J	3.30	35.5		3.53	6.12		3.30	3.34	U	3.34	3.37	U	3.37
Aldrin	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Alpha-BHC	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
alpha-Chlordane	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
beta-BHC	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Delta-BHC	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
4,4'-DDD	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
4,4'-DDE	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
4,4'-DDT	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Dieldrin	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endosulfan I	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endosulfan II	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endosulfan sulfate	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endrin	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endrin aldehyde	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endrin ketone	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Gamma-BHC (Lindane)	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
gamma-Chlordane	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Heptachlor	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Heptachlor epoxide	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Methoxychlor	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Toxaphene	PEST	20.4	UD	20.4	21.3	UD	21.3	19.3	UDJ	19.3	20.1	UDJ	20.1	21.2	UD	21.2	19.5	UD	19.5	19.5	UD	19.5	20.4	UD	20.4

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B897			J1B8B1			J1B899			J1B898			J1B8B2			J1B8B3			J1B8B4		
		C5			C6			C7			C9			C10			C11			C12		
		6/17/10			6/17/10			6/29/10			6/29/10			6/17/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	3.13	U	3.13	0.837	J	3.34	14.2		3.34	3.26	U	3.26
Acenaphthylene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	1.72	J	3.13	55.4		3.34	5.52		3.34	3.26	U	3.26
Anthracene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	2.67	J	3.13	3.34	U	3.34	3.34	U	3.34	3.26	U	3.26
Benzo(a)anthracene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	129	J	3.13	31.1	J	3.34	15.0	J	3.34	11.9	J	3.26
Benzo(a)pyrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	179	J	3.13	46.6	J	3.34	14.3	J	3.34	12.6	J	3.26
Benzo(b)fluoranthene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	190	J	3.13	47.3	J	3.34	10.7	J	3.34	11.7	J	3.26
Benzo(ghi)perylene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	116	J	3.13	34.3	J	3.34	10.6	J	3.34	8.93	J	3.26
Benzo(k)fluoranthene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	86.3		3.13	17.6		3.34	5.55		3.34	5.35		3.26
Chrysene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	99.9	J	3.13	30.3	J	3.34	8.18	J	3.34	8.66	J	3.26
Dibenz[a,h]anthracene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	18.6		3.13	7.14		3.34	1.61	J	3.34	1.47	J	3.26
Fluoranthene	PAH	2.19	J	2.19	11.0		3.59	3.16	UJ	3.16	149	J	3.13	100	J	3.34	29.4	J	3.34	24.5	J	3.26
Fluorene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	0.909	J	3.13	3.34	U	3.34	3.34	U	3.34	3.26	U	3.26
Indeno(1,2,3-cd)pyrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	121	J	3.13	35.3	J	3.34	14.7	J	3.34	10.9	J	3.26
Naphthalene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	3.13	U	3.13	3.34	U	3.34	3.34	U	3.34	3.26	U	3.26
Phenanthrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	19.3		3.13	33.3		3.34	9.70		3.34	8.97		3.26
Pyrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	262	J	3.13	104	J	3.34	33.3	J	3.34	30.5	J	3.26
Aldrin	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Alpha-BHC	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
alpha-Chlordane	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
beta-BHC	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Delta-BHC	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
4,4'-DDD	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
4,4'-DDE	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	2.9	JD	2.9	1.32	UD	1.32	1.34	UD	1.34
4,4'-DDT	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Dieldrin	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endosulfan I	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endosulfan II	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endosulfan sulfate	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endrin	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endrin aldehyde	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endrin ketone	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
gamma-Chlordane	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Heptachlor	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Heptachlor epoxide	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Methoxychlor	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Toxaphene	PEST	20.8	UD	20.8	21.5	UD	21.5	19.3	UDJ	19.3	20.4	UDJ	20.4	20.2	UDJ	20.2	19.9	UDJ	19.9	20.1	UDJ	20.1

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B856			J1B866			J1B854			J1B855			J1B857			J1B858			J1B859		
		A3			Duplicate of J1B856			A1			A2			A4			A5			A6		
		6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1221	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1232	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1242	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1248	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1254	PCB	3.61	J	3.61	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1260	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
1,2,4-Trichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
1,2-Dichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
1,3-Dichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
1,4-Dichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4,5-Trichlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4,6-Trichlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4-Dichlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4-Dimethylphenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4-Dinitrophenol	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
2,4-Dinitrotoluene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,6-Dinitrotoluene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Chloronaphthalene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Chlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Methylnaphthalene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Methylphenol (cresol, o-)	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Nitroaniline	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
2-Nitrophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
3+4 Methylphenol (cresol, m+p)	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
3,3'-Dichlorobenzidine	SVOA	638	U	638	653	U	653	663	U	663	633	U	633	657	U	657	674	U	674	662	U	662
3-Nitroaniline	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Bromophenylphenyl ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Chloro-3-methylphenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Chloroaniline	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Chlorophenylphenyl ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Nitroaniline	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
4-Nitrophenol	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
Acenaphthene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Acenaphthylene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Anthracene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Benzo(a)anthracene	SVOA	88.5	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	103	J	331
Benzo(a)pyrene	SVOA	115	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	110	J	331
Benzo(b)fluoranthene	SVOA	69.4	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	76.9	J	331
Benzo(ghi)perylene	SVOA	88.2	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	75.6	J	331

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B860			J1B861			J1B862			J1JVX2			J1B863			J1B864			J1B865			J1B887			J1B892		
		A7			A8			A9			A9[a]			A10			A11			A12			B8			Duplicate of J1B886		
		6/30/10			6/30/10			6/30/10			6/16/11			6/30/10			6/30/10			6/30/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	2.8	U	2.8	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1221	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	8.0	U	8.0	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1232	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	2.0	U	2.0	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1242	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	4.7	U	4.7	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1248	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	4.7	U	4.7	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1254	PCB	13.6	U	13.6	8.05	J	13.2	4.4	J	13	2.6	U	2.6	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1260	PCB	13.6	U	13.6	13.2	U	13.2	10.1	J	13	2.6	U	2.6	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
1,2,4-Trichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
1,2-Dichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	21	U	21	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
1,3-Dichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	11	U	11	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
1,4-Dichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	13	U	13	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4,5-Trichlorophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4,6-Trichlorophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4-Dichlorophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4-Dimethylphenol	SVOA	340	U	340	332	U	332	328	U	328	63	U	63	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4-Dinitrophenol	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	320	U	320	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
2,4-Dinitrotoluene	SVOA	340	U	340	332	U	332	328	U	328	63	U	63	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,6-Dinitrotoluene	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Chloronaphthalene	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Chlorophenol	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Methylnaphthalene	SVOA	340	U	340	332	U	332	328	U	328	18	U	18	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Methylphenol (cresol, o-)	SVOA	340	U	340	332	U	332	328	U	328	12	U	12	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Nitroaniline	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	47	U	47	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
2-Nitrophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
3+4 Methylphenol (cresol, m+p)	SVOA	340	U	340	332	U	332	328	U	328	31	U	31	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
3,3'-Dichlorobenzidine	SVOA	680	U	680	664	U	664	657	U	657	85	U	85	679	U	679	647	U	647	659	U	659	667	U	667	690	U	690
3-Nitroaniline	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	69	U	69	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	332	U	332	328	U	328	310	U	310	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Bromophenylphenyl ether	SVOA	340	U	340	332	U	332	328	U	328	18	U	18	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Chloro-3-methylphenol	SVOA	340	U	340	332	U	332	328	U	328	63	U	63	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Chloroaniline	SVOA	340	U	340	332	U	332	328	U	328	78	U	78	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Chlorophenylphenyl ether	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Nitroaniline	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	69	U	69	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
4-Nitrophenol	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	92	U	92	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
Acenaphthene	SVOA	340	U	340	332	U	332	328	U	328	9.8	U	9.8	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Acenaphthylene	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Anthracene	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(a)anthracene	SVOA	60.6	J	340	332	U	332	328	U	328	36	J	19	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(a)pyrene	SVOA	68	J	340	332	U	332	62.6	J	328	110	J	19	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(b)fluoranthene	SVOA	52.2	J	340	332	U	332	52.5	J	328	130	JK	25	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(ghi)perylene	SVOA	340	U	340	332	U	332	328	U	328	110	J	15	340	U	340	51.3	J	324	329	U	329	333	U	333	345	U	345

Attachment	1	Sheet No.	19 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B880			J1B881			J1B882			J1B883			J1B884			J1B885			J1B886			J1B888			J1B889		
		B1			B2			B3			B4			B13[b]			B6			B7			B9			B10		
		6/30/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1221	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1232	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1242	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1248	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1254	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	8.75	J	13.2
Aroclor-1260	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
1,2,4-Trichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
1,2-Dichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
1,3-Dichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
1,4-Dichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4,5-Trichlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4,6-Trichlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4-Dichlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4-Dimethylphenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4-Dinitrophenol	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
2,4-Dinitrotoluene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,6-Dinitrotoluene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Chloronaphthalene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Chlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Methylnaphthalene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Methylphenol (cresol, o-)	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Nitroaniline	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
2-Nitrophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
3+4 Methylphenol (cresol, m+p)	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
3,3'-Dichlorobenzidine	SVOA	649	U	649	672	U	672	661	U	661	644	U	644	651	U	651	641	U	641	663	U	663	665	U	665	618	U	618
3-Nitroaniline	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
4,6-Dinitro-2-methylphenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Bromophenylphenyl ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Chloro-3-methylphenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Chloroaniline	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Chlorophenylphenyl ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Nitroaniline	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
4-Nitrophenol	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
Acenaphthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Acenaphthylene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Anthracene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(a)anthracene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(a)pyrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(b)fluoranthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(ghi)perylene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B890			J1B891			J1B8B0			J1B8B5			J1B893			J1B894			J1B895			J1B896		
		B11			B12			C8			Duplicate of J1B8B0			C1			C2			C3			C4		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/17/10			6/17/10			6/17/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1221	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1232	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1242	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1248	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1254	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1260	PCB	13.6	U	13.6	3.73	J	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
1,2,4-Trichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
1,2-Dichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
1,3-Dichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
1,4-Dichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4,5-Trichlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4,6-Trichlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4-Dichlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4-Dimethylphenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4-Dinitrophenol	SVOA	1650	U	1650	1650	U	1650	1650	UJ	1650	1650	UJ	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
2,4-Dinitrotoluene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,6-Dinitrotoluene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Chloronaphthalene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Chlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Methylnaphthalene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Methylphenol (cresol, o-)	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Nitroaniline	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
2-Nitrophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
3+4 Methylphenol (cresol, m+p)	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
3,3'-Dichlorobenzidine	SVOA	660	U	660	661	U	661	661	U	661	662	U	662	698	U	698	674	U	674	663	U	663	673	U	673
3-Nitroaniline	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Bromophenylphenyl ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Chloro-3-methylphenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Chloroaniline	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Chlorophenylphenyl ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Nitroaniline	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
4-Nitrophenol	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
Acenaphthene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Acenaphthylene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Anthracene	SVOA	330	U	330	62.5	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(a)anthracene	SVOA	330	U	330	164	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(a)pyrene	SVOA	330	U	330	130	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(b)fluoranthene	SVOA	330	U	330	143	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(ghi)perylene	SVOA	330	U	330	93.8	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B897			J1B8B1			J1B899			J1B898			J1B8B2			J1B8B3			J1B8B4		
		C5			C6			C7			C9			C10			C11			C12		
		6/17/10			6/17/10			6/29/10			6/29/10			6/17/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1221	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1232	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1242	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1248	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1254	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1260	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	3.4	J	13.4	13.2	U	13.2	13.4	U	13.4
1,2,4-Trichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
1,2-Dichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
1,3-Dichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
1,4-Dichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4,5-Trichlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4,6-Trichlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4-Dichlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4-Dimethylphenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4-Dinitrophenol	SVOA	1740	U	1740	1790	U	1790	1660	UJ	1660	1600	UJ	1600	1630	UJ	1630	1640	UJ	1640	1570	UJ	1570
2,4-Dinitrotoluene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,6-Dinitrotoluene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Chloronaphthalene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Chlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Methylnaphthalene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Methylphenol (cresol, o-)	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Nitroaniline	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
2-Nitrophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
3+4 Methylphenol (cresol, m+p)	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
3,3'-Dichlorobenzidine	SVOA	695	U	695	716	U	716	663	U	663	640	U	640	654	U	654	655	U	655	630	U	630
3-Nitroaniline	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
4,6-Dinitro-2-methylphenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Bromophenylphenyl ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Chloro-3-methylphenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Chloroaniline	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Chlorophenylphenyl ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Nitroaniline	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
4-Nitrophenol	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
Acenaphthene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Acenaphthylene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Anthracene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Benzo(a)anthracene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	77.1	J	327	327	U	327	315	U	315
Benzo(a)pyrene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	83.7	J	327	327	U	327	315	U	315
Benzo(b)fluoranthene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	72.9	J	327	327	U	327	315	U	315
Benzo(ghi)perylene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	68.4	J	327	327	U	327	315	U	315

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B856			J1B866			J1B854			J1B855			J1B857			J1B858			J1B859		
		A3			Duplicate of J1B856			A1			A2			A4			A5			A6		
		6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	85	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	102	J	331
Bis(2-chloro-1-methylethyl)ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Bis(2-Chloroethoxy)methane	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Bis(2-chloroethyl) ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Bis(2-ethylhexyl) phthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Butylbenzylphthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Carbazole	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Chrysene	SVOA	108	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	115	J	331
Di-n-butylphthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Di-n-octylphthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Dibenz[a,h]anthracene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Dibenzofuran	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Diethyl phthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Dimethyl phthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Fluoranthene	SVOA	145	J	145	57	J	327	332	U	332	317	U	317	328	U	328	337	U	337	185	J	331
Fluorene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachlorobutadiene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachlorocyclopentadiene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachloroethane	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Indeno(1,2,3-cd)pyrene	SVOA	67.3	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	63.6	J	331
Isophorone	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
N-Nitroso-di-n-dipropylamine	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
N-Nitrosodiphenylamine	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Naphthalene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Nitrobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Pentachlorophenol	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
Phenanthrene	SVOA	84.8	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	67.9	J	331
Phenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Pyrene	SVOA	209	J	319	58.3	J	327	332	U	332	317	U	317	328	U	328	337	U	337	190	J	331

Attachment	1	Sheet No.	23 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B860			J1B861			J1B862			J1JVX2			J1B863			J1B864			J1B865			J1B887			J1B892		
		A7			A8			A9			A9*			A10			A11			A12			B8			Duplicate of J1B886		
		6/30/10			6/30/10			6/30/10			6/16/11			6/30/10			6/30/10			6/30/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	56.5	J	340	332	U	332	65.8	J	328	38	UK	38	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-chloro-1-methylethyl)ether	SVOA	340	U	340	332	U	332	328	U	328	22	U	22	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-Chloroethoxy)methane	SVOA	340	U	340	332	U	332	328	U	328	22	U	22	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-chloroethyl) ether	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-ethylhexyl) phthalate	SVOA	340	U	340	332	U	332	328	U	328	71	JB	44	144	J	340	324	U	324	329	U	329	333	U	333	345	U	345
Butylbenzylphthalate	SVOA	340	U	340	332	U	332	328	U	328	41	U	41	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Carbazole	SVOA	340	U	340	332	U	332	328	U	328	34	U	34	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Chrysene	SVOA	72.2	J	340	332	U	332	55.9	J	328	49	J	26	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Di-n-butylphthalate	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Di-n-octylphthalate	SVOA	340	U	340	332	U	332	328	U	328	14	U	14	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Dibenz[a,h]anthracene	SVOA	340	U	340	332	U	332	328	U	328	22	J	18	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Dibenzofuran	SVOA	340	U	340	332	U	332	328	U	328	19	U	19	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Diethyl phthalate	SVOA	340	U	340	332	U	332	328	U	328	25	U	25	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Dimethyl phthalate	SVOA	340	U	340	332	U	332	328	U	328	22	U	22	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Fluoranthene	SVOA	116	J	340	332	U	332	77.9	J	328	58	J	34	340	U	340	324	U	324	53.7	J	329	333	U	333	345	U	345
Fluorene	SVOA	340	U	340	332	U	332	328	U	328	17	U	17	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachlorobutadiene	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachlorocyclopentadiene	SVOA	340	U	340	332	U	332	328	U	328	47	U	47	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachloroethane	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Indeno(1,2,3-cd)pyrene	SVOA	340	U	340	332	U	332	328	U	328	75	J	21	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Isophorone	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
N-Nitroso-di-n-dipropylamine	SVOA	340	U	340	332	U	332	328	U	328	29	U	29	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
N-Nitrosodiphenylamine	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Naphthalene	SVOA	340	U	340	332	U	332	328	U	328	29	U	29	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Nitrobenzene	SVOA	340	U	340	332	U	332	328	U	328	21	U	21	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Pentachlorophenol	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	310	U	310	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
Phenanthrene	SVOA	340	U	340	332	U	332	328	U	328	28	J	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Phenol	SVOA	340	U	340	332	U	332	328	U	328	17	U	17	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Pyrene	SVOA	117	J	340	332	U	332	72.5	J	328	69	J	11	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B880			J1B881			J1B882			J1B883			J1B884			J1B885			J1B886			J1B888			J1B889		
		B1			B2			B3			B4			B13[b]			B6			B7			B9			B10		
		6/30/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-chloro-1-methylethyl)ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-Chloroethoxy)methane	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-chloroethyl) ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-ethylhexyl) phthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Butylbenzylphthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Carbazole	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Chrysene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Di-n-butylphthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Di-n-octylphthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Dibenz[a,h]anthracene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Dibenzofuran	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Diethyl phthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Dimethyl phthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Fluoranthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	62.5	J	309
Fluorene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachlorobutadiene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachlorocyclopentadiene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachloroethane	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Indeno(1,2,3-cd)pyrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Isophorone	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
N-Nitroso-di-n-dipropylamine	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
N-Nitrosodiphenylamine	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Naphthalene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Nitrobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Pentachlorophenol	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
Phenanthrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Phenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Pyrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	56	J	321	331	U	331	333	U	333	62.5	J	309

Attachment	1	Sheet No.	25 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B890			J1B891			J1B8B0			J1B8B5			J1B893			J1B894			J1B895			J1B896		
		B11			B12			C8			Duplicate of J1B8B0			C1			C2			C3			C4		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/17/10			6/17/10			6/17/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	330	U	330	113	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-chloro-1-methylethyl)ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-Chloroethoxy)methane	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-chloroethyl) ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-ethylhexyl) phthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Butylbenzylphthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Carbazole	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Chrysene	SVOA	330	U	330	160	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Di-n-butylphthalate	SVOA	330	U	330	330	U	330	331	UJ	331	331	UJ	331	349	U	349	337	U	337	332	U	332	336	U	336
Di-n-octylphthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Dibenz[a,h]anthracene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Dibenzofuran	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Diethyl phthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Dimethyl phthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Fluoranthene	SVOA	330	U	330	343		330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Fluorene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachlorobutadiene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachlorocyclopentadiene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachloroethane	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Indeno(1,2,3-cd)pyrene	SVOA	330	U	330	77.7	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Isophorone	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
N-Nitroso-di-n-dipropylamine	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
N-Nitrosodiphenylamine	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Naphthalene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Nitrobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Pentachlorophenol	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
Phenanthrene	SVOA	330	U	330	243	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Phenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Pyrene	SVOA	330	U	330	280	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336

Attachment 1 Sheet No. 26 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B897			J1B8B1			J1B899			J1B898			J1B8B2			J1B8B3			J1B8B4		
		C5			C6			C7			C9			C10			C11			C12		
		6/17/10			6/17/10			6/29/10			6/29/10			6/17/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	80	J	327	327	U	327	315	U	315
Bis(2-chloro-1-methylethyl)ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Bis(2-Chloroethoxy)methane	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Bis(2-chloroethyl) ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Bis(2-ethylhexyl) phthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Butylbenzylphthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Carbazole	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Chrysene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	121	J	327	327	U	327	315	U	315
Di-n-butylphthalate	SVOA	347	U	347	358	U	358	331	UJ	331	320	UJ	320	327	UJ	327	327	UJ	327	315	UJ	315
Di-n-octylphthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Dibenz[a,h]anthracene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Dibenzofuran	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Diethyl phthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Dimethyl phthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Fluoranthene	SVOA	347	U	347	358	U	358	331	U	331	56.9	J	320	198	J	327	327	U	327	86.1	J	315
Fluorene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachlorobutadiene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachlorocyclopentadiene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachloroethane	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Indeno(1,2,3-cd)pyrene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	50.5	J	327	327	U	327	315	U	315
Isophorone	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
N-Nitroso-di-n-dipropylamine	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
N-Nitrosodiphenylamine	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Naphthalene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Nitrobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Pentachlorophenol	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
Phenanthrene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	166	J	327	327	U	327	55.4	J	315
Phenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Pyrene	SVOA	347	U	347	358	U	358	331	U	331	51.4	J	320	245	J	327	327	U	327	71.1	J	315

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C0			J1B8C8			J1B8B6			J1B8B7			J1B8B8			J1B8B9			J1B8C1			J1B8C2			J1B8C3		
		D5			Duplicate of J1B8C0			D1			D2			D3			D4			D6			D7			D8		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	19.4		3.38	3.31	U	3.31	3.58	U	3.58	2.31	J	3.30	9.82		3.38	3.35	U	3.35
Acenaphthylene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Anthracene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Benzo(a)anthracene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	22.6	J	3.38	1.84	J	3.31	3.58	UJ	3.58	2.59	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(a)pyrene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	11.0	J	3.38	3.31	UJ	3.31	3.58	UJ	3.58	3.52	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(b)fluoranthene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	14.3	J	3.38	3.31	UJ	3.31	3.58	UJ	3.58	5.39	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(ghi)perylene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	7.96	J	3.38	3.31	UJ	3.31	1.06	J	3.58	2.97	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(k)fluoranthene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	4.70		3.38	3.31	U	3.31	3.58	U	3.58	1.78	J	3.30	3.38	U	3.38	3.35	U	3.35
Chrysene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	14.2	J	3.38	3.31	UJ	3.31	3.58	UJ	3.58	3.30	UJ	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Dibenz[a,h]anthracene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Fluoranthene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	42.4	J	3.38	2.49	J	3.31	5.19	J	3.58	28.2	J	3.30	2.2	J	3.38	27.3	J	3.35
Fluorene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Indeno(1,2,3-cd)pyrene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	3.38	UJ	3.38	4.76	J	3.31	2.33	J	3.58	2.00	J	3.30	2.01	J	3.38	3.35	UJ	3.35
Naphthalene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Phenanthrene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	25.7		3.38	2.15	J	3.31	0.967	J	3.58	5.45		3.30	1.02	J	3.38	3.35	U	3.35
Pyrene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	5.66	J	3.38	1.69	J	3.31	1.09	J	3.58	6.77	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Aldrin	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Alpha-BHC	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
alpha-Chlordane	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
beta-BHC	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Delta-BHC	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
4,4'-DDD	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
4,4'-DDE	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	2.46	JD	2.46	1.33	UD	1.33	1.43	UD	1.43	1.54	JD	1.54	1.33	UD	1.33	1.34	UD	1.34
4,4'-DDT	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Dieldrin	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endosulfan I	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endosulfan II	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endosulfan sulfate	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endrin	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endrin aldehyde	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endrin ketone	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
gamma-Chlordane	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Heptachlor	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Heptachlor epoxide	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Methoxychlor	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Toxaphene	PEST	19.9	UDJ	19.9	21.4	UDJ	21.4	20.2	UDJ	20.2	19.9	UDJ	19.9	20.0	UDJ	20.0	21.4	UDJ	21.4	20.0	UDJ	20.0	20.0	UDJ	20.0	20.1	UDJ	20.1

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B8C4			J1B8C5			J1B8C6			J1B8C7			J1JCT4			J1JCV1			J1JCR9			J1JCT0		
		D9			D10			D11			D12			E-6			Duplicate of J1JCT4			E-1			E-2		
		6/29/10			6/29/10			6/29/10			6/29/10			5/31/11			5/31/11			5/31/11			5/31/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.44	U	3.44	15.6		3.32	34.0		3.28	2.87	J	3.19	10	U	10	10	U	10	11	U	11	10	U	10
Acenaphthylene	PAH	3.44	U	3.44	21.6		3.32	66.2		3.28	3.19	U	3.19	9.1	U	9.1	9.0	U	9.0	10	U	10	9.0	U	9.0
Anthracene	PAH	3.44	U	3.44	3.32	U	3.32	1.31	J	3.28	3.19	U	3.19	3.1	U	3.1	3.1	U	3.1	3.5	U	3.5	3.1	U	3.1
Benzo(a)anthracene	PAH	6.21	J	3.44	5.09	J	3.32	19.1	J	3.28	2.65	J	3.19	3.2	U	3.2	3.2	U	3.2	3.6	U	3.6	3.2	U	3.2
Benzo(a)pyrene	PAH	7.91	J	3.44	8.22	J	3.32	24.3	J	3.28	1.59	J	3.19	6.5	U	6.5	6.4	U	6.4	7.3	U	7.3	6.4	U	6.4
Benzo(b)fluoranthene	PAH	4.75	J	3.44	9.58	J	3.32	27.9	J	3.28	1.59	J	3.19	4.2	U	4.2	4.2	U	4.2	4.8	U	4.8	4.2	U	4.2
Benzo(ghi)perylene	PAH	4.56	J	3.44	6.44	J	3.32	15.9	J	3.28	1.28	J	3.19	7.3	U	7.3	7.2	U	7.2	8.2	U	8.2	7.2	U	7.2
Benzo(k)fluoranthene	PAH	2.75	J	3.44	3.34		3.32	9.49		3.28	0.925	J	3.19	4.0	U	4.0	3.9	U	3.9	4.5	U	4.5	4.0	U	4.0
Chrysene	PAH	5.4	J	3.44	8.37	J	3.32	17.9	J	3.28	1.13	J	3.19	4.9	U	4.9	4.8	U	4.8	5.5	U	5.5	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	3.44	U	3.44	1.10	J	3.32	2.59	J	3.28	3.19	U	3.19	11	U	11	11	U	11	13	U	13	11	U	11
Fluoranthene	PAH	16	J	3.44	27.6	J	3.32	57.3	J	3.28	3.35	J	3.19	13	U	13	13	U	13	15	U	15	13	U	13
Fluorene	PAH	3.44	U	3.44	1.10	J	3.32	4.27		3.28	3.19	U	3.19	5.3	U	5.3	5.3	U	5.3	6.0	U	6.0	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	4.68	J	3.44	4.19	J	3.32	13.7	J	3.28	1.67	J	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Naphthalene	PAH	3.44	U	3.44	3.32	U	3.32	6.57		3.28	3.19	U	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Phenanthrene	PAH	5.68		3.44	9.15		3.32	19.5		3.28	1.12	J	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Pyrene	PAH	12.6	J	3.44	16.3	J	3.32	58.6	J	3.28	2.95	J	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Aldrin	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.25	U	0.25	0.25	U	0.25	0.29	U	0.29	0.25	U	0.25
Alpha-BHC	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.21	U	0.21	0.22	U	0.22	0.24	U	0.24	0.21	U	0.21
alpha-Chlordane	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.32	U	0.32	0.32	U	0.32	0.37	U	0.37	0.32	U	0.32
beta-BHC	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.67	U	0.67	0.67	U	0.67	0.76	U	0.76	0.65	U	0.65
Delta-BHC	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.40	U	0.40	0.40	U	0.40	0.46	U	0.46	0.39	U	0.39
4,4'-DDD	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.55	U	0.55	0.55	U	0.55	0.62	U	0.62	0.54	U	0.54
4,4'-DDE	PEST	1.36	UD	1.36	2.02	JD	2.02	1.35	UD	1.35	1.34	UD	1.34	0.24	U	0.24	0.24	U	0.24	0.27	U	0.27	0.23	U	0.23
4,4'-DDT	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.59	U	0.59	0.59	U	0.59	0.67	U	0.67	0.58	U	0.58
Dieldrin	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.21	U	0.21	0.21	U	0.21	0.24	U	0.24	0.21	U	0.21
Endosulfan I	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.18	U	0.18	0.18	U	0.18	0.2	U	0.2	0.17	U	0.17
Endosulfan II	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.29	U	0.29	0.29	U	0.29	0.33	U	0.33	0.28	U	0.28
Endosulfan sulfate	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.28	U	0.28	0.28	U	0.28	0.31	U	0.31	0.27	U	0.27
Endrin	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.31	U	0.31	0.31	U	0.31	0.35	U	0.35	0.3	U	0.3
Endrin aldehyde	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.17	U	0.17	0.17	U	0.17	0.19	U	0.19	0.17	U	0.17
Endrin ketone	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.49	U	0.49	0.49	U	0.49	0.56	U	0.56	0.48	U	0.48
Gamma-BHC (Lindane)	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.46	U	0.46	0.47	U	0.47	0.53	U	0.53	0.46	U	0.46
gamma-Chlordane	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.27	U	0.27	0.27	U	0.27	0.3	U	0.3	0.26	U	0.26
Heptachlor	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.21	U	0.21	0.22	U	0.22	0.24	U	0.24	0.21	U	0.21
Heptachlor epoxide	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.43	U	0.43	0.43	U	0.43	0.48	U	0.48	0.42	U	0.42
Methoxychlor	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.45	U	0.45	0.45	U	0.45	0.51	U	0.51	0.44	U	0.44
Toxaphene	PEST	20.4	UDJ	20.4	19.9	UDJ	19.9	20.3	UDJ	20.3	20.1	UDJ	20.1	16	U	16	16	U	16	18	U	18	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCT1			J1JCT2			J1JCT3			J1JCT5			J1JCT6			J1JCT7			J1JCT8			J1JCT9		
		E-3			E-4			E-5			E-7			E-8			E-9			E-10			E-11		
		5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	10	U	10	10	U	10	9.8	U	9.8	9.8	U	9.8	10	U	10	10	U	10
Acenaphthylene	PAH	9.0	U	9.0	9.0	U	9.0	9.1	U	9.1	9.0	U	9.0	8.8	U	8.8	8.9	U	8.9	9.2	U	9.2	9.2	U	9.2
Anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.1	U	3.1	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1	12	J	3.3	3.2	U	3.2
Benzo(a)pyrene	PAH	6.4	U	6.4	6.4	U	6.4	6.5	U	6.5	6.4	U	6.4	6.3	U	6.3	6.3	U	6.3	6.6	U	6.6	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.1	U	4.1	13	J	4.3	4.3	U	4.3
Benzo(ghi)perylene	PAH	7.2	U	7.2	7.2	U	7.2	7.2	U	7.2	7.2	U	7.2	7.0	U	7.0	7.1	U	7.1	7.4	U	7.4	7.3	U	7.3
Benzo(k)fluoranthene	PAH	3.9	U	3.9	4.0	U	4.0	4.0	U	4.0	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	4.0	U	4.0	4.0	U	4.0
Chrysene	PAH	4.9	U	4.9	4.9	U	4.9	4.9	U	4.9	4.8	U	4.8	4.7	U	4.7	4.8	U	4.8	15	J	4.9	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	23	J	13	13	U	13
Fluorene	PAH	5.3	U	5.3	5.3	U	5.3	5.3	U	5.3	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.4	U	5.4	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	30	J	12	12	U	12
Aldrin	PEST	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.24	U	0.24	0.25	U	0.25	0.25	U	0.25	0.26	U	0.26
Alpha-BHC	PEST	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
alpha-Chlordane	PEST	0.33	U	0.33	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32	0.31	U	0.31	0.32	U	0.32	0.33	U	0.33	0.33	U	0.33
beta-BHC	PEST	0.67	U	0.67	0.67	U	0.67	0.65	U	0.65	0.67	U	0.67	0.64	U	0.64	0.66	U	0.66	0.67	U	0.67	0.68	U	0.68
Delta-BHC	PEST	0.41	U	0.41	0.40	U	0.40	0.39	U	0.39	0.4	U	0.4	0.38	U	0.38	0.40	U	0.40	0.41	U	0.41	0.41	U	0.41
4,4'-DDD	PEST	0.55	U	0.55	0.55	U	0.55	0.54	U	0.54	0.55	U	0.55	0.52	U	0.52	0.54	U	0.54	0.55	U	0.55	0.56	U	0.56
4,4'-DDE	PEST	0.24	U	0.24	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24
4,4'-DDT	PEST	0.6	U	0.6	0.59	U	0.59	0.58	U	0.58	0.59	U	0.59	0.57	U	0.57	0.59	U	0.59	0.6	U	0.6	0.61	U	0.61
Dieldrin	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22
Endosulfan I	PEST	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18
Endosulfan II	PEST	0.29	U	0.29	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29	0.29	U	0.29	0.29	U	0.29
Endosulfan sulfate	PEST	0.28	U	0.28	0.28	U	0.28	0.27	U	0.27	0.28	U	0.28	0.26	U	0.26	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28
Endrin	PEST	0.31	U	0.31	0.31	U	0.31	0.30	U	0.30	0.31	U	0.31	0.29	U	0.29	0.3	U	0.3	0.31	U	0.31	0.31	U	0.31
Endrin aldehyde	PEST	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.16	U	0.16	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endrin ketone	PEST	0.5	U	0.5	0.49	U	0.49	0.48	U	0.48	0.49	U	0.49	0.47	U	0.47	0.49	U	0.49	0.50	U	0.50	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.47	U	0.47	0.47	U	0.47	0.45	U	0.45	0.47	U	0.47	0.45	U	0.45	0.46	U	0.46	0.47	U	0.47	0.48	U	0.48
gamma-Chlordane	PEST	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27
Heptachlor	PEST	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
Heptachlor epoxide	PEST	0.43	U	0.43	0.43	U	0.43	0.42	U	0.42	0.43	U	0.43	0.41	U	0.41	0.42	U	0.42	0.43	U	0.43	0.44	U	0.44
Methoxychlor	PEST	0.46	U	0.46	0.45	U	0.45	0.44	U	0.44	0.45	U	0.45	0.43	U	0.43	0.45	U	0.45	0.46	U	0.46	0.46	U	0.46
Toxaphene	PEST	16	U	16	16	U	16	15	U	15	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV0			J1JCV3			J1JCW4			J1JCV2			J1JCV4			J1JCV5			J1JCV6			J1JCV7		
		E-12			F-2			Duplicate of J1JCV3			F-1			F-3			F-4			F-5			F-6		
		5/31/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.7	U	9.7	10	U	10	10	U	10	9.9	U	9.9	9.9	U	9.9	9.9	U	9.9	9.8	U	9.8	10	U	10
Acenaphthylene	PAH	8.7	U	8.7	9.4	U	9.4	9.1	U	9.1	8.9	U	8.9	8.9	U	8.9	8.9	U	8.9	8.8	U	8.8	9.4	U	9.4
Anthracene	PAH	3.0	U	3.0	3.2	U	3.2	3.1	U	3.1	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.2	U	3.2
Benzo(a)anthracene	PAH	3.1	U	3.1	3.3	U	3.3	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.3	U	3.3
Benzo(a)pyrene	PAH	6.2	U	6.2	6.7	U	6.7	6.5	U	6.5	6.4	U	6.4	6.4	U	6.4	6.3	U	6.3	6.3	U	6.3	6.7	U	6.7
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.4	U	4.4	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.4	U	4.4
Benzo(ghi)perylene	PAH	7.0	U	7.0	7.5	U	7.5	7.2	U	7.2	7.1	U	7.1	7.2	U	7.2	7.1	U	7.1	7.1	U	7.1	7.5	U	7.5
Benzo(k)fluoranthene	PAH	3.8	U	3.8	4.1	U	4.1	4.0	U	4.0	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	4.1	U	4.1
Chrysene	PAH	4.7	U	4.7	5.1	U	5.1	4.9	U	4.9	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	5.1	U	5.1
Dibenz[a,h]anthracene	PAH	11	U	11	12	U	12	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	12	U	12
Fluoranthene	PAH	13	U	13	14	U	14	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14
Fluorene	PAH	5.1	U	5.1	5.5	U	5.5	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2	5.5	U	5.5
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Naphthalene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Phenanthrene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Pyrene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Aldrin	PEST	0.25	U	0.25	0.24	U	0.24	0.25	U	0.25	0.26	U	0.26	0.26	U	0.26	0.25	U	0.25	0.24	U	0.24	0.26	U	0.26
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22
alpha-Chlordane	PEST	0.32	U	0.32	0.31	U	0.31	0.32	U	0.32	0.33	U	0.33	0.33	U	0.33	0.32	U	0.32	0.32	U	0.32	0.33	U	0.33
beta-BHC	PEST	0.66	U	0.66	0.65	U	0.65	0.65	U	0.65	0.68	U	0.68	0.68	U	0.68	0.66	U	0.66	0.65	U	0.65	0.68	U	0.68
Delta-BHC	PEST	0.4	U	0.40	0.39	U	0.39	0.39	U	0.39	0.41	U	0.41	0.41	U	0.41	0.40	U	0.40	0.39	U	0.39	0.41	U	0.41
4,4'-DDD	PEST	0.54	U	0.54	0.53	U	0.53	0.54	U	0.54	0.56	U	0.56	0.56	U	0.56	0.54	U	0.54	0.53	U	0.53	0.56	U	0.56
4,4'-DDE	PEST	0.24	U	0.24	0.23	U	0.23	0.23	U	0.23	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24
4,4'-DDT	PEST	0.59	U	0.59	0.58	U	0.58	0.58	U	0.58	0.61	U	0.61	0.61	U	0.61	0.59	U	0.59	0.58	U	0.58	0.61	U	0.61
Dieldrin	PEST	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21	0.20	U	0.20	0.22	U	0.22
Endosulfan I	PEST	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18
Endosulfan II	PEST	0.29	U	0.29	0.28	U	0.28	0.28	U	0.28	0.29	U	0.29	0.29	U	0.29	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29
Endosulfan sulfate	PEST	0.27	U	0.27	0.27	U	0.27	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28	0.27	U	0.27	0.27	U	0.27	0.28	UN	0.28
Endrin	PEST	0.3	U	0.30	0.3	U	0.3	0.3	U	0.3	0.31	U	0.31	0.31	U	0.31	0.30	U	0.30	0.30	U	0.30	0.31	U	0.31
Endrin aldehyde	PEST	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endrin ketone	PEST	0.49	U	0.49	0.48	U	0.48	0.48	U	0.48	0.50	U	0.50	0.50	U	0.50	0.49	U	0.49	0.48	U	0.48	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.46	U	0.46	0.45	U	0.45	0.46	U	0.46	0.48	U	0.48	0.48	U	0.48	0.46	U	0.46	0.45	U	0.45	0.48	U	0.48
gamma-Chlordane	PEST	0.26	U	0.26	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22
Heptachlor epoxide	PEST	0.42	U	0.42	0.42	U	0.42	0.42	U	0.42	0.44	U	0.44	0.44	U	0.44	0.42	U	0.42	0.42	U	0.42	0.44	U	0.44
Methoxychlor	PEST	0.45	U	0.45	0.44	U	0.44	0.44	U	0.44	0.46	U	0.46	0.46	U	0.46	0.45	U	0.45	0.44	U	0.44	0.46	UN	0.46
Toxaphene	PEST	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16

Attachment 1	Sheet No. 31 of 45
Originator T. E. Queen	Date 7/13/11
Checked J. D. Skoglie	Date 7/13/11
Calc. No. 0100H-CA-V0178	Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV8			J1JCV9			J1JCW0			J1JCW1			J1JCW2			J1JCW3		
		F-7			F-8			F-9			F-10			F-11			F-12		
		5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.7	U	9.7	10	U	10	9.7	U	9.7	9.6	U	9.6	10	U	10	10	U	10
Acenaphthylene	PAH	8.7	U	8.7	9.0	U	9.0	8.8	U	8.8	8.6	U	8.6	9.1	U	9.1	9.0	U	9.0
Anthracene	PAH	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	2.9	U	2.9	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.1	U	3.1	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2	3.2	U	3.2
Benzo(a)pyrene	PAH	6.2	U	6.2	6.4	U	6.4	6.2	U	6.2	6.1	U	6.1	6.5	U	6.5	6.4	U	6.4
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.2	U	4.2	4.1	U	4.1	4.0	U	4.0	4.3	U	4.3	4.2	U	4.2
Benzo(ghi)perylene	PAH	7.0	U	7.0	7.2	U	7.2	7.0	U	7.0	6.9	U	6.9	7.3	U	7.3	7.2	U	7.2
Benzo(k)fluoranthene	PAH	3.8	U	3.8	3.9	U	3.9	3.8	U	3.8	3.8	U	3.8	4.0	U	4.0	4.0	U	4.0
Chrysene	PAH	4.7	U	4.7	4.8	U	4.8	4.7	U	4.7	4.6	U	4.6	4.9	U	4.9	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13	13	U	13
Fluorene	PAH	5.1	U	5.1	5.3	U	5.3	5.1	U	5.1	5.1	U	5.1	5.4	U	5.4	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Aldrin	PEST	0.24	U	0.24	0.25	U	0.25	0.24	U	0.24	0.24	U	0.24	0.25	U	0.25	0.26	U	0.26
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20	0.20	U	0.20	0.21	U	0.21	0.22	U	0.22
alpha-Chlordane	PEST	0.31	U	0.31	0.32	U	0.32	0.31	U	0.31	0.30	U	0.30	0.32	U	0.32	0.33	U	0.33
beta-BHC	PEST	0.64	U	0.64	0.66	U	0.66	0.63	U	0.63	0.63	U	0.63	0.65	U	0.65	0.68	U	0.68
Delta-BHC	PEST	0.39	U	0.39	0.40	U	0.40	0.38	U	0.38	0.38	U	0.38	0.39	U	0.39	0.41	U	0.41
4,4'-DDD	PEST	0.53	U	0.53	0.54	U	0.54	0.52	U	0.52	0.51	U	0.51	0.53	U	0.53	0.56	U	0.56
4,4'-DDE	PEST	0.23	U	0.23	0.24	U	0.24	0.22	U	0.22	0.22	U	0.22	0.23	U	0.23	0.24	U	0.24
4,4'-DDT	PEST	0.57	U	0.57	0.59	U	0.59	0.56	U	0.56	0.56	U	0.56	0.58	U	0.58	0.60	U	0.60
Dieldrin	PEST	0.20	U	0.20	0.21	U	0.21	0.20	U	0.20	0.20	U	0.20	0.21	U	0.21	0.21	U	0.21
Endosulfan I	PEST	0.17	U	0.17	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endosulfan II	PEST	0.28	U	0.28	0.29	U	0.29	0.27	U	0.27	0.27	U	0.27	0.28	U	0.28	0.29	U	0.29
Endosulfan sulfate	PEST	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.28	U	0.28
Endrin	PEST	0.29	U	0.29	0.30	U	0.30	0.29	U	0.29	0.29	U	0.29	0.30	U	0.30	0.31	U	0.31
Endrin aldehyde	PEST	0.16	U	0.16	0.17	U	0.17	0.16	U	0.16	0.16	U	0.16	0.17	U	0.17	0.17	U	0.17
Endrin ketone	PEST	0.47	U	0.47	0.49	U	0.49	0.46	U	0.46	0.46	U	0.46	0.48	U	0.48	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.45	U	0.45	0.46	U	0.46	0.44	U	0.44	0.44	U	0.44	0.45	U	0.45	0.47	U	0.47
gamma-Chlordane	PEST	0.26	U	0.26	0.26	U	0.26	0.25	U	0.25	0.25	U	0.25	0.26	U	0.26	0.27	U	0.27
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20	0.20	U	0.20	0.21	U	0.21	0.22	U	0.22
Heptachlor epoxide	PEST	0.41	U	0.41	0.42	U	0.42	0.40	U	0.40	0.40	U	0.40	0.42	U	0.42	0.43	U	0.43
Methoxychlor	PEST	0.43	U	0.43	0.45	U	0.45	0.43	U	0.43	0.42	U	0.42	0.44	U	0.44	0.46	U	0.46
Toxaphene	PEST	15	U	15	16	U	16	15	U	15	15	U	15	15	U	15	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B8C0			J1B8C8			J1B8B6			J1B8B7			J1B8B8			J1B8B9			J1B8C1			J1B8C2			J1B8C3		
		D5			Duplicate of J1B8B9			D1			D2			D3			D4			D6			D7			D8		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1221	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1232	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1242	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1248	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1254	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	9.43	J	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1260	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	19.2		13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
1,2,4-Trichlorobenzene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
1,2-Dichlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
1,3-Dichlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
1,4-Dichlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4,5-Trichlorophenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4,6-Trichlorophenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4-Dichlorophenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4-Dimethylphenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4-Dinitrophenol	SVOA	1670	UJ	1670	1730	U	1730	1620	UJ	1620	1700	UJ	1700	1650	UJ	1650	1740	UJ	1740	1660	UJ	1660	1660	UJ	1660	1660	UJ	1660
2,4-Dinitrotoluene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,6-Dinitrotoluene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Chloronaphthalene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Chlorophenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Methylnaphthalene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Methylphenol (cresol, o-)	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Nitroaniline	SVOA	1670	U	1670	1730	UJ	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
2-Nitrophenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
3+4 Methylphenol (cresol, m+p)	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
3,3'-Dichlorobenzidine	SVOA	669	U	669	692	UJ	692	648	U	648	679	U	679	661	U	661	697	U	697	664	U	664	666	U	666	665	U	665
3-Nitroaniline	SVOA	1670	U	1670	1730	U	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
4,6-Dinitro-2-methylphenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Bromophenylphenyl ether	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Chloro-3-methylphenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Chloroaniline	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Chlorophenylphenyl ether	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Nitroaniline	SVOA	1670	U	1670	1730	UJ	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
4-Nitrophenol	SVOA	1670	U	1670	1730	UJ	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
Acenaphthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Acenaphthylene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Anthracene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(a)anthracene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(a)pyrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(b)fluoranthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(ghi)perylene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C4			J1B8C5			J1B8C6			J1B8C7			J1JCT4			J1JCV1			J1JCR9			J1JCT0		
		D9			D10			D11			D12			E-6			Duplicate of J1JCT4			E-1			E-2		
		6/29/10			6/29/10			6/29/10			6/29/10			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2.8	U	2.8	2.8	U	2.8	3.1	U	3.1	2.8	U	2.8
Aroclor-1221	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	8.1	U	8.1	8.1	U	8.1	9.1	U	9.1	8	U	8
Aroclor-1232	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2	U	2	2	U	2	2.3	U	2.3	2	U	2
Aroclor-1242	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	4.7	U	4.7	4.7	U	4.7	5.3	U	5.3	4.7	U	4.7
Aroclor-1248	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	4.7	U	4.7	4.7	U	4.7	5.3	U	5.3	4.7	U	4.7
Aroclor-1254	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2.6	U	2.6	2.6	U	2.6	2.9	U	2.9	2.6	U	2.6
Aroclor-1260	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2.6	U	2.6	2.6	U	2.6	2.9	U	2.9	2.6	U	2.6
1,2,4-Trichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	29	U	29	27	U	27	31	U	31	27	U	27
1,2-Dichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	24	U	24	21	U	21
1,3-Dichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	12	U	12	12	U	12	13	U	13	12	U	12
1,4-Dichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	14	U	14	13	U	13	15	U	15	13	U	13
2,4,5-Trichlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2,4-Dichlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2,4-Dimethylphenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	67	U	67	64	U	64	72	U	72	64	U	64
2,4-Dinitrophenol	SVOA	1720	UJ	1720	1640	UJ	1640	1630	UJ	1630	1640	U	1640	340	U	340	320	U	320	370	U	370	320	U	320
2,4-Dinitrotoluene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	67	U	67	64	U	64	72	U	72	64	U	64
2,6-Dinitrotoluene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	29	U	29	27	U	27	31	U	31	27	U	27
2-Chloronaphthalene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2-Chlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	21	U	21	20	U	20	23	U	23	20	U	20
2-Methylnaphthalene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	19	U	19	18	U	18	21	U	21	19	U	19
2-Methylphenol (cresol, o-)	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	13	U	13	13	U	13	14	U	14	13	U	13
2-Nitroaniline	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	UJ	1640	51	U	51	48	U	48	55	U	55	49	U	49
2-Nitrophenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
3+4 Methylphenol (cresol, m+p)	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	92	U	92	87	U	87	99	U	99	88	U	88
3,3'-Dichlorobenzidine	SVOA	687	U	687	655	U	655	651	U	651	654	UJ	654	34	U	34	32	U	32	36	U	36	32	U	32
3-Nitroaniline	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	U	1640	74	U	74	71	U	71	80	U	80	71	U	71
4,6-Dinitro-2-methylphenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	340	U	340	320	U	320	360	U	360	320	U	320
4-Bromophenylphenyl ether	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	19	U	19	18	U	18	21	U	21	19	U	19
4-Chloro-3-methylphenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	67	U	67	64	U	64	72	U	72	64	U	64
4-Chloroaniline	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	83	U	83	79	U	79	90	U	90	80	U	80
4-Chlorophenylphenyl ether	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	21	U	21	20	U	20	23	U	23	20	U	20
4-Nitroaniline	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	UJ	1640	74	U	74	70	U	70	80	U	80	71	U	71
4-Nitrophenol	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	UJ	1640	99	U	99	94	U	94	110	U	110	95	U	95
Acenaphthene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	10	U	10	10	U	10	11	U	11	10	U	10
Acenaphthylene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
Anthracene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
Benzo(a)anthracene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	20	U	20	19	U	19	22	U	22	20	U	20
Benzo(a)pyrene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	20	U	20	19	U	19	22	U	22	20	U	20
Benzo(b)fluoranthene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	27	U	27	25	U	25	29	U	29	26	U	26
Benzo(ghi)perylene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	16	U	16	16	U	16	18	U	18	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCT1			J1JCT2			J1JCT3			J1JCT5			J1JCT6			J1JCT7			J1JCT8			J1JCT9		
		E-3			E-4			E-5			E-7			E-8			E-9			E-10			E-11		
		5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8.1	U	8.1	8	U	8	7.7	U	7.7	7.9	U	7.9	7.8	U	7.8	8.1	U	8.1	8.2	U	8.2	8.2	U	8.2
Aroclor-1232	PCB	2	U	2	2	U	2	1.9	U	1.9	2	U	2	1.9	U	1.9	2	U	2	2.1	U	2.1	2	U	2
Aroclor-1242	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	4.6	U	4.6	4.5	U	4.5	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8
Aroclor-1248	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	4.6	U	4.6	4.5	U	4.5	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
1,2,4-Trichlorobenzene	SVOA	27	U	27	28	U	28	27	U	27	28	U	28	27	U	27	27	U	27	28	U	28	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	21	U	21	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	14	U	14	13	U	13	13	U	13	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2,4-Dichlorophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2,4-Dimethylphenol	SVOA	64	U	64	66	U	66	63	U	63	66	U	66	64	U	64	65	U	65	67	U	67	67	U	67
2,4-Dinitrophenol	SVOA	330	U	330	330	U	330	320	U	320	330	U	330	320	U	320	330	U	330	340	U	340	340	U	340
2,4-Dinitrotoluene	SVOA	64	U	64	66	U	66	63	U	63	66	U	66	64	U	64	65	U	65	67	U	67	67	U	67
2,6-Dinitrotoluene	SVOA	27	U	27	28	U	28	27	U	27	28	U	28	27	U	27	27	U	27	28	U	28	28	U	28
2-Chloronaphthalene	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	50	U	50	48	U	48	50	U	50	49	U	49	49	U	49	50	U	50	51	U	51
2-Nitrophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	88	U	88	90	U	90	87	U	87	90	U	90	88	U	88	88	U	88	91	U	91	91	U	91
3,3'-Dichlorobenzidine	SVOA	32	U	32	33	U	33	32	U	32	33	U	33	32	U	32	32	U	32	33	U	33	33	U	33
3-Nitroaniline	SVOA	71	U	71	73	U	73	70	U	70	73	U	73	71	U	71	72	U	72	74	U	74	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	330	U	330	320	U	320	330	U	330	320	U	320	320	U	320	330	U	330	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	66	U	66	63	U	63	66	U	66	64	U	64	65	U	65	67	U	67	67	U	67
4-Chloroaniline	SVOA	80	U	80	82	U	82	79	U	79	82	U	82	80	U	80	80	U	80	83	U	83	83	U	83
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
4-Nitroaniline	SVOA	71	U	71	73	U	73	70	U	70	72	U	72	71	U	71	71	U	71	73	U	73	73	U	73
4-Nitrophenol	SVOA	95	U	95	97	U	97	93	U	93	97	U	97	95	U	95	95	U	95	98	U	98	98	U	98
Acenaphthene	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	20	U	20	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	19	U	19	20	U	20	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	25	U	25	26	U	26	26	U	26	26	U	26	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV0			J1JCV3			J1JCW4			J1JCV2			J1JCV4			J1JCV5			J1JCV6			J1JCV7		
		E-12			F-2			Duplicate of J1JCV3			F-1			F-3			F-4			F-5			F-6		
		5/31/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.9	U	2.9	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8	U	8	8	U	8	8.1	U	8.1	8.2	U	8.2	8.3	U	8.3	8.2	U	8.2	8.2	U	8.2	8	U	8
Aroclor-1232	PCB	2	U	2	2	U	2	2	U	2	2	U	2	2.1	U	2.1	2	U	2	2.1	U	2.1	2	U	2
Aroclor-1242	PCB	4.6	U	4.6	4.6	U	4.6	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6
Aroclor-1248	PCB	4.6	U	4.6	4.6	U	4.6	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
1,2,4-Trichlorobenzene	SVOA	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	30	U	30	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2,4-Dimethylphenol	SVOA	65	U	65	68	U	68	66	U	66	66	U	66	69	U	69	70	U	70	65	U	65	67	U	67
2,4-Dinitrophenol	SVOA	330	U	330	340	U	340	340	U	340	330	U	330	350	U	350	350	U	350	330	U	330	340	U	340
2,4-Dinitrotoluene	SVOA	65	U	65	68	U	68	66	U	66	66	U	66	69	U	69	70	U	70	65	U	65	67	U	67
2,6-Dinitrotoluene	SVOA	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	30	U	30	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2-Chlorophenol	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14	14	U	14	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	52	U	52	50	U	50	50	U	50	52	U	52	53	U	53	49	U	49	50	U	50
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	89	U	89	93	U	93	91	U	91	90	U	90	94	U	94	95	U	95	88	U	88	91	U	91
3,3'-Dichlorobenzidine	SVOA	33	U	33	34	U	34	33	U	33	33	U	33	34	U	34	35	U	35	32	U	32	33	U	33
3-Nitroaniline	SVOA	72	U	72	75	U	75	73	U	73	73	U	73	76	U	76	77	U	77	71	U	71	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	340	U	340	330	U	330	330	U	330	340	U	340	350	U	350	320	U	320	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	68	U	68	66	U	66	66	U	66	69	U	69	70	U	70	65	U	65	67	U	67
4-Chloroaniline	SVOA	81	U	81	85	U	85	82	U	82	82	U	82	85	U	85	87	U	87	80	U	80	83	U	83
4-Chlorophenylphenyl ether	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
4-Nitroaniline	SVOA	72	U	72	75	U	75	73	U	73	73	U	73	75	U	75	77	U	77	71	U	71	73	U	73
4-Nitrophenol	SVOA	96	U	96	100	U	100	98	U	98	97	U	97	100	U	100	100	U	100	95	U	95	98	U	98
Acenaphthene	SVOA	10	U	10	11	U	11	10	U	10	10	U	10	11	U	11	11	U	11	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	27	U	27	26	U	26	26	U	26	27	U	27	28	U	28	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17	16	U	16	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCV8			J1JCV9			J1JCW0			J1JCW1			J1JCW2			J1JCW3		
		F-7			F-8			F-9			F-10			F-11			F-12		
		5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8	2.6	U	2.6	2.8	U	2.8
Aroclor-1221	PCB	8.2	U	8.2	8.2	U	8.2	7.9	U	7.9	8.2	U	8.2	7.6	U	7.6	8.2	U	8.2
Aroclor-1232	PCB	2	U	2	2	U	2	2	U	2	2	U	2	1.9	U	1.9	2	U	2
Aroclor-1242	PCB	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6	4.8	U	4.8	4.4	U	4.4	4.8	U	4.8
Aroclor-1248	PCB	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6	4.8	U	4.8	4.4	U	4.4	4.8	U	4.8
Aroclor-1254	PCB	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7	2.5	U	2.5	2.7	U	2.7
Aroclor-1260	PCB	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7	2.5	U	2.5	2.7	U	2.7
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	14	U	14	13	U	13	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2,4-Dichlorophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2,4-Dimethylphenol	SVOA	65	U	65	65	U	65	66	U	66	64	U	64	63	U	63	66	U	66
2,4-Dinitrophenol	SVOA	330	U	330	330	U	330	330	U	330	320	U	320	320	U	320	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65	65	U	65	66	U	66	64	U	64	63	U	63	66	U	66
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2-Chlorophenol	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13
2-Nitroaniline	SVOA	49	U	49	49	U	49	50	U	50	48	U	48	48	U	48	50	U	50
2-Nitrophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
3+4 Methylphenol (cresol, m+p)	SVOA	88	U	88	89	U	89	90	U	90	87	U	87	86	U	86	90	U	90
3,3'-Dichlorobenzidine	SVOA	32	U	32	32	U	32	33	U	33	32	U	32	31	U	31	33	U	33
3-Nitroaniline	SVOA	72	U	72	72	U	72	73	U	73	71	U	71	69	U	69	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	330	U	330	320	U	320	310	U	310	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	65	U	65	66	U	66	64	U	64	63	U	63	66	U	66
4-Chloroaniline	SVOA	81	U	81	81	U	81	82	U	82	79	U	79	78	U	78	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
4-Nitroaniline	SVOA	71	U	71	71	U	71	72	U	72	70	U	70	69	U	69	72	U	72
4-Nitrophenol	SVOA	95	U	95	95	U	95	97	U	97	94	U	94	92	U	92	96	U	96
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	20	U	20	19	U	19	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	20	U	20	19	U	19	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	26	U	26	25	U	25	25	U	25	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B8C0			J1B8C8			J1B8B6			J1B8B7			J1B8B8			J1B8B9			J1B8C1			J1B8C2			J1B8C3		
		D5			Duplicate of J1B8B9			D1			D2			D3			D4			D6			D7			D8		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-chloro-1-methylethyl)ether	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-Chloroethoxy)methane	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-chloroethyl) ether	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-ethylhexyl) phthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Butylbenzylphthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Carbazole	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Chrysene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Di-n-butylphthalate	SVOA	334	UJ	334	346	UJ	346	324	UJ	324	339	UJ	339	330	UJ	330	349	UJ	349	332	UJ	332	333	UJ	333	332	UJ	332
Di-n-octylphthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Dibenz[a,h]anthracene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Dibenzofuran	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Diethyl phthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Dimethyl phthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Fluoranthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Fluorene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachlorobutadiene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachlorocyclopentadiene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachloroethane	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Indeno(1,2,3-cd)pyrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Isophorone	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
N-Nitroso-di-n-dipropylamine	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
N-Nitrosodiphenylamine	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Naphthalene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Nitrobenzene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Pentachlorophenol	SVOA	1670	U	1670	1730	U	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
Phenanthrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Phenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Pyrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B8C4			J1B8C5			J1B8C6			J1B8C7			J1JCT4			J1JCV1			J1JCR9			J1JCT0		
		D9			D10			D11			D12			E-6			Duplicate of J1JCT4			E-1			E-2		
		6/29/10			6/29/10			6/29/10			6/29/10			5/31/11			5/31/11			5/31/11			5/31/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	41	U	41	39	U	39	44	U	44	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	23	U	23	22	U	22	25	U	25	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	23	U	23	22	U	22	25	U	25	22	U	22
Bis(2-chloroethyl) ether	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	18	U	18	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	76	JB	47	66	JB	45	51	U	51	45	U	45
Butylbenzylphthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	44	U	44	42	U	42	47	U	47	42	U	42
Carbazole	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	37	U	37	35	U	35	40	U	40	35	U	35
Chrysene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	27	U	27	26	U	26	30	U	30	26	U	26
Di-n-butylphthalate	SVOA	343	UJ	343	327	UJ	327	325	UJ	325	327	UJ	327	19	U	19	18	U	18	21	U	21	19	U	19
Di-n-octylphthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	20	U	20	19	U	19	22	U	22	20	U	20
Dibenz[a,h]anthracene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	26	U	26	25	U	25	29	U	29	25	U	25
Dibenzofuran	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	23	U	23	22	U	22	25	U	25	22	U	22
Diethyl phthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	30	U	30	28	U	28	32	U	32	28	U	28
Dimethyl phthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	15	U	15	14	U	14	16	U	16	14	U	14
Fluoranthene	SVOA	343	U	343	93.6	J	327	325	U	325	327	UJ	327	37	U	37	35	U	35	40	U	40	35	U	35
Fluorene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	18	U	18	17	U	17	20	U	20	18	U	18
Hexachlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	30	U	30	28	U	28	32	U	32	28	U	28
Hexachlorobutadiene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	51	U	51	48	U	48	55	U	55	49	U	49
Hexachloroethane	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	23	U	23	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	24	U	24	21	U	21
Isophorone	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	32	U	32	30	U	30	34	U	34	30	U	30
N-Nitrosodiphenylamine	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	24	U	24	21	U	21
Naphthalene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	32	U	32	30	U	30	34	U	34	30	U	30
Nitrobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	21	U	21	20	U	20	23	U	23	20	U	20
Pentachlorophenol	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	U	1640	340	U	340	320	U	320	360	U	360	320	U	320
Phenanthrene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
Phenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	18	U	18	17	U	17	20	U	20	18	U	18
Pyrene	SVOA	343	U	343	99.5	J	327	325	U	325	327	UJ	327	12	U	12	12	U	12	13	U	13	12	U	12

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCT1			J1JCT2			J1JCT3			J1JCT5			J1JCT6			J1JCT7			J1JCT8			J1JCT9		
		E-3			E-4			E-5			E-7			E-8			E-9			E-10			E-11		
		5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	**CLASS**	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	39	U	39	40	U	40	38	U	38	40	U	40	39	U	39	39	U	39	40	U	40	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	22	U	22	23	U	23	22	U	22	23	U	23	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	22	U	22	23	U	23	22	U	22	23	U	23	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	16	U	16	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	76	JB	45	74	JB	46	70	JB	44	77	JB	46	74	JB	45	75	JB	45	69	JB	46	74	JB	46
Butylbenzylphthalate	SVOA	42	U	42	43	U	43	41	U	41	43	U	43	42	U	42	42	U	42	43	U	43	43	U	43
Carbazole	SVOA	35	U	35	36	U	36	35	U	35	36	U	36	35	U	35	35	U	35	36	U	36	36	U	36
Chrysene	SVOA	26	U	26	27	U	27	26	U	26	27	U	27	26	U	26	27	U	27	27	U	27	27	U	27
Di-n-butylphthalate	SVOA	19	U	19	19	U	19	18	U	18	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
Di-n-octylphthalate	SVOA	20	U	20	20	U	20	19	U	19	20	U	20	19	U	19	20	U	20	20	U	20	20	U	20
Dibenz[a,h]anthracene	SVOA	25	U	25	26	U	26	25	U	25	26	U	26	25	U	25	26	U	26	26	U	26	26	U	26
Dibenzofuran	SVOA	22	U	22	23	U	23	22	U	22	23	U	23	22	U	22	23	U	23	23	U	23	23	U	23
Diethyl phthalate	SVOA	28	U	28	29	U	29	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	29	U	29
Dimethyl phthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15
Fluoranthene	SVOA	35	U	35	36	U	36	35	U	35	36	U	36	35	U	35	35	U	35	36	U	36	36	U	36
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	28	U	28	29	U	29	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	29	U	29
Hexachlorobutadiene	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	50	U	50	48	U	48	50	U	50	49	U	49	49	U	49	50	U	50	51	U	51
Hexachloroethane	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	21	U	21	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	31	U	31	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	22	U	22	21	U	21	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Naphthalene	SVOA	30	U	30	31	U	31	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31	31	U	31
Nitrobenzene	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
Pentachlorophenol	SVOA	320	U	320	330	U	330	320	U	320	330	U	330	320	U	320	320	U	320	330	U	330	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Phenol	SVOA	18	U	18	18	U	18	17	U	17	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	16	J	12	12	U	12

Attachment	1	Sheet No.	40 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCV0			J1JCV3			J1JCW4			J1JCV2			J1JCV4			J1JCV5			J1JCV6			J1JCV7		
		E-12			F-2			Duplicate of J1JCV3			F-1			F-3			F-4			F-5			F-6		
		5/31/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	40	U	40	41	U	41	40	U	40	40	U	40	42	U	42	42	U	42	39	U	39	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	72	JB	45	47	U	47	76	JB	46	46	U	46	77	JB	48	74	JB	49	71	JB	45	73	JB	46
Butylbenzylphthalate	SVOA	42	U	42	44	U	44	43	U	43	43	U	43	45	U	45	45	U	45	42	U	42	43	U	43
Carbazole	SVOA	36	U	36	37	U	37	36	U	36	36	U	36	37	U	37	38	U	38	35	U	35	36	U	36
Chrysene	SVOA	27	U	27	28	U	28	27	U	27	27	U	27	28	U	28	29	U	29	26	U	26	27	U	27
Di-n-butylphthalate	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19	19	U	19
Di-n-octylphthalate	SVOA	20	U	20	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20	20	U	20
Dibenz[a,h]anthracene	SVOA	26	U	26	35	JB	27	26	U	26	31	JB	26	27	U	27	29	JB	27	25	U	25	26	U	26
Dibenzofuran	SVOA	23	U	23	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24	23	U	23	23	U	23
Diethyl phthalate	SVOA	29	U	29	30	U	30	29	U	29	29	U	29	30	U	30	31	U	31	28	U	28	29	U	29
Dimethyl phthalate	SVOA	14	U	14	15	U	15	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	15	U	15
Fluoranthene	SVOA	36	U	36	37	U	37	36	U	36	36	U	36	37	U	37	38	U	38	35	U	35	36	U	36
Fluorene	SVOA	18	U	18	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18	18	U	18
Hexachlorobenzene	SVOA	29	U	29	30	U	30	29	U	29	29	U	29	30	U	30	31	U	31	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	52	U	52	50	U	50	50	U	50	52	U	52	53	U	53	49	U	49	50	U	50
Hexachloroethane	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	23	U	23	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	32	U	32	31	U	31	31	U	31	32	U	32	33	U	33	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	22	U	22	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Naphthalene	SVOA	31	U	31	32	U	32	31	U	31	31	U	31	32	U	32	33	U	33	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
Pentachlorophenol	SVOA	330	U	330	340	U	340	330	U	330	330	U	330	340	U	340	350	U	350	320	U	320	330	U	330
Phenanthrene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
Phenol	SVOA	18	U	18	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13	13	U	13	12	U	12	12	U	12

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV8			J1JCV9			J1JCW0			J1JCW1			J1JCW2			J1JCW3		
		F-7			F-8			F-9			F-10			F-11			F-12		
		5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	40	U	40	39	U	39	38	U	38	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	17	U	17	16	U	16	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	66	JB	45	45	U	45	46	U	46	45	U	45	44	U	44	46	U	46
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	43	U	43	42	U	42	41	U	41	43	U	43
Carbazole	SVOA	35	U	35	35	U	35	36	U	36	35	U	35	34	U	34	36	U	36
Chrysene	SVOA	27	U	27	27	U	27	27	U	27	26	U	26	26	U	26	27	U	27
Di-n-butylphthalate	SVOA	19	U	19	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
Di-n-octylphthalate	SVOA	20	U	20	20	U	20	20	U	20	19	U	19	19	U	19	20	U	20
Dibenz[a,h]anthracene	SVOA	26	U	26	26	U	26	26	U	26	25	U	25	25	U	25	26	U	26
Dibenzofuran	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Diethyl phthalate	SVOA	29	U	29	29	U	29	29	U	29	28	U	28	28	U	28	29	U	29
Dimethyl phthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Fluoranthene	SVOA	35	U	35	35	U	35	36	U	36	35	U	35	34	U	34	36	U	36
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	17	U	17	17	U	17	18	U	18
Hexachlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	50	U	50	48	U	48	48	U	48	50	U	50
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	20	U	20	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
Naphthalene	SVOA	30	U	30	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
Pentachlorophenol	SVOA	320	U	320	320	U	320	330	U	330	320	U	320	310	U	310	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Phenol	SVOA	18	U	18	18	U	18	18	U	18	17	U	17	17	U	17	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Equipment blanks)

CONSTITUENT	CLASS	J1JCW5 Equipment blank 5/26/11			J1B853 Equipment blank 6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.4	U	9.4	3.15	U	3.15
Acenaphthylene	PAH	8.5	U	8.5	3.15	U	3.15
Anthracene	PAH	2.9	U	2.9	3.15	U	3.15
Benzo(a)anthracene	PAH	3.0	U	3.0	3.15	U	3.15
Benzo(a)pyrene	PAH	6.0	U	6.0	3.15	U	3.15
Benzo(b)fluoranthene	PAH	4.0	U	4.0	3.15	U	3.15
Benzo(ghi)perylene	PAH	6.8	U	6.8	3.15	U	3.15
Benzo(k)fluoranthene	PAH	3.7	U	3.7	3.15	U	3.15
Chrysene	PAH	4.6	U	4.6	3.15	U	3.15
Dibenz[a,h]anthracene	PAH	10	U	10	3.15	U	3.15
Fluoranthene	PAH	12	U	12	3.15	U	3.15
Fluorene	PAH	5.0	U	5.0	3.15	U	3.15
Indeno(1,2,3-cd)pyrene	PAH	11	U	11	3.15	U	3.15
Naphthalene	PAH	11	U	11	3.15	U	3.15
Phenanthrene	PAH	11	U	11	3.15	U	3.15
Pyrene	PAH	11	U	11	3.15	U	3.15
Aldrin	PEST						
Alpha-BHC	PEST						
alpha-Chlordane	PEST						
beta-BHC	PEST						
Delta-BHC	PEST						
4,4'-DDD	PEST						
4,4'-DDE	PEST						
4,4'-DDT	PEST						
Dieldrin	PEST						
Endosulfan I	PEST						
Endosulfan II	PEST						
Endosulfan sulfate	PEST						
Endrin	PEST						
Endrin aldehyde	PEST						
Endrin ketone	PEST						
Gamma-BHC (Lindane)	PEST						
gamma-Chlordane	PEST						
Heptachlor	PEST						
Heptachlor epoxide	PEST						
Methoxychlor	PEST						
Toxaphene	PEST						

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Equipment blanks)

CONSTITUENT	CLASS	J1JCW5 Equipment blank 5/26/11			J1B853 Equipment blank 6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.6	U	2.6	13.2	U	13.2
Aroclor-1221	PCB	7.4	U	7.4	13.2	U	13.2
Aroclor-1232	PCB	1.8	U	1.8	13.2	U	13.2
Aroclor-1242	PCB	4.3	U	4.3	13.2	U	13.2
Aroclor-1248	PCB	4.3	U	4.3	13.2	U	13.2
Aroclor-1254	PCB	2.4	U	2.4	13.2	U	13.2
Aroclor-1260	PCB	2.4	U	2.4	13.2	U	13.2
1,2,4-Trichlorobenzene	SVOA	26	U	26	330	U	330
1,2-Dichlorobenzene	SVOA	20	U	20	330	U	330
1,3-Dichlorobenzene	SVOA	11	U	11	330	U	330
1,4-Dichlorobenzene	SVOA	13	U	13	330	U	330
2,4,5-Trichlorophenol	SVOA	9.2	U	9.2	330	U	330
2,4,6-Trichlorophenol	SVOA	9.2	U	9.2	330	U	330
2,4-Dichlorophenol	SVOA	9.2	U	9.2	330	U	330
2,4-Dimethylphenol	SVOA	61	U	61	330	U	330
2,4-Dinitrophenol	SVOA	310	U	310	1650	U	1650
2,4-Dinitrotoluene	SVOA	61	U	61	330	U	330
2,6-Dinitrotoluene	SVOA	26	U	26	330	U	330
2-Chloronaphthalene	SVOA	9.2	U	9.2	330	U	330
2-Chlorophenol	SVOA	19	U	19	330	U	330
2-Methylnaphthalene	SVOA	18	U	18	330	U	330
2-Methylphenol (cresol, o-)	SVOA	12	U	12	330	U	330
2-Nitroaniline	SVOA	46	U	46	1650	U	1650
2-Nitrophenol	SVOA	9.2	U	9.2	330	U	330
3+4 Methylphenol (cresol, m+p)	SVOA	83	U	83	330	U	330
3,3'-Dichlorobenzidine	SVOA	30	U	30	660	U	660
3-Nitroaniline	SVOA	67	U	67	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	300	U	300	330	U	330
4-Bromophenylphenyl ether	SVOA	18	U	18	330	U	330
4-Chloro-3-methylphenol	SVOA	61	U	61	330	U	330
4-Chloroaniline	SVOA	76	U	76	330	U	330
4-Chlorophenylphenyl ether	SVOA	19	U	19	330	U	330
4-Nitroaniline	SVOA	67	U	67	1650	U	1650
4-Nitrophenol	SVOA	90	U	90	1650	U	1650
Acenaphthene	SVOA	9.5	U	9.5	330	U	330
Acenaphthylene	SVOA	16	U	16	330	U	330
Anthracene	SVOA	16	U	16	330	U	330
Benzo(a)anthracene	SVOA	18	U	18	330	U	330
Benzo(a)pyrene	SVOA	18	U	18	330	U	330
Benzo(b)fluoranthene	SVOA	24	U	24	330	U	330
Benzo(ghi)perylene	SVOA	15	U	15	330	U	330

Attachment	1	Sheet No.	44 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Equipment blanks)

CONSTITUENT	CLASS	J1JCW5 Equipment blank 5/26/11			J1B853 Equipment blank 6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	37	U	37	330	U	330
Bis(2-chloro-1-methylethyl)ether	SVOA	21	U	21	330	U	330
Bis(2-Chloroethoxy)methane	SVOA	21	U	21	330	U	330
Bis(2-chloroethyl) ether	SVOA	15	U	15	330	U	330
Bis(2-ethylhexyl) phthalate	SVOA	68	JB	42	330	U	330
Butylbenzylphthalate	SVOA	40	U	40	330	U	330
Carbazole	SVOA	33	U	33	330	U	330
Chrysene	SVOA	25	U	25	330	U	330
Di-n-butylphthalate	SVOA	18	U	18	330	U	330
Di-n-octylphthalate	SVOA	18	U	18	330	U	330
Dibenz[a,h]anthracene	SVOA	24	JB	24	330	U	330
Dibenzofuran	SVOA	21	U	21	330	U	330
Diethyl phthalate	SVOA	27	U	27	330	U	330
Dimethyl phthalate	SVOA	13	U	13	330	U	330
Fluoranthene	SVOA	33	U	33	330	U	330
Fluorene	SVOA	17	U	17	330	U	330
Hexachlorobenzene	SVOA	27	U	27	330	U	330
Hexachlorobutadiene	SVOA	9.2	U	9.2	330	U	330
Hexachlorocyclopentadiene	SVOA	46	U	46	330	U	330
Hexachloroethane	SVOA	20	U	20	330	U	330
Indeno(1,2,3-cd)pyrene	SVOA	20	U	20	330	U	330
Isophorone	SVOA	16	U	16	330	U	330
N-Nitroso-di-n-dipropylamine	SVOA	29	U	29	330	U	330
N-Nitrosodiphenylamine	SVOA	20	U	20	330	U	330
Naphthalene	SVOA	29	U	29	330	U	330
Nitrobenzene	SVOA	19	U	19	330	U	330
Pentachlorophenol	SVOA	300	U	300	1650	U	1650
Phenanthrene	SVOA	16	U	16	330	U	330
Phenol	SVOA	17	U	17	330	U	330
Pyrene	SVOA	11	U	11	330	U	330

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Asbestos)

Sample location	HEIS Number	Sample Date	% Total Asbestos	Sample location	HEIS Number	Sample Date	% Total Asbestos
A3	J1B869	6/30/10	ND	D5	J1B8K2	6/29/10	ND
Duplicate of J1B856		6/30/10	ND	Duplicate of J1B8C0	J1B8L0	6/29/10	ND
A1	J1B867	6/30/10	ND	D1	J1B8J8	6/29/10	ND
A2	J1B868	6/30/10	ND	D2	J1B8J9	6/29/10	ND
A4	J1B870	6/30/10	ND	D3	J1B8K0	6/29/10	ND
A5	J1B871	6/30/10	ND	D4	J1B8K1	6/29/10	ND
A6	J1B872	6/30/10	ND	D6	J1B8K3	6/29/10	ND
A7	J1B873	6/30/10	ND	D7	J1B8K4	6/29/10	ND
A8	J1B874	6/30/10	ND	D8	J1B8K5	6/29/10	ND
A9	J1B875	6/30/10	ND	D9	J1B8K6	6/29/10	ND
A-9[a]	J1JVX3	6/16/11	ND	D10	J1B8K7	6/29/10	ND
A10	J1B876	6/30/10	ND	D11	J1B8K8	6/29/10	ND
A11	J1B877	6/30/10	ND	D12	J1B8K9	6/29/10	ND
A12	J1B879	6/30/10	ND	E-6	J1JCX1	5/31/11	ND
B8	J1B8F9	6/29/10	ND	Duplicate of J1JCT4	J1JCX8	5/31/11	ND
Duplicate of J1B887	J1B8H4	6/29/10	ND	E-1	J1JCW6	5/31/11	ND
B1	J1B8F2	6/29/10	ND	E-2	J1JCW7	5/31/11	ND
B2	J1B8F3	6/29/10	ND	E-3	J1JCW8	5/31/11	ND
B3	J1B8F4	6/29/10	ND	E-4	J1JCW9	5/31/11	ND
B4	J1B8F5	6/29/10	ND	E-5	J1JCX0	5/31/11	ND
B13[b]	J1B8F6	6/29/10	ND	E-7	J1JCX2	5/31/11	ND
B6	J1B8F7	6/29/10	ND	E-8	J1JCX3	5/31/11	ND
B7	J1B8F8	6/29/10	ND	E-9	J1JCX4	5/31/11	ND
B9	J1B8H0	6/29/10	ND	E-10	J1JCX5	5/31/11	ND
B10	J1B8H1	6/29/10	ND	E-11	J1JCX6	5/31/11	ND
B11	J1B8H2	6/29/10	ND	E-12	J1JCX7	5/31/11	ND
B12	J1B8H3	6/29/10	ND	F-2	J1JD00	5/26/11	ND
C8	J1B8J2	6/29/10	ND	Duplicate of J1JCV3	J1JD11	5/26/11	ND
Duplicate of J1B8B0	J1B8J7	6/29/10	ND	F-1	J1JCX9	5/26/11	ND
C1	J1B8H5	6/17/10	ND	F-3	J1JD01	5/26/11	ND
C2	J1B8H6	6/17/10	ND	F-4	J1JD02	5/26/11	ND
C3	J1B8H7	6/17/10	ND	F-5	J1JD03	5/26/11	ND
C4	J1B8H8	6/17/10	ND	F-6	J1JD04	5/26/11	ND
C5	J1B8H9	6/17/10	ND	F-7	J1JD05	5/26/11	ND
C6	J1B8J3	6/17/10	ND	F-8	J1JD06	5/26/11	ND
C7	J1B8J1	6/29/10	ND	F-9	J1JD07	5/26/11	ND
C9	J1B8J0	6/29/10	ND	F-10	J1JD08	5/26/11	ND
C10	J1B8J4	6/29/10	ND	F-11	J1JD09	5/26/11	ND
C11	J1B8J5	6/29/10	ND	F-12	J1JD10	5/26/11	ND
C12	J1B8J6	6/29/10	ND	Equipment blank	J1B853	6/30/10	
				Equipment blank	J1JCW5	5/26/11	

Attachment	2	Sheet No.	1 of 1
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Calculation Brief Distribution Sheet

H, akb 9-15-11

Calculation Number: 0100~~F~~-CA-V0178

128-H-1 Waste Site Cleanup Verification 95% UCL Calculation, Rev. 1

TITLE	NAME	MSIN	COPIES
Originator	J. D. Skoglie	H4-23	**Electronic**
Checker	T. E. Queen	H4-23	**Electronic**
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Approver	D. F. Obenauer	N3-30	**Electronic**
CVP Files			
Document Control	M. L. Cockrum	H4-11	**1**
100 Area Project Files	L. R. Shelp	H4-23	**Electronic**
Calc. Brief Files	L. R. Shelp	H4-23	**Original**
Author	C. H. Dobie	H4-23	**Electronic**
Other			

Date Submitted: 7/28/11 Originator: M. L. Proctor Phone: 372-9227	**WASTE SITE RECLASSIFICATION FORM** Operable Unit(s): 100-HR-2 Waste Site Code: 128-H-1 Type of Reclassification Action: Closed Out ☐ Interim Closed Out ☒ No Action ☐ RCRA Postclosure ☐ Rejected ☐ Consolidated ☐	Control Number: 2010-062

This form documents agreement among parties listed authorizing classification of the subject unit as Closed Out, Interim Closed Out, No Action, RCRA Postclosure, Rejected, or Consolidated. This form also authorizes backfill of the waste management unit, if appropriate, for Closed Out and Interim Closed Out units. Final removal from the NPL of No Action and Closed Out waste management units will occur at a future date.

Description of current waste site condition:

The 128-H-1, 100-H Burning Pit waste site is a large natural depression approximately 170 by 160 m (565 by 535 ft) that was used as a burn pit for disposal of combustible materials in the 100-H Area. The 128-H-1 waste site is identified as a remaining site for remediation in the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 1999). Remediation of the 128-H-1 waste site was performed from June 23, 2009 through May 25, 2011. The selected remedy involved (1) excavating the site to the extent required to meet specified soil cleanup levels, (2) disposing of contaminated excavation materials at the Environmental Restoration Disposal Facility (ERDF) at the 200 Area of the Hanford Site, (3) demonstrating through verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification as Interim Closed Out. Approximately 22,627 bank cubic meters (29,595 bank cubic yards) of debris (e.g., wood, concrete, glass, ash, and batteries) plus contaminated soil was removed, stockpiled onsite, and later disposed at the ERDF.

Basis for reclassification:

This site will support future unrestricted land uses that can be represented (or bounded) by a rural-residential scenario. Sampling results also showed that this site will support unrestricted future use of shallow-zone soil (i.e., surface to 4.6 m [15 ft]) and is protective of groundwater and the Columbia River. The 128-H-1 waste site was excavated to a maximum depth of approximately 7 m (23 ft) below grade, extending into the deep zone (greater than 4.6 m [15 ft] deep); however, the site was closed out using the shallow zone direct exposure, groundwater, and river protection cleanup criteria. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 128-H-1, 100-H Burning Pit Waste Site* (attached). The site extended into the deep zone (greater than 4.6 m [15 ft] deep); however, the site was closed out using the shallow zone direct exposure, groundwater, and river protection cleanup criteria. Institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the site are not required.

Regulator Comments:

Approval of this WSRF documents regulator agreement that the 128-H-1, 100-H Burning Pit Waste Site qualifies for "Interim Closed Out" under this Interim Action ROD. In addition, Ecology has evaluated the data for this site against WAC 173-340 (2007) clean-up levels for direct contact, groundwater protection, and river protection. This evaluation is documented in the letter transmitting Ecology's approval of the site's interim reclassification to "Interim Closed Out."

Waste Site Controls:

Engineered Controls: Yes ☐ No ☒ Institutional Controls: Yes ☐ No ☒ O&M requirements: Yes ☐ No ☒
If any of the Waste Site Controls are checked Yes specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents.

M. S. French	M S French	12/20/11
DOE Federal Project Director (printed)	Signature	Date
N. Menard		
Ecology Project Manager (printed)	Signature	Date
NA		
EPA Project Manager (printed)	Signature	Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 128-H-1, 100-H BURNING PIT WASTE SITE

Attachment to Waste Site Reclassification Form 2010-062

November 2011

REMAINING SITES VERIFICATION PACKAGE FOR THE 128-H-1, 100-H BURNING PIT WASTE SITE

EXECUTIVE SUMMARY

The 128-H-1 waste site is located in a large natural depression in the northwestern corner of the 100-HR-2 Operable Unit, approximately 15 m (50 ft) east of the west perimeter road and north of the 126-H-1 ash pit. The Washington State Plane coordinate pair listed in the Waste Information Data System (N 153277, E 577322) identifies an approximate center point for the site as a whole. Historical documentation indicates the pit was first used as a burn pit for disposal of buildings, homes, and sheds removed or demolished as part of clearing the site for eventual construction of the 100-H Reactor facilities. Subsequently, the site was used as a burn pit for disposal of trash, rubbish, and other construction-related waste during construction of the 105-H Reactor and its ancillary facilities. From 1949 through 1965 this site was the primary burn pit for disposal of nonradioactive combustible waste in the 100-H Area. Historical documentation also reports water seepage into the pit at periods of high flood stages of the Columbia River.

Remediation of the 128-H-1 waste site was performed from June 23, 2009, through May 25, 2011. Approximately 16,310 bank cubic meters (21,333 bank cubic yards) of debris (e.g., wood, concrete, glass, ash, and batteries) plus contaminated soil was removed, stockpiled onsite, and later disposed at the Environmental Restoration Disposal Facility.

Following remediation, verification sampling was conducted in June 2010. Results showed that six sample locations within the burn pit excavation area and one sample in the soil stockpile area exceeded cleanup criteria for various contaminants. As a result, from April 11 through May 26, 2011, additional remedial excavation was performed to remove contaminated soils in the burn pit excavation and stockpile sample locations. On May 26, 2011, additional samples were collected from the entire burn pit excavation and the new waste staging pile area using a new sample design. On June 16, 2011, a sample was also taken from the original failed location of the stockpile area. These results indicated that, following the additional remediation, residual contaminant concentrations met the remedial action objectives (RAOs) and remedial action goals (RAGs) for the 128-H-1 waste site.

Previous to the Manhattan Project, several orchards existed on the Hanford Site in the 100 Area. The waste staging area footprint for the 128-H-1 waste site was located to the north of the 128-H-1 waste site and outside of the waste site boundary. Prior to performing remediation, 0.3 m (1 ft) of topsoil was scraped from this area and staged for post-remediation reuse. It was subsequently determined that surface soil scraped from this area contained arsenic and lead due to historic pesticide use because the waste staging area footprint was located in a historic orchard area. Therefore, as agreed to by the Tri-Parties (Tri-Party Agreement Change Notice TPA CN 401 [DOE-RL 2010]), lead and arsenic contamination that resulted from pesticide use before the Manhattan Project are excluded as COPCs and will be discussed in a future *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) document.

The 128-H-1 waste site was identified as a remaining site for remediation in the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999) and the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2009b). A summary of the cleanup evaluation for the soil results compared to the applicable cleanup criteria is presented in Table ES-1. The results of the verification sampling are used to make reclassification decisions for the 128-H-1 waste site in accordance with the TPA-MP-14 procedure in the *Tri-Party Agreement Handbook Management Procedures* (DOE-RL 2007).

Table ES-1. Summary of Remedial Action Goals for the 128-H-1 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain dose rate of less than 15 mrem/yr dose rate above background over 1,000 years.	Radionuclides were not COPCs for the 128-H-1 waste site.	NA
Direct Exposure – Nonradionuclides	Attain individual COPC RAGs.	All individual COPC concentrations are below the direct exposure criteria. Arsenic was detected above direct exposure criteria in the surface soil stockpile and staging pile area footprint, but is attributable to historical orchards in the area. Therefore, arsenic has been excluded as a COPC per TPA-CN-401 (DOE-RL 2010).	Yes
Direct Contact Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	All individual hazard quotients are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotient (1.2×10^{-2}) is <1.	
Risk Requirements – Nonradionuclides	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	All excess cancer risk for individual carcinogens is $<1 \times 10^{-6}$.	Yes
	Attain a cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The direct exposure total excess cancer risk (9.9×10^{-7}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single-COPC groundwater and river protection RAGs.	Radionuclides were not COPCs for the 128-H-1 waste site.	NA
	Attain national primary drinking water standards [a]: 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.		
	Meet drinking water standards for alpha emitters: the most stringent of 15 pCi/L MCL or 1/25th of the derived concentration guides from DOE Order 5400.5 [b].		
	Meet total uranium standard of 30 µg/L (21.2 pCi/L) [c].		

Table ES-1. Summary of Remedial Action Goals for the 128-H-1 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	Concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and aroclor-1260 are present at concentrations slightly above soil RAGs for groundwater and/or Columbia River protection. However, an evaluation based upon RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b) shows that residual concentrations of these constituents are predicted to be protective of groundwater and the river [d].	Yes

[a] "National Primary Drinking Water Regulations" (40 *Code of Federal Regulations* 141).

[b] *Radiation Protection of the Public and Environment* (DOE Order 5400.5).

[c] Based on the isotopic distribution of uranium in the 100 Area, the 30 µg/L MCL corresponds to 21.2 pCi/L. Concentration-to-activity calculations are documented in *Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater* (BHI 2001).

[d] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and aroclor-1260 in the surface soil stockpile, original waste staging pile area, excavation scraped soil area, east excavation, and new waste staging pile area are not expected to migrate more than 1.8 m (6.0 ft) vertically in 1,000 years (based on the contaminant with the lowest distribution coefficient of the contaminants exceeding RAGs, lead, with a distribution coefficient value of 30 mL/g). With the exception of the west excavation area where the excavation extended to the water table, the vadose zone underlying the waste site is approximately 6.0 m (20.0 ft) thick at the deepest portion of the excavation.. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River.

COPC = contaminant of potential concern
DOE = U.S. Department of Energy
MCL = maximum contaminant level
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)

In accordance with this evaluation, the verification sampling results support a reclassification of this site to Interim Closed Out. The current site conditions achieve the RAOs and the corresponding RAGs established in the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2009b). The verification sample results show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. The site extended into the deep zone (greater than 4.6 m [15 ft] deep); however, the site was closed out using the shallow zone direct exposure, groundwater, and river protection cleanup criteria. Institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the site are not required.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 128-H-1 waste site contaminants of potential concern and other constituents. The U.S. Environmental Protection Agency ecological soil screening levels were exceeded for arsenic, lead, manganese, vanadium, and zinc. Ecological screening levels from *Washington Administrative Code* 173-340 were exceeded for arsenic, barium, boron, lead, mercury, and vanadium. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of barium, manganese, mercury, vanadium, and zinc are below Hanford Site or Washington State background values (note that state background values are only used when Hanford Site background values are not available), it is believed that the presence of these constituents does not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

REMAINING SITES VERIFICATION PACKAGE FOR THE 128-H-1, 100-H BURNING PIT WASTE SITE

STATEMENT OF PROTECTIVENESS

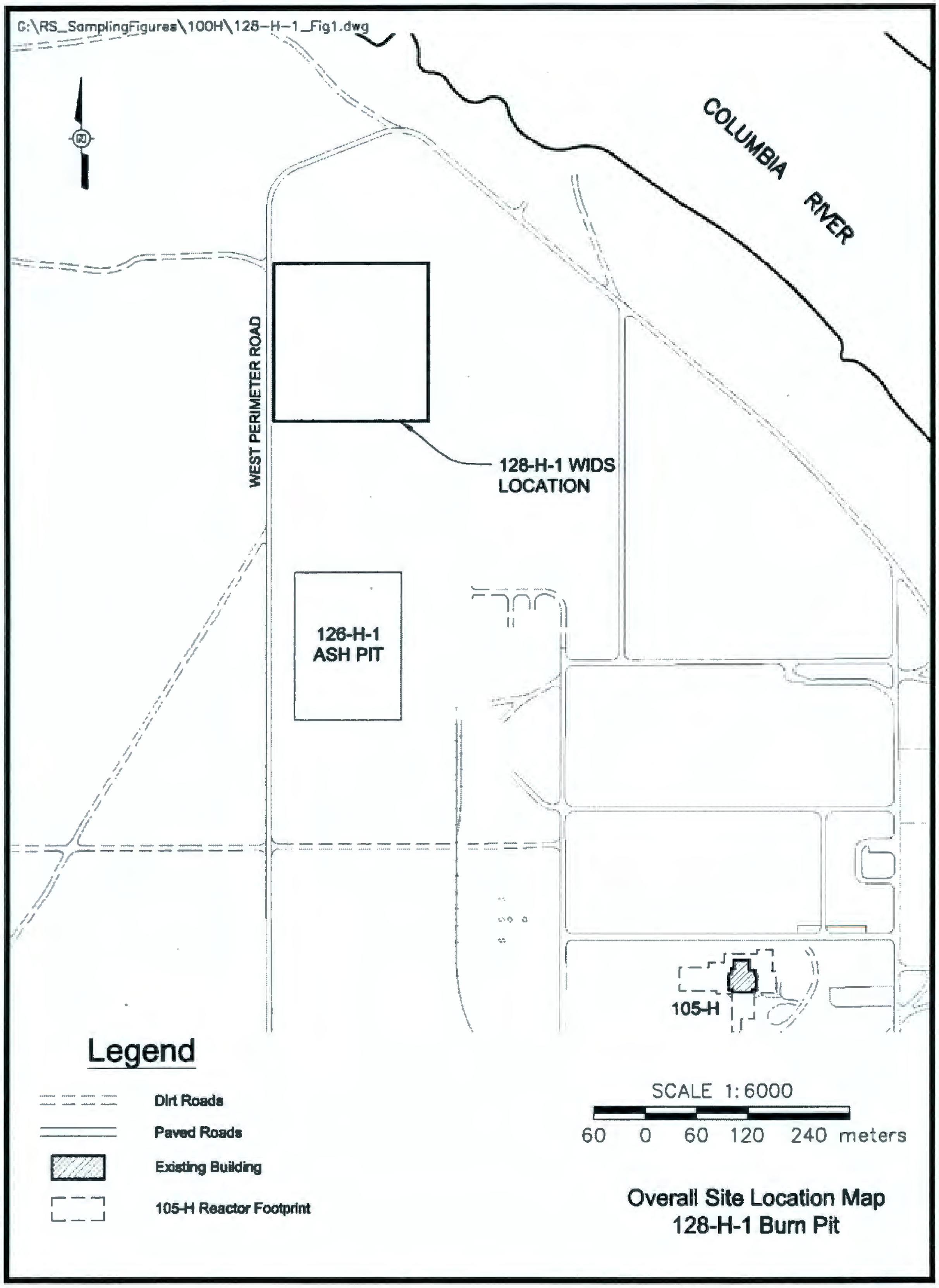
This report demonstrates that the 128-H-1, 100-H Burning Pit waste site meets the remedial action objectives (RAOs) and remediation action goals (RAGs) for Interim Closed Out as established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2009b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. The site extended into the deep zone (greater than 4.6 m [15 ft] deep); however, the site was closed out using the shallow zone direct exposure, groundwater, and river protection cleanup criteria.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 128-H-1 waste site contaminants of potential concern and other constituents (Appendix A). The U.S. Environmental Protection Agency (EPA) ecological soil screening levels were exceeded for arsenic, lead, manganese, vanadium, and zinc. Ecological screening levels from *Washington Administrative Code* 173-340 were exceeded for arsenic, barium, boron, lead, mercury, and vanadium. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of barium, manganese, mercury, vanadium, and zinc are below Hanford Site or Washington State background values (note that state background values are only used when Hanford Site background values are not available), it is believed that the presence of these constituents does not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

GENERAL SITE INFORMATION AND BACKGROUND

The 128-H-1 waste site is located in a large natural depression in the northwestern corner of the 100-HR-2 Operable Unit, approximately 15 m (50 ft) east of the west perimeter road and north of the 126-H-1 ash pit (Figure 1). The Washington State Plane coordinate pair listed in the Waste Information Data System (WIDS) (N 153277, E 577322) identifies an approximate center point for the site as a whole. The waste site measures approximately 170 by 160 m (565 by 535 ft).

Figure 1. The 128-H-1 Waste Site Location Map.



Before remediation began the site was partially divided by a north-south earthen berm, and dense tumbleweeds bordered the western edge of the depression along the west perimeter road. Within the depression, there was scattered surface debris that included wood, glass, metal, wire, cable, spray paint cans, transite, and clay pipe. During a December 2005 site visit, burned material, fly ash, and cinder was observed to cover the depression floor, and there was tar-stained soil at the southern end of the pit. A majority of the surface debris was located between the earthen berm and the eastern edge of the site. At the southern end of the site, there was a manmade pit filled with tumbleweeds. Debris was visible through the tumbleweeds and included cans, pails or small drums, and concrete.

Historic orchards were present in this area prior to the construction of the 105-H Reactor and its ancillary facilities (BHI 1999). Historical orchard sites are not identified as waste sites in the Remaining Sites ROD (EPA 1999). More specifically, the distribution of concentrations of lead and arsenic within the waste staging area footprint and soil stockpile areas in the northern portion of the 128-H-1 waste site indicate that the surface soil in this area was contaminated with lead-arsenate pesticides. Figure 2 depicts the pre-Hanford agricultural locations and Figure 3 shows the 128-H-1 WIDS boundary (blue) in relation to the waste staging pile (orange) area and previous orchard lands (green boundary). The provided map of the Hanford Site orchard areas in 1943 indicates that the 128-H-1 waste site is located in the Hanford Platted Lands area.

The 128-H-1, 100-H Burning Pit was an inactive, nonradioactive hazardous solid waste site that operated from 1949 through 1965 (BHI 1995). It was the primary burn pit for the 100-H Area and was located in a large natural depression. The site was reportedly used for the disposal of nonradioactive combustible materials such as paint waste, office waste, and chemical solvents (BHI 1995). Waste oil containing polychlorinated biphenyls (PCBs) may have been disposed here (WCH 2006a). Old signs were posted at the site that read, "Warning, Do Not Deposit Salvable Material." Figure 4 is a 1955 aerial photograph of the site, showing the location of the burn pit.

Historical documentation indicates the pit was first used as a burn pit for disposal of buildings, homes, and sheds removed or demolished as part of clearing the site for eventual construction of the 100-H Reactor facilities (GE 1952). The burn pit was then subsequently used for disposing of trash, rubbish, and other construction-related waste. Historical documentation also suggests water seepage into the pit at periods of high flood stages of the Columbia River (GE 1952).

Geophysical Investigation

Two geophysical surveys were performed for the 128-H-1 burn pit. The first geophysical survey was performed in August 2004, in order to locate and map any significant accumulations of buried debris that might occur within the depression (BHI 2004). Electromagnetic induction and magnetic total field/vertical gradient were used to survey the site. Much of the surficial debris was found to be concentrated in two locations. One was a 40-m (131-ft)-diameter area centered at about N230/E140, and the other was located along a north-south linear at E256. These two areas were also noted to have a significant amount of fly ash on the surface. Ferrous debris was scattered across much of the site, with higher concentrations in the northern half of the site.

Figure 2. Historic Orchard Locations (1943).

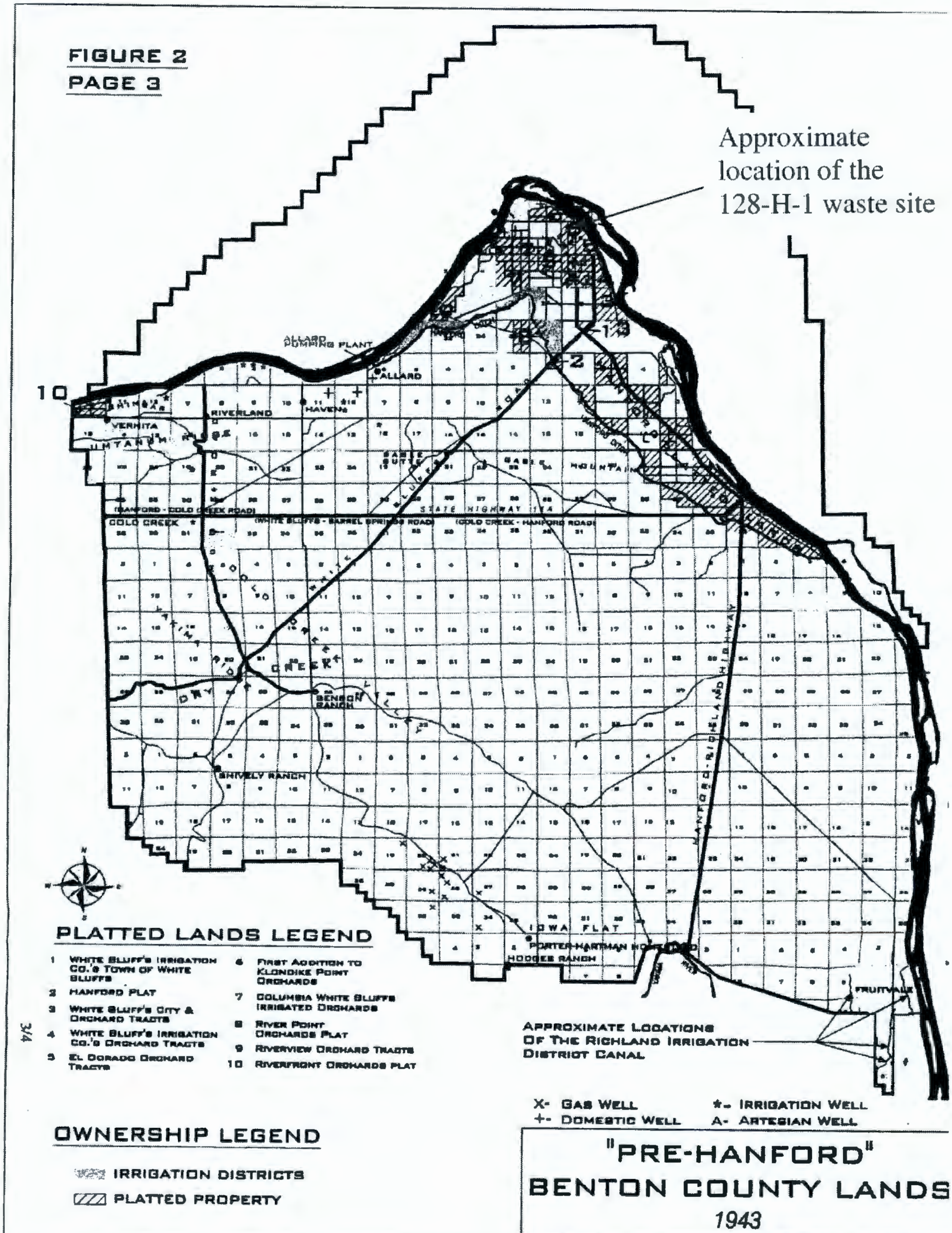
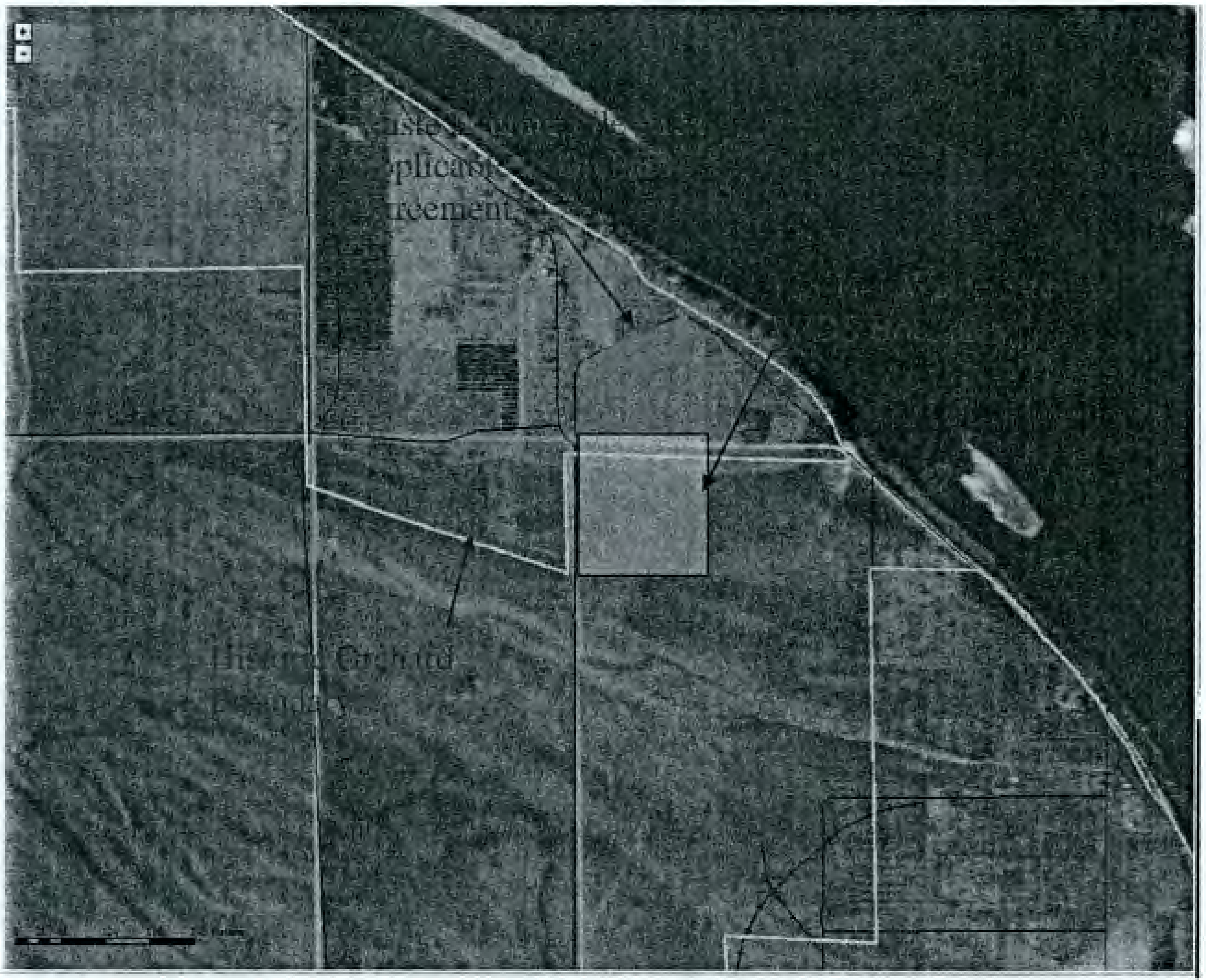
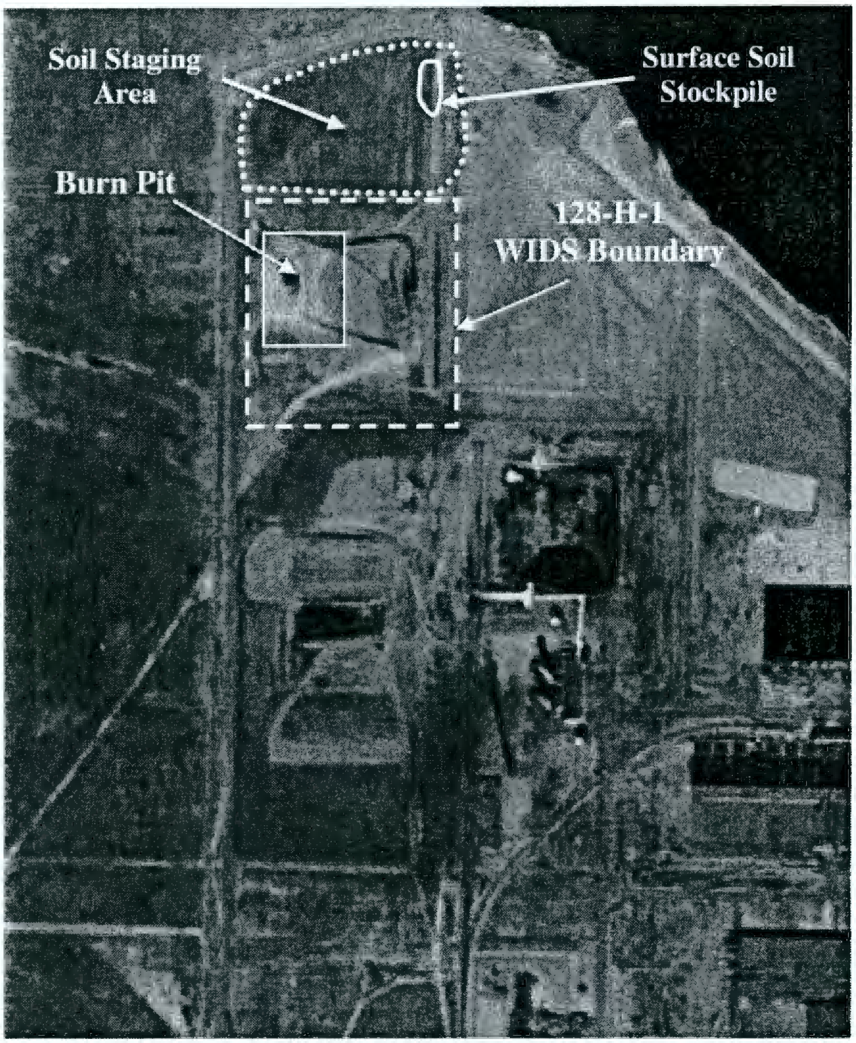


Figure 3. Historic Orchard Locations and the 128-H-1 Waste Site [a].



[a] BHI, 1999, *Pre-Hanford Agricultural History: 1900-1943*, BHI-01326, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

Figure 4. 128-H-1 Burning Pit Location Map.



Two anomalies, determined to be pipelines, were found during the geophysical investigations. One trends east-west at the southern end of the burn pit, and the other trends north-south along the eastern edge of the burn pit. The north-south pipeline has been identified as 100-H-51:5 and the east-west pipeline is part of the 100-H-35 pipelines. A third pipeline trending north-south along the southwest side of the site was not discussed in the geophysics report, but was encountered during site remediation and has been identified as a discovery site, 100-H-56.

The second geophysical survey was performed in February 2006 as an extension of the original geophysical investigation (WCH 2006b) to locate and map any significant accumulations of buried debris in the area north of the 128-H-1 burn pit. The survey grid was extended 60 m (200 ft) north of the original burn pit survey. No significant buried anomalies were identified within the extension. Some widely scattered, small magnetic surface anomalies were detected, but they did not appear to be related to the burn pit. Figure 5 provides a map of the surface features observed during the geophysical survey and Figure 6 shows the combined results for the two geophysical surveys.

Figure 5. Surface Feature Map for the 128-H-1 Waste Site.

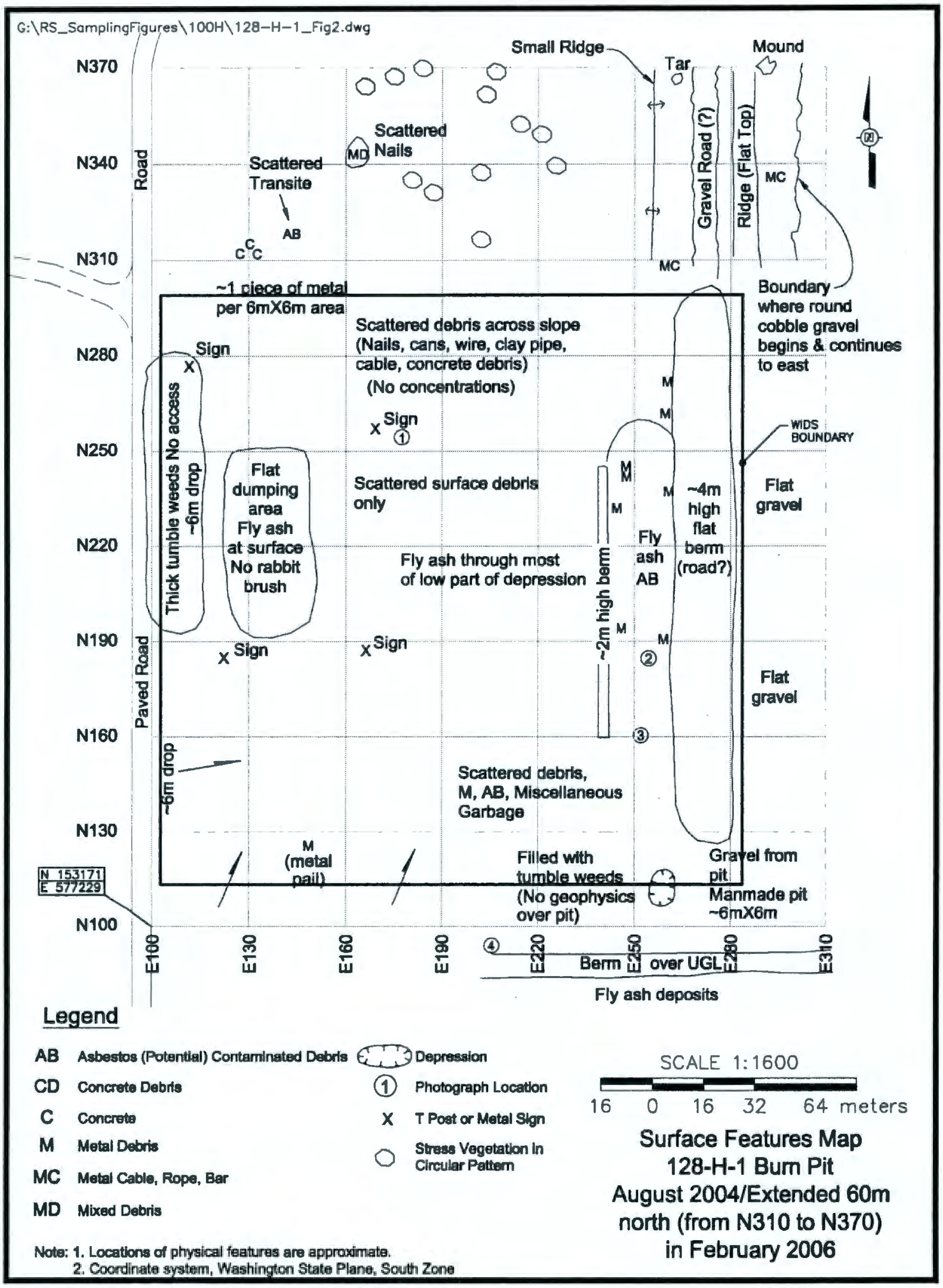
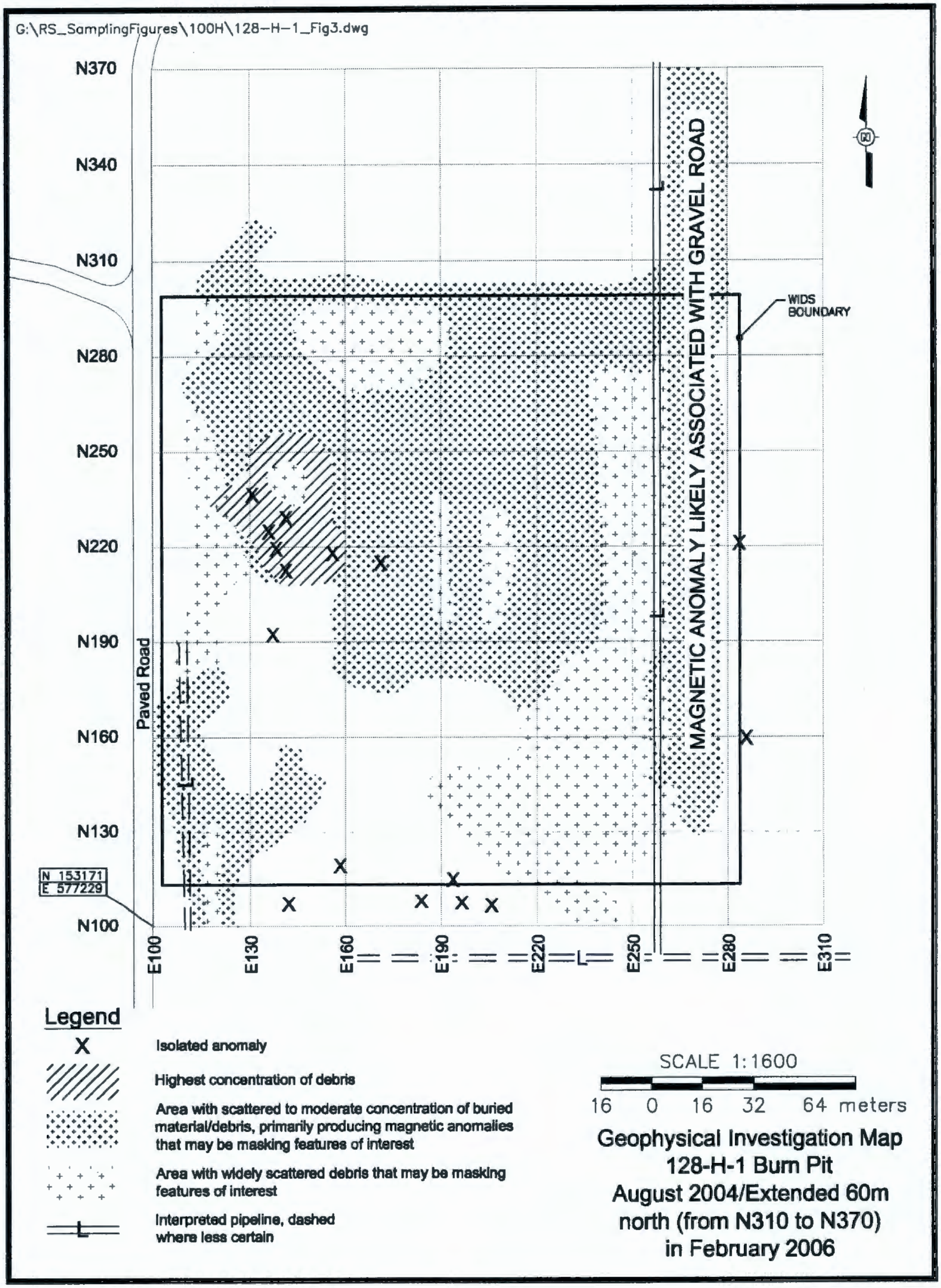


Figure 6. Geophysical Investigation Map for the 128-H-1 Waste Site.



REMEDIAL ACTION SUMMARY

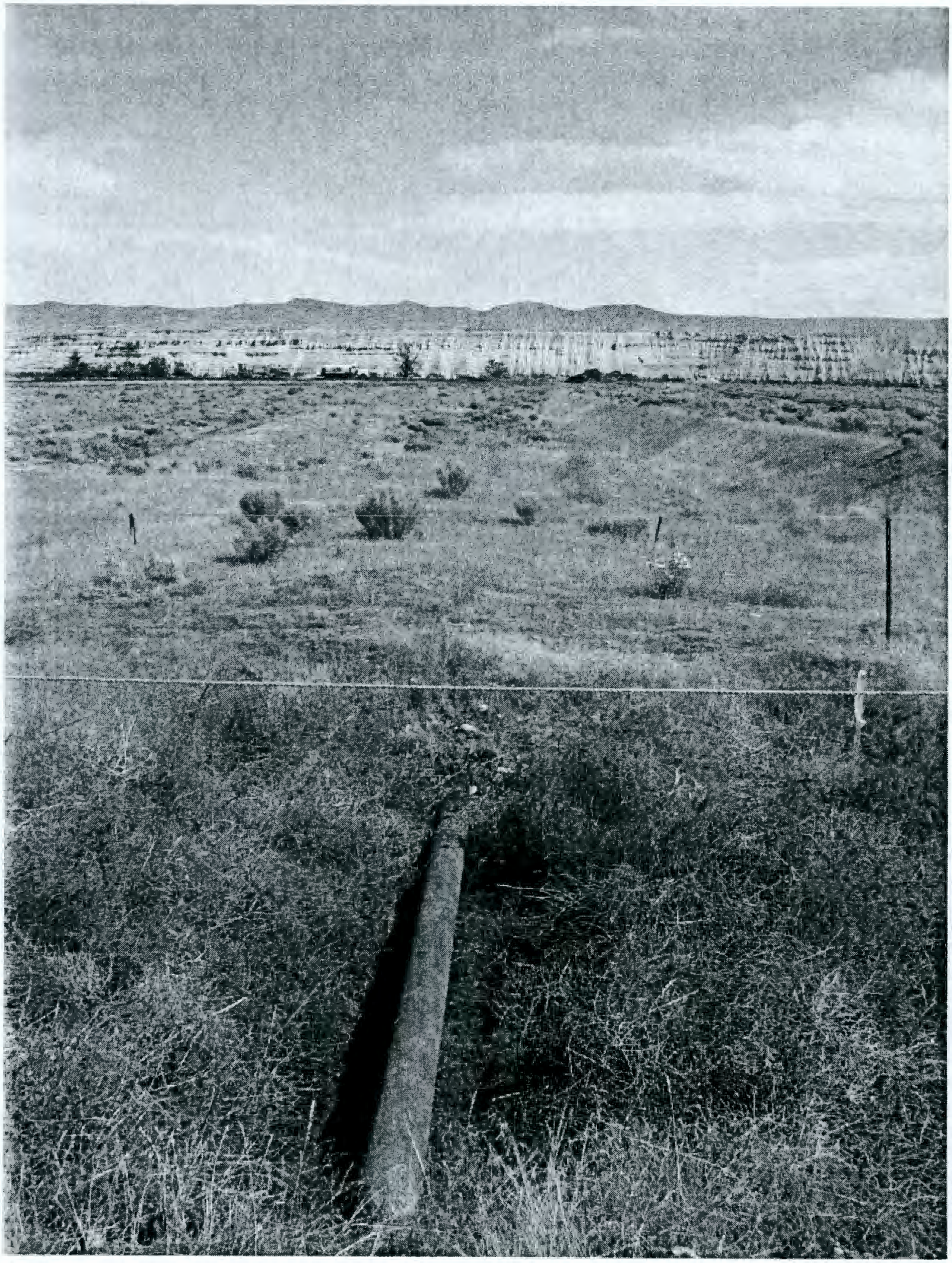
Remediation of the 128-H-1 waste site was performed from June 23, 2009, through May 26, 2011. Approximately 16,310 bank cubic meters (BCM) (21,333 bank cubic yards [BCY]) of debris (e.g., wood, concrete, glass, ash, and batteries) and contaminated soil was removed, stockpiled onsite, and later disposed at the Environmental Restoration Disposal Facility (EDRF). Prior to performing remediation, 0.3 m (1 ft) of topsoil was removed in the waste staging area footprint and stockpiled for post-remediation use (Figure 7). This fine-grained soil will be redistributed to the appropriate locations across the site as surface soil to support revegetation.

Figure 7. Grubbing Waste Stockpile Area (June 23, 2009).

One foot of soil was scraped from the surface of the waste site and disposed at the Environmental Restoration Disposal Facility (ERDF) (Figure 8). This action was performed to encompass removal of all surface debris, including the tar-stained surface soil that was observed during the December 2005 site visit. On May 12, 2010, a walkdown of the site was performed to verify that tar-stained soil was not present. Additionally, the "man-made pit" at the southern end of the site that was identified during the geophysical survey (Figure 5) and noted in the December 2005 site visit as having visible debris obscured by tumbleweeds, was further evaluated. The tumbleweeds were pushed aside and a steel pipeline was found running north-south through the pit (Figure 9). No other debris was found in the pit. Since the pit is located outside of the WIDS boundary and no debris was found present, no further evaluation of the pit will be performed. The pipeline running through this pit was identified as the 100-H-51:5 pipeline and will be sampled as part of the 100-H-51:5 confirmatory sampling activity.

Figure 8. Removal of Surface Soil Over Waste Site (July 8, 2009).

Figure 9. Exposed Portion of 100-H-51:5 on 128-H-1 Boundary.



On July 6, 2009, a 4-in.-diameter water line was encountered during removal of surficial soil within the waste site (Figure 10). Approximately 37.8 L (10 gal) of residual water drained via gravity from the pipeline. A soil sample (J191C5) associated with the release from the pipeline was collected and the results are included in Appendix B. This water line trends north-south and coincides with the pipeline identified from N100 to N190 on the geophysical survey (Figure 6). The pipeline has been identified as a discovery site in WIDS (100-H-56).

Figure 10. Water Line Encountered During Surface Soil Removal Activities (July 6, 2009).

Excavation of the burn pit area (Figures 11 and 12) began in early July 2009 and proceeded to a maximum depth of approximately 7 m (23 ft). Prior to remediation, a test pit was excavated in the burn pit area to a depth of 2.5 m (8 ft) with a soil sample (J18X02) containing ash collected to support determination of the waste characterization profile. Batteries, glass, concrete, wood, ash associated with burning, and a blue-green material (J19281) were found in the burn area. The blue-green material was cake-like, localized, and contained high concentrations of metals. During remediation, standing water was encountered on July 30, 2009. On September 8, 2009, in-process soil samples (J195T7, J195T6, and J195T8) were collected that indicated the presence of residual contamination exceeding remedial goals (Figure 13); some debris was also present. These samples were noted to contain ash associated with burning. The results are provided in Appendix B.

Figure 11. Initial Excavation of the Burn Pit Area (July 15, 2009).

Figure 12. Excavation of the Burn Pit Area (July 29, 2009).

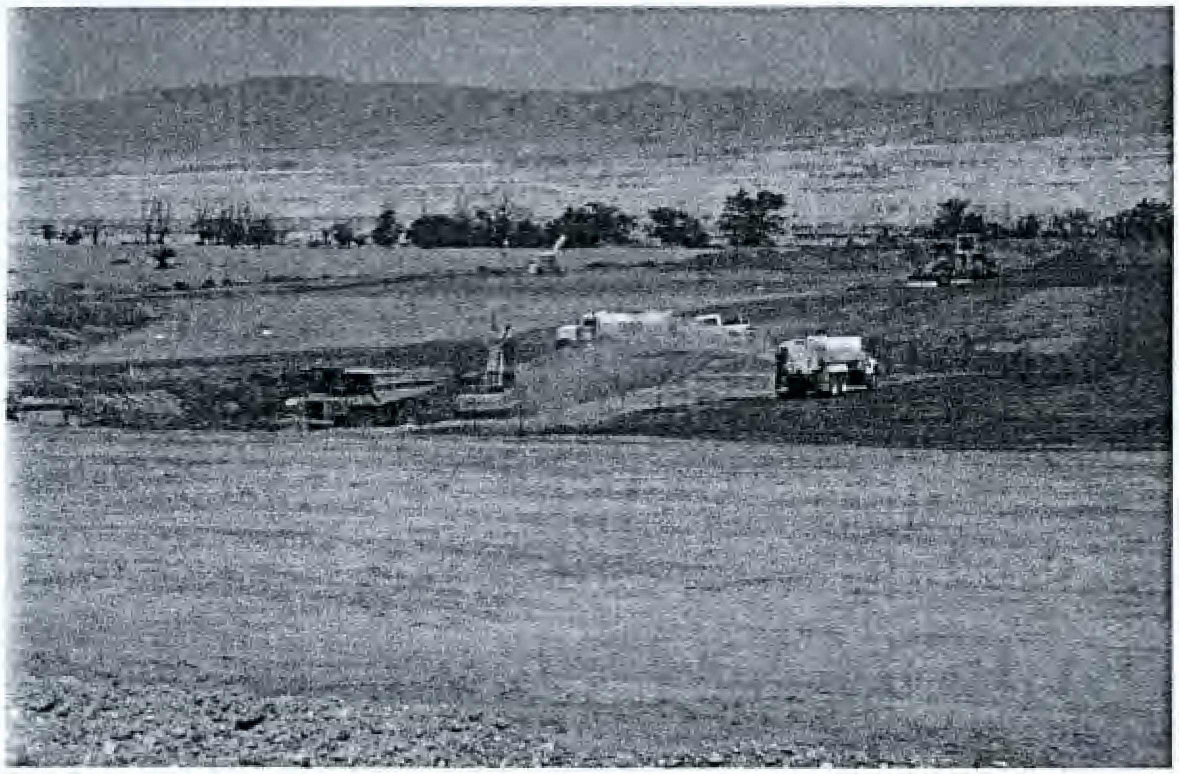
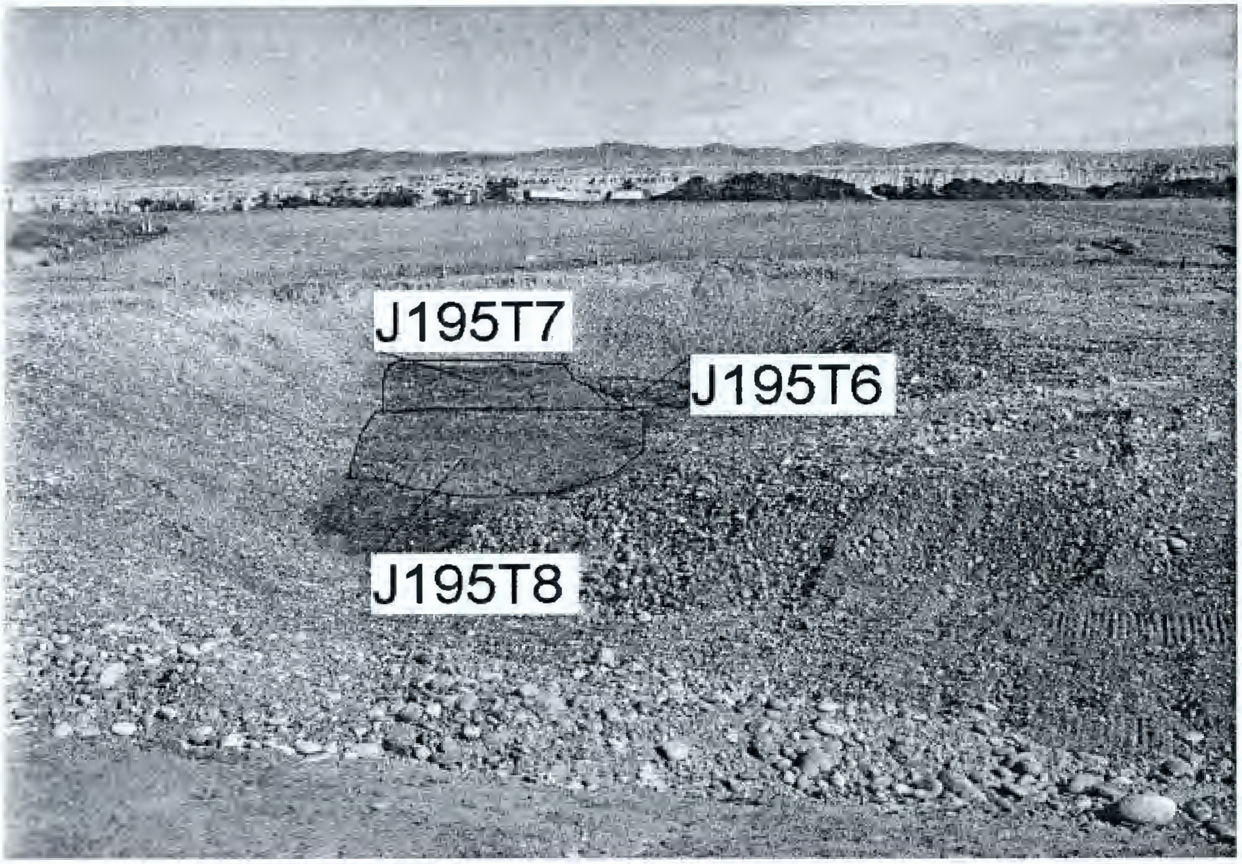


Figure 13. In-Process Soil Sample Locations (September 8, 2009).



From October 28 through November 2, 2009, additional excavation was performed with removal of debris and approximately 0.3 m (1 ft) of additional soil at the base of the excavation. Figure 14 shows standing water within the burn pit excavation.

Additional Remediation

Following verification sample analysis it was determined that additional remediation was needed because some sample locations exceeded cleanup criteria. After further review and agreement from The Washington Department of Ecology (Ecology), a new remediation design was implemented and the entire burn pit area was additionally excavated as per the new design (Figure 15). A new stockpile waste staging area that consisted of two locations was needed for the additional remediation of the burn pit. Additionally, because of an elevated dieldrin verification sample result, one sample location (A9) in the soil stockpile area was also remediated to 1.0 m (3.3 ft) and resampled, using the original sample design and contaminant of potential concern (COPC) list. This extra remediation began March 29, 2011 and continued to May 10, 2011. Approximately 5,867 BCM (7,674 BCY) of debris and contaminated soil was removed, stockpiled onsite, and later disposed at the ERDF.

Figure 14. Standing Water in the 128-H-1 Burn Pit Excavation (November 2, 2009).

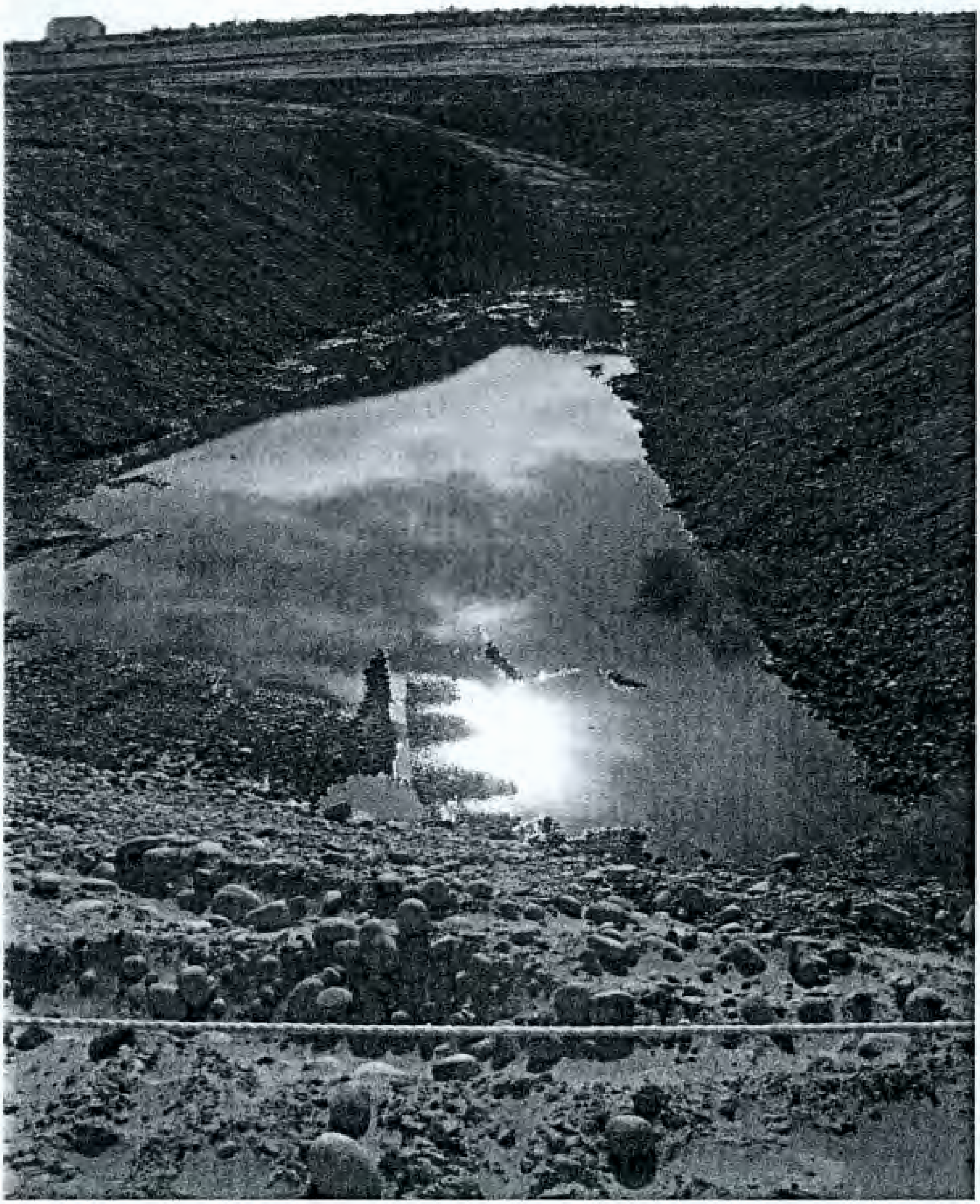
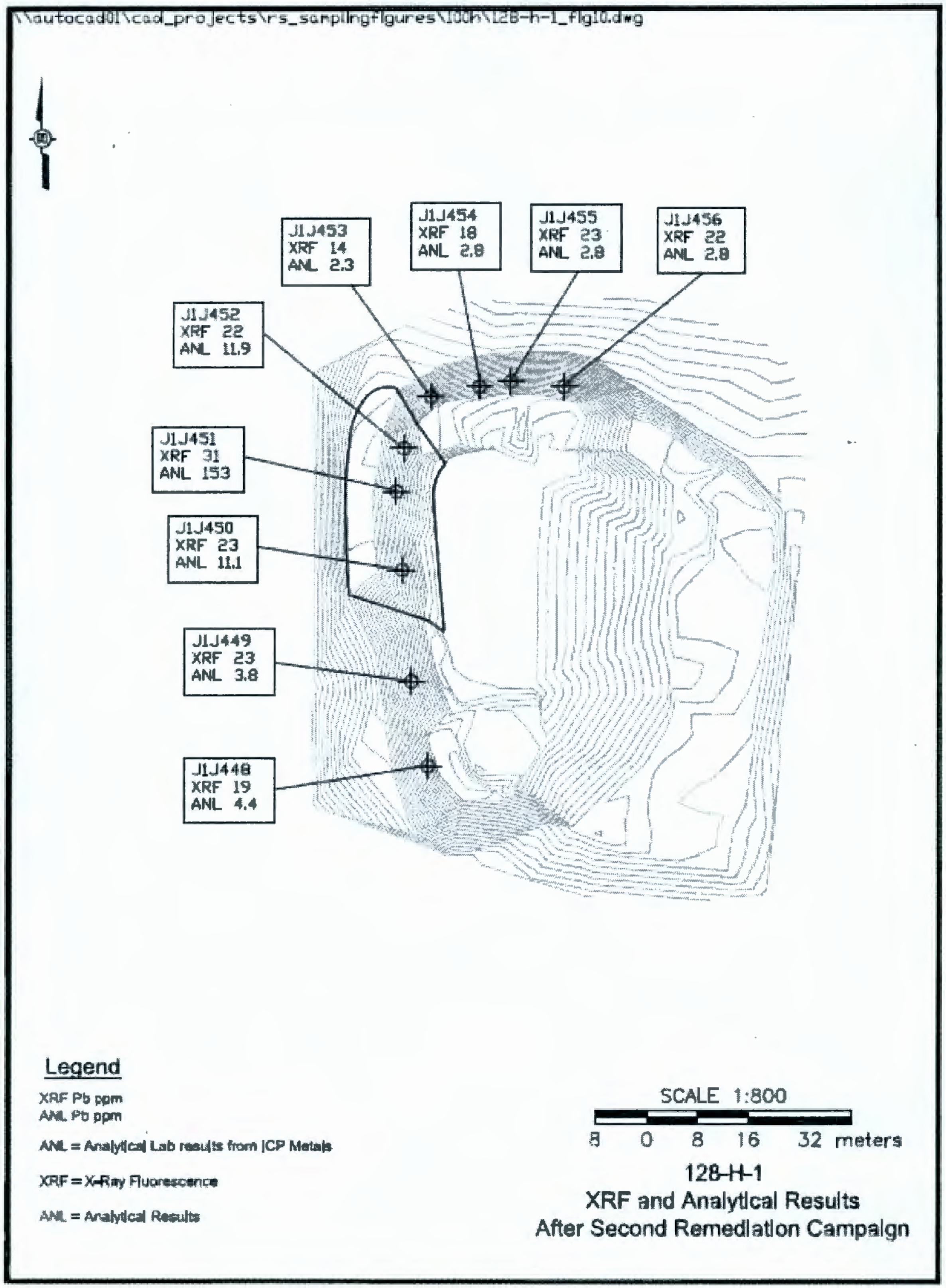


Figure 15. Completion of Second Remediation Effort at the Burn Pit Area (May 18, 2011).

Following the additional excavation of the burn pit area, x-ray fluorescence (XRF) was utilized to determine the areas containing the highest contamination within the re-excavated area. Nine areas were chosen to be sampled for inductively coupled plasma (ICP) metals analysis on May 9, 2011 and these in-process samples are included in Appendix B (WCH 2011). The results show three sample locations that exceeded RAGs for lead, including one location that also exceeded for copper and zinc. Further remediation at these failed locations (J1J450, J1J451, and J1J452 in Figure 16) occurred on May 25, 2011. Approximately 450 BCM (589 BCY) of debris and contaminated soil was removed and disposed at the EDRF.

Another XRF survey was conducted after the excavation of these three additional areas was complete (Figure 16). XRF results were determined to be adequate and soil samples were not taken after this additional remediation. The project then proceeded with verification sampling. A new sample design for the burn pit area was developed because the boundary for the excavation was expanded during excavation activities. All samples were evaluated using the original COPC list. The original sample results for the burn pit excavation are included in Appendix C.

Figure 16. Additional Remediation Areas Following In-Process Sample Results.



Rewetted Zone Discussion and Evaluation of Groundwater Sample Results

Remediation of the vadose zone is believed to be complete; however, questions remain concerning the potential for residual soil contamination in the rewetted zone, in saturated sediments, and in the groundwater. Closeout sampling for the 128-H-1 waste site addresses residual contamination in the vadose zone with evaluation of protection of groundwater and Columbia River via modeling. However, in this case, the excavation had encountered the water table. Fluctuations in historical groundwater elevations have likely resulted in debris/contaminants in the burn pit coming in contact with groundwater.

Because removal of contaminated soil and debris within the burn pit (Area E) at the 128-H-1 waste site extended beyond the planned excavation boundaries and into groundwater, the Washington Closure Hanford (WCH) Field Remediation Project personnel met with the CH2MHill Hanford Plateau Remediation Contractor (CHPRC) Groundwater Project personnel in November 2009. Six informational soil samples were collected from the rewetted zone (Figure 17) to supplement information concerning the conceptual model for the site (Figure 18). Figure 19 shows the informational samples in relation to the final verification samples taken after the initial remediation of the west excavation was completed. The informational sample results (Appendix B) indicated some residual contamination present in the rewetted zone in the southwest corner of the excavation (WCH 2010b). Cadmium, chromium, copper, lead, mercury, nickel, zinc, aroclor-1254, and aroclor-1260 were detected in one or more of the information samples in the rewetted zone at concentrations exceeding soil cleanup criteria for protection of groundwater. Polycyclic aromatic hydrocarbons (PAH) were detected, but not at concentrations exceeding criteria for protection of groundwater. On February 4, 2010 a grab sample (J19J60, J19J61) was collected from water present within the west excavation decision unit (WCH 2010a). These sample results are located in Appendix B.

A review of groundwater monitoring data from wells near the waste site did not appear to indicate a release to groundwater associated with waste disposed of at 128-H-1. However, the groundwater had not been monitored for all the contaminants of concern (e.g., lead) that were identified in the contaminated soil within the burn pit area. Therefore, CHPRC updated the groundwater monitoring program for wells near the 128-H-1 waste site (Figure 20) to include these additional contaminants (Appendix D). Table 1 provides a summary of the maximum contaminant concentration detected above the soil cleanup criteria within the rewetted zone soil and the maximum contaminant result of groundwater sampling in nearby wells for these constituents. Additionally, the results of the water grab sample from within the excavation are included in Table 1. Evaluation of nearby groundwater wells indicates that further remediation into the water table is not warranted and that historical waste disposal at the 128-H-1 waste site has not adversely affected groundwater. Groundwater chromium contamination in nearby wells is associated with the 100-HR-3 groundwater plume and historical releases from sodium dichromate waste sites at 100-D/DR and 100-H Areas.

Figure 17. Informational Soil Sample Locations in the Rewetted Zone (September 8, 2009).

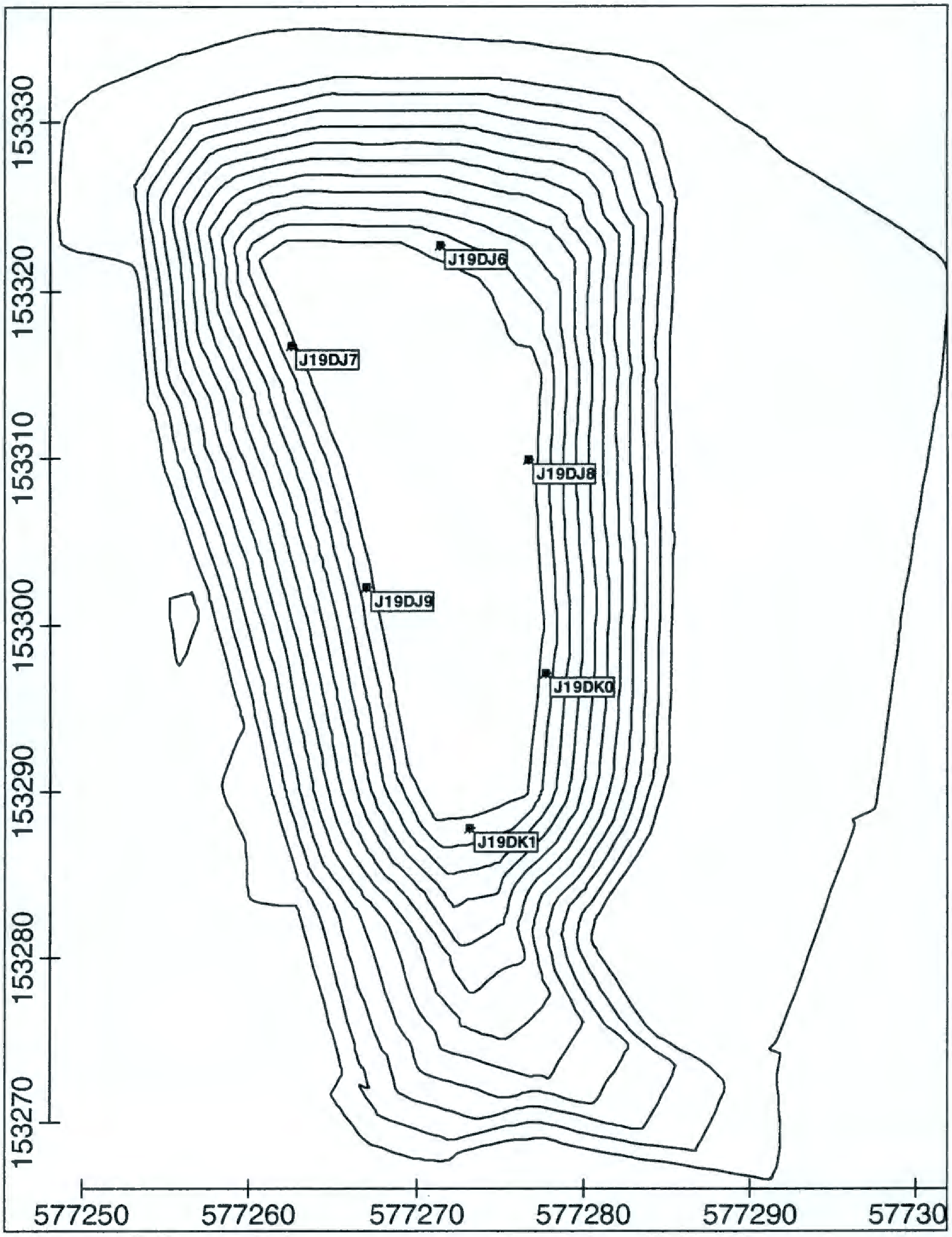


Figure 18. 128-H-1 Conceptual Model.

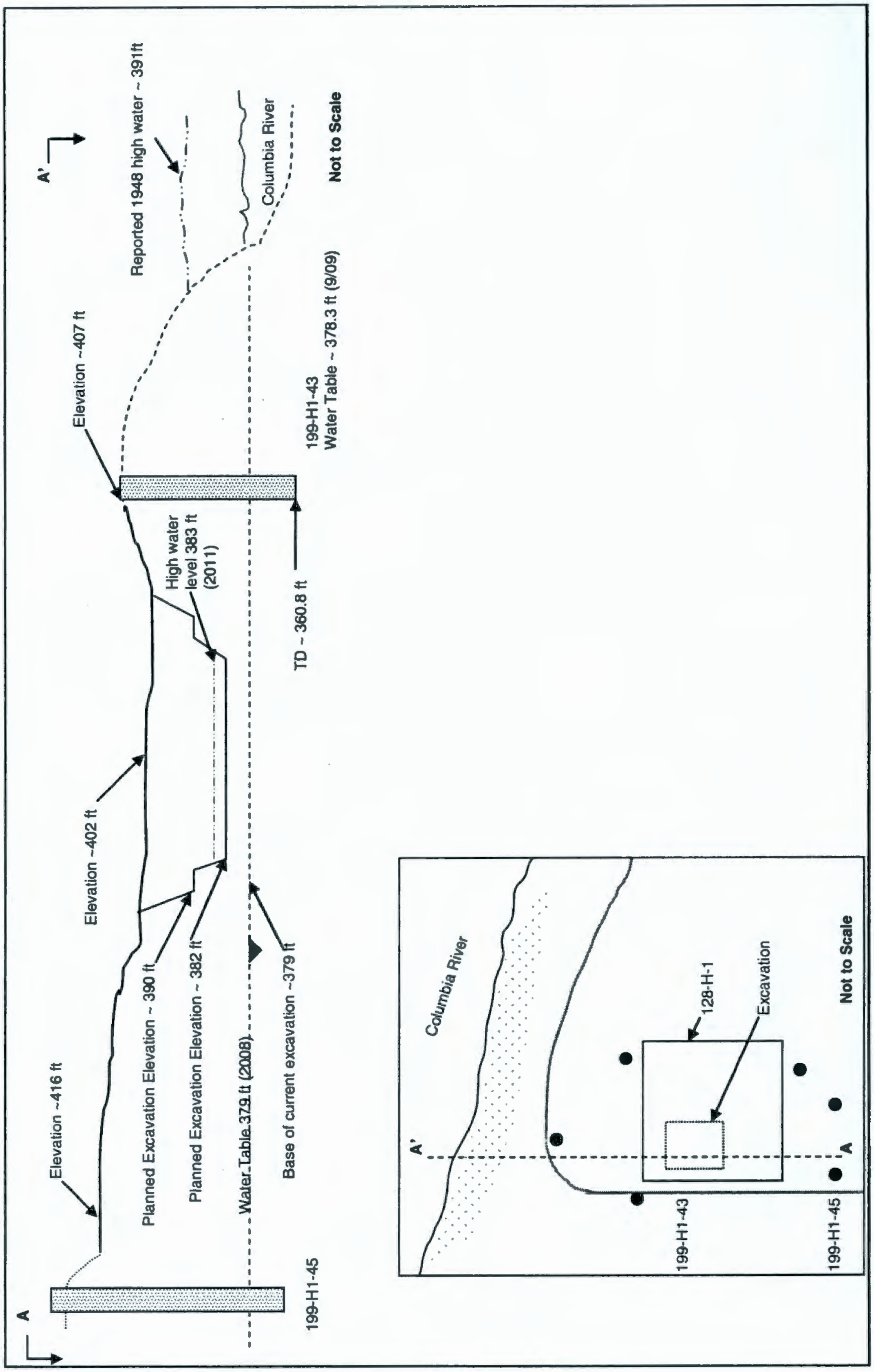


Figure 19. Location of Verification Samples and Informational Samples for the 128-H-1 Waste Site.

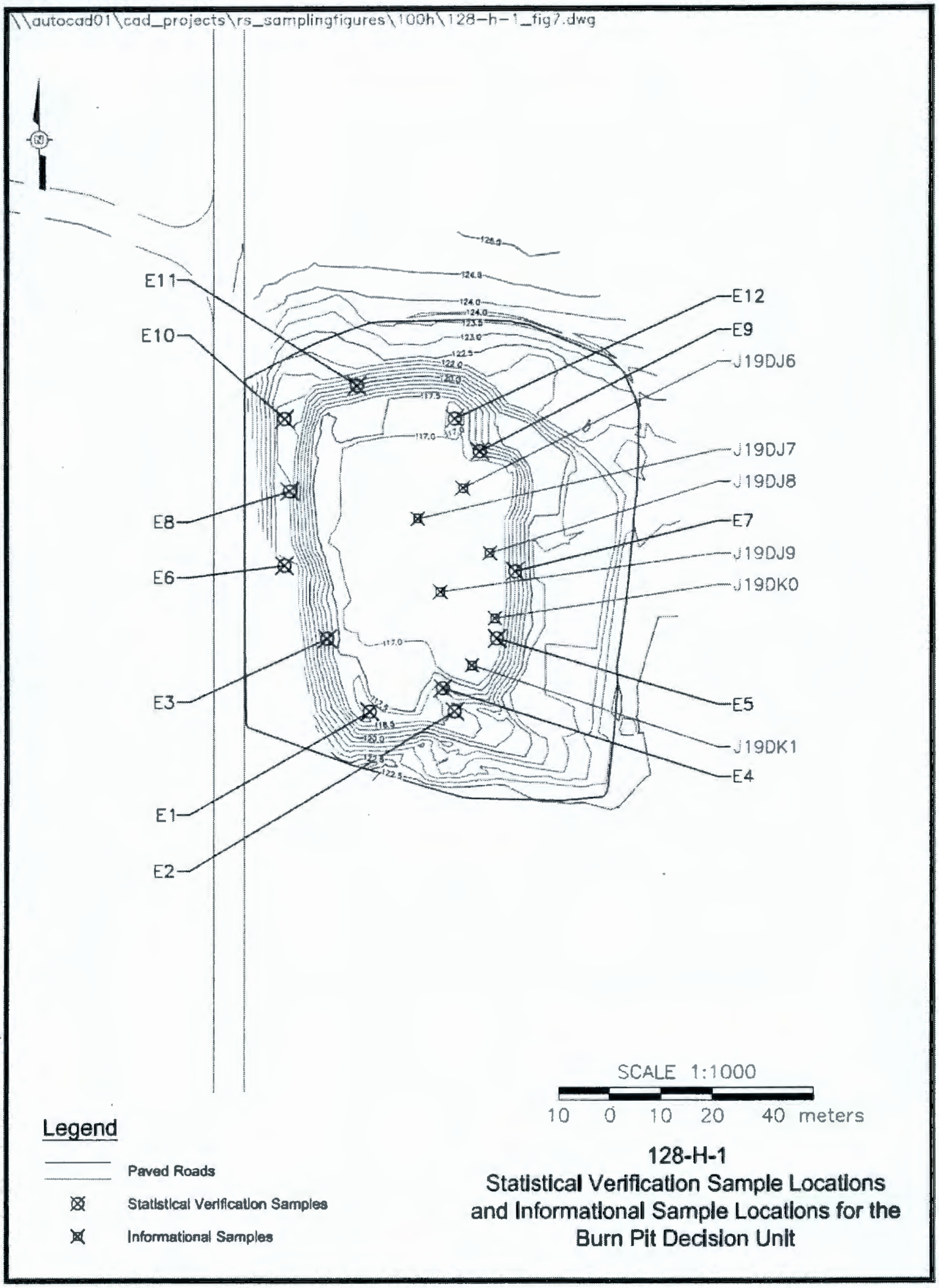


Figure 20. Location of Groundwater Monitoring Wells and Groundwater Flow Direction (2009 Water Table Elevations).

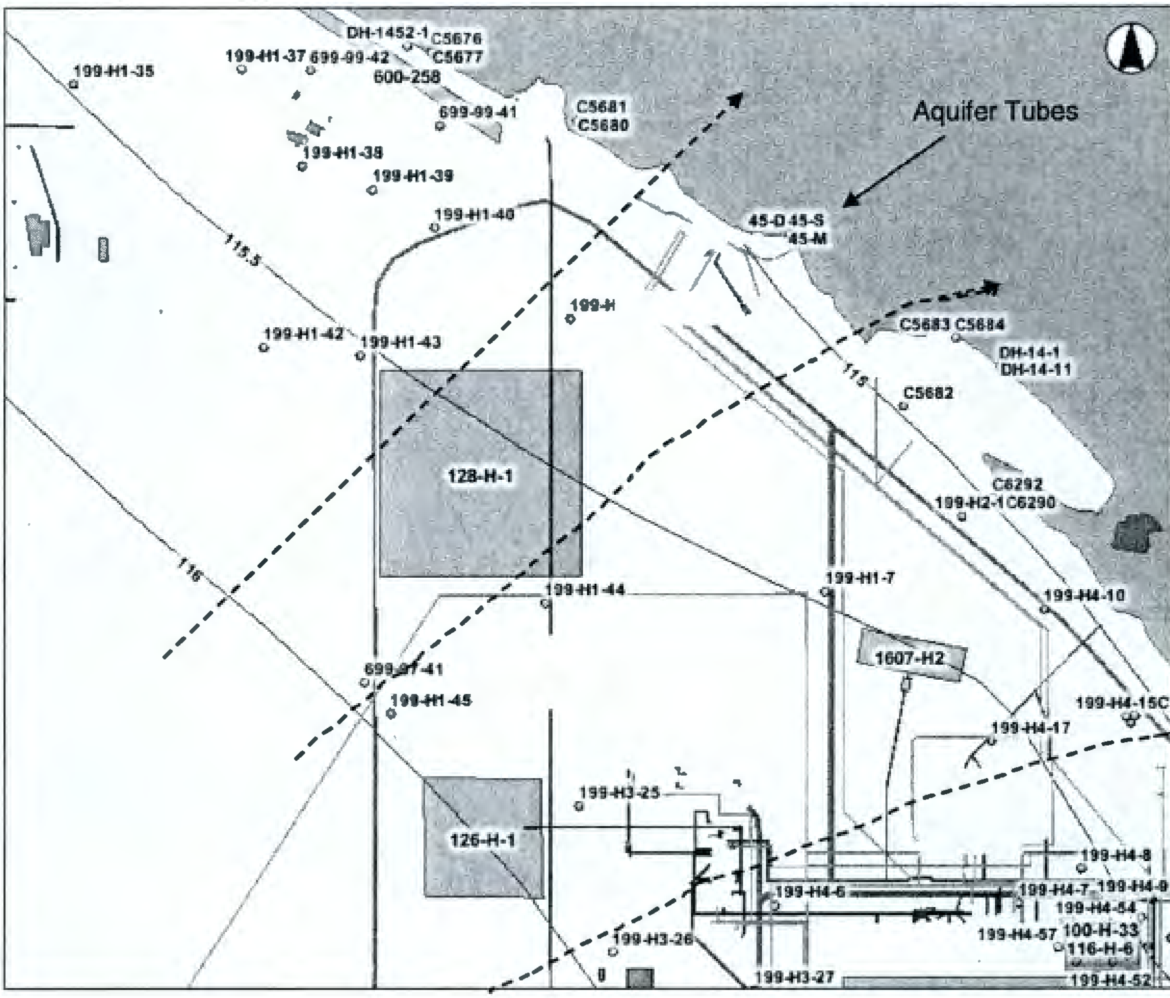


Table 1. Summary of Contaminant Concentrations in Soil and Groundwater. (2 Pages)

Constituent	Informational Soil Concentration (mg/kg)	Soil Cleanup Criteria for Groundwater Protection (mg/kg)	Water Grab Sample Within Excavation (ug/L)	Maximum Groundwater Well Concentration (µg/L)	Groundwater MCL (µg/L)	Calculated Groundwater Cleanup Level (µg/L) [a]
Cadmium	0.818	0.81 [b]	1	4.3	5	8
Chromium	28.1	18.5 [b]	23.8	88.4 [c]	100	24,000 [d]
Copper	142	59.2 [b]	5.29	136	1,000	640
Lead	102	10.2 [b]	10	7.94	15	--
Mercury	0.396	0.33 [b]	0.2	Not detected	2	4.8
Nickel	39.2	19.1 [b]	5	20.3	100	320
Zinc	158	480 [b]	9.67	444	5,000	4,800
Aroclor-1254	0.0407	0.017 [e]	--	Not detected	--	0.0438
Aroclor-1260	0.269	0.017 [e]	--	Not detected	--	0.0438

Table 1. Summary of Contaminant Concentrations in Soil and Groundwater. (2 Pages)

Constituent	Informational Soil Concentration (mg/kg)	Soil Cleanup Criteria for Groundwater Protection (mg/kg)	Water Grab Sample Within Excavation (ug/L)	Maximum Groundwater Well Concentration (µg/L)	Groundwater MCL (µg/L)	Calculated Groundwater Cleanup Level (µg/L) [a]
Total PCBs	0.3097	0.017 [e]	--	Not detected	--	0.0438

[a] Most conservative value of carcinogen or noncarcinogen cleanup level calculated using the appropriate formulas from WAC 173-340-720 (Ecology 1996), with toxicity values updated through April 11, 2007, from the EPA Integrated Risk Information System at http://www.epa.gov/iris or from the Risk Assessment Information System database of the Oak Ridge National Laboratory (ORNL 2009) on the Internet at http://risk.lsd.ornl.gov.

[b] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

[c] Chromium concentration in nearby groundwater wells is associated with releases from sodium dichromate waste sites and the 100-HR-3.

[d] Total chromium value. Hexavalent chromium cleanup level is 48 µg/L.

[e] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not applicable
EPA = U.S. Environmental Protection Agency
MCL = maximum contaminant level
PCB = polychlorinated biphenyl
RDL = required detection limit
WAC = *Washington Administrative Code*

Global Positioning Environmental Radiological Surveyor Survey

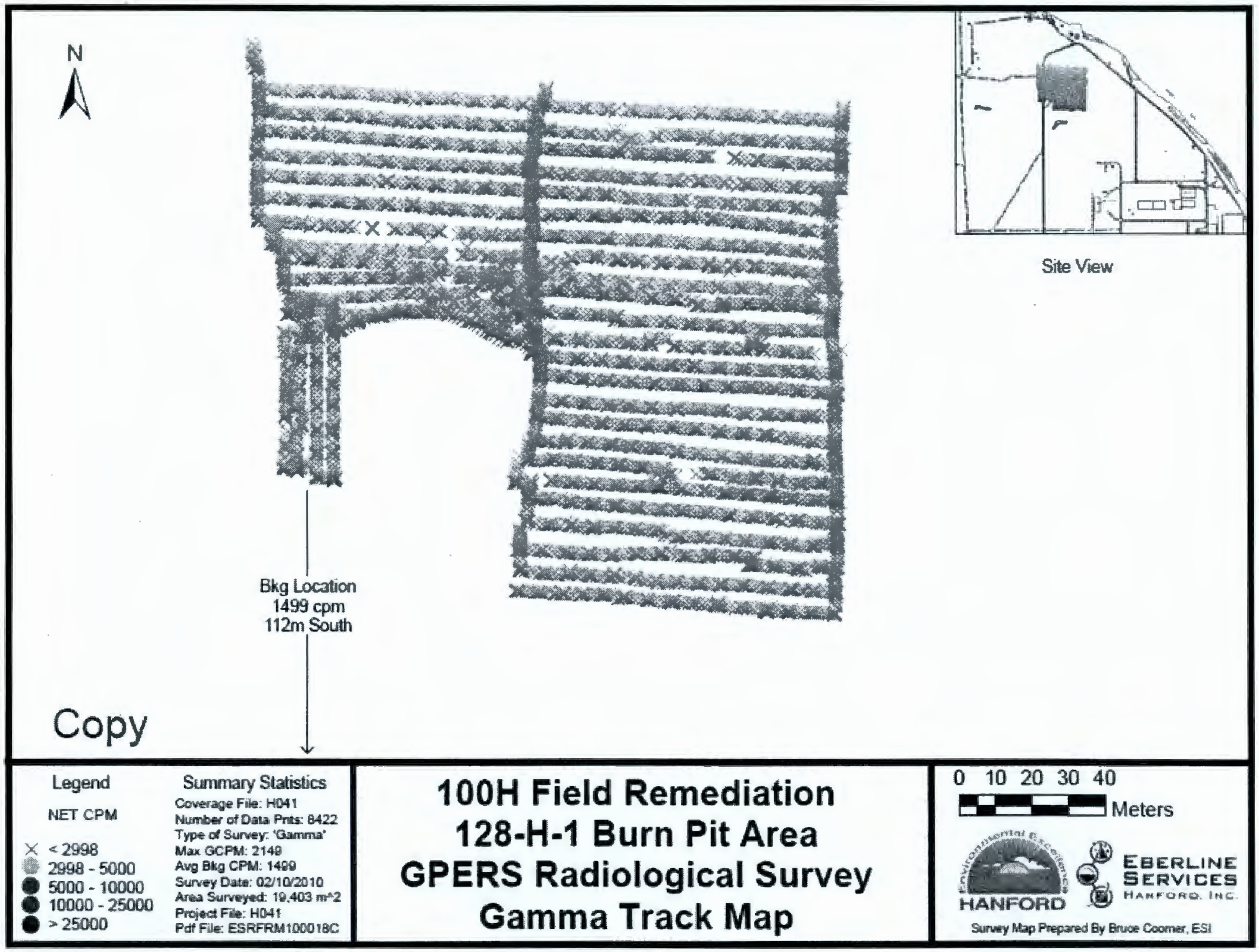
Global Positioning Environmental Radiological Surveyor (GPERS) surveys were conducted on February 10, 16, and 18, 2010. The results of these surveys are provided in Figures 21 through 24 and do not indicate the presence of radiological contamination.

VERIFICATION SAMPLING ACTIVITIES

Initial verification sampling for the 128-H-1 waste site began on June 16, 2010 and was completed on July 1, 2010 (WCH 2010a), to support a determination that residual contaminant concentrations at this site meet the cleanup criteria specified in the RDR/RAWP (DOE-RL 2009b) and the Remaining Sites ROD (EPA 1999). The verification sample results are provided within the 95% upper confidence limit (UCL) calculation in Appendix E and indicate that the remedial action achieved compliance with the RAOs for the 128-H-1 waste site. The following subsections provide additional discussion of the information used to develop the verification sampling design. A more detailed discussion of the verification sample design can be found in the verification work instruction (WCH 2010b).

Additional verification sampling was conducted at the 128-H-1 waste site on May 26, 2011 for the burn pit and the newly constructed stockpile decision units and June 16, 2011 for the surface soil stockpile decision unit after additional remediation of the failed sample locations was completed (WCH 2011).

Figure 21. Radiological Survey of Excavation Footprint.



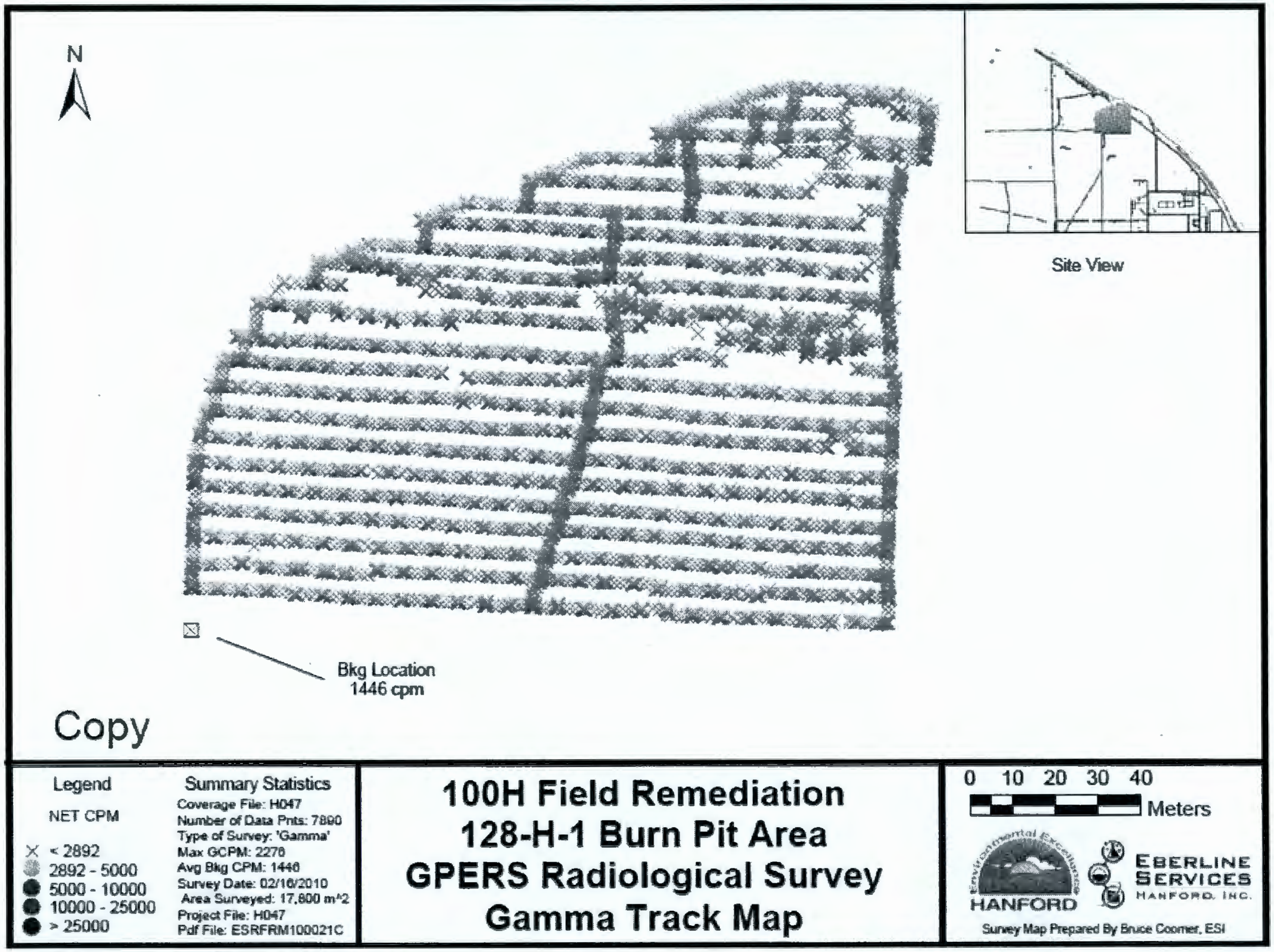


Figure 22. Radiological Survey of Waste Staging Area.

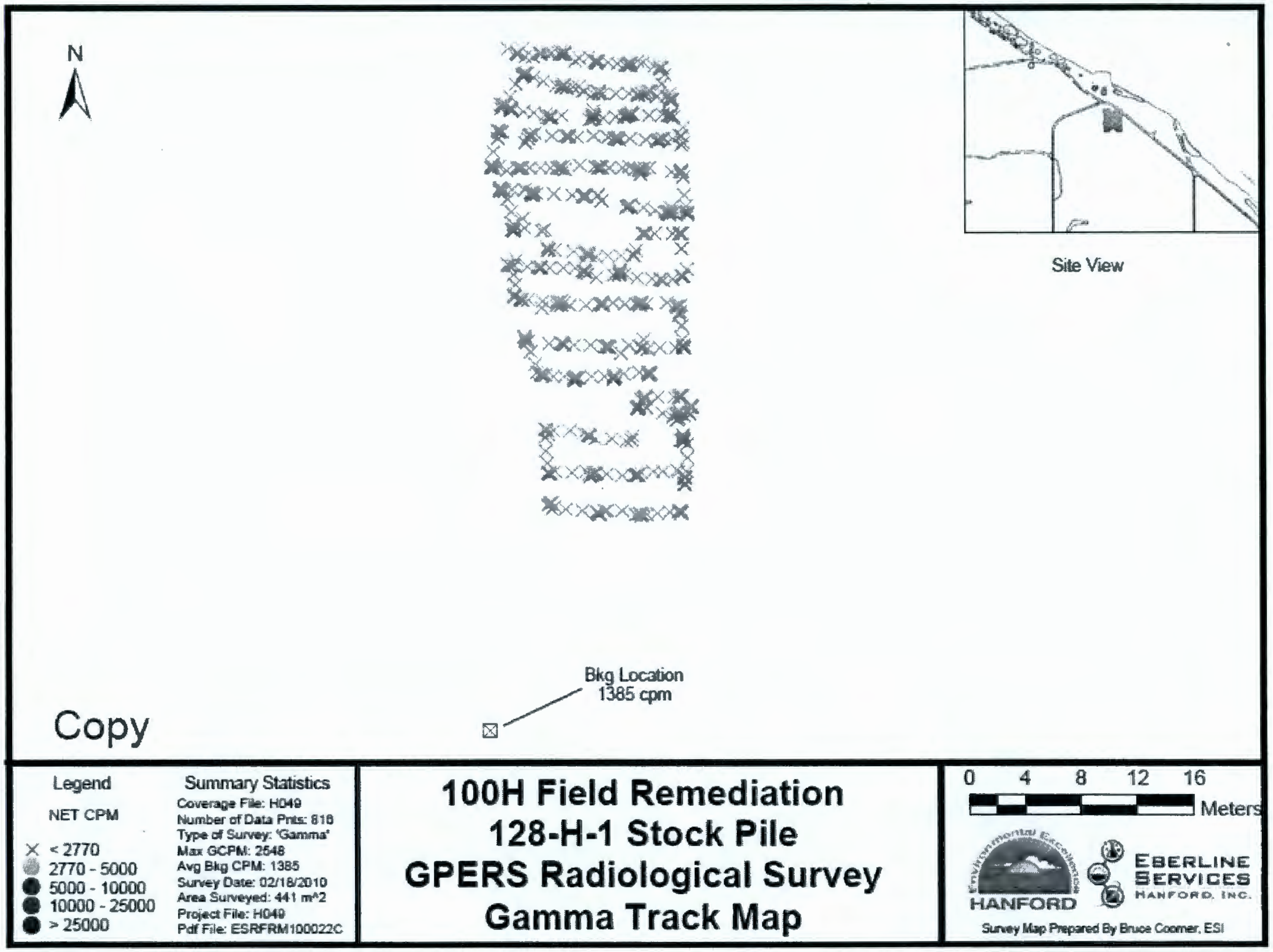


Figure 23. Radiological Survey of Soil Stockpile.

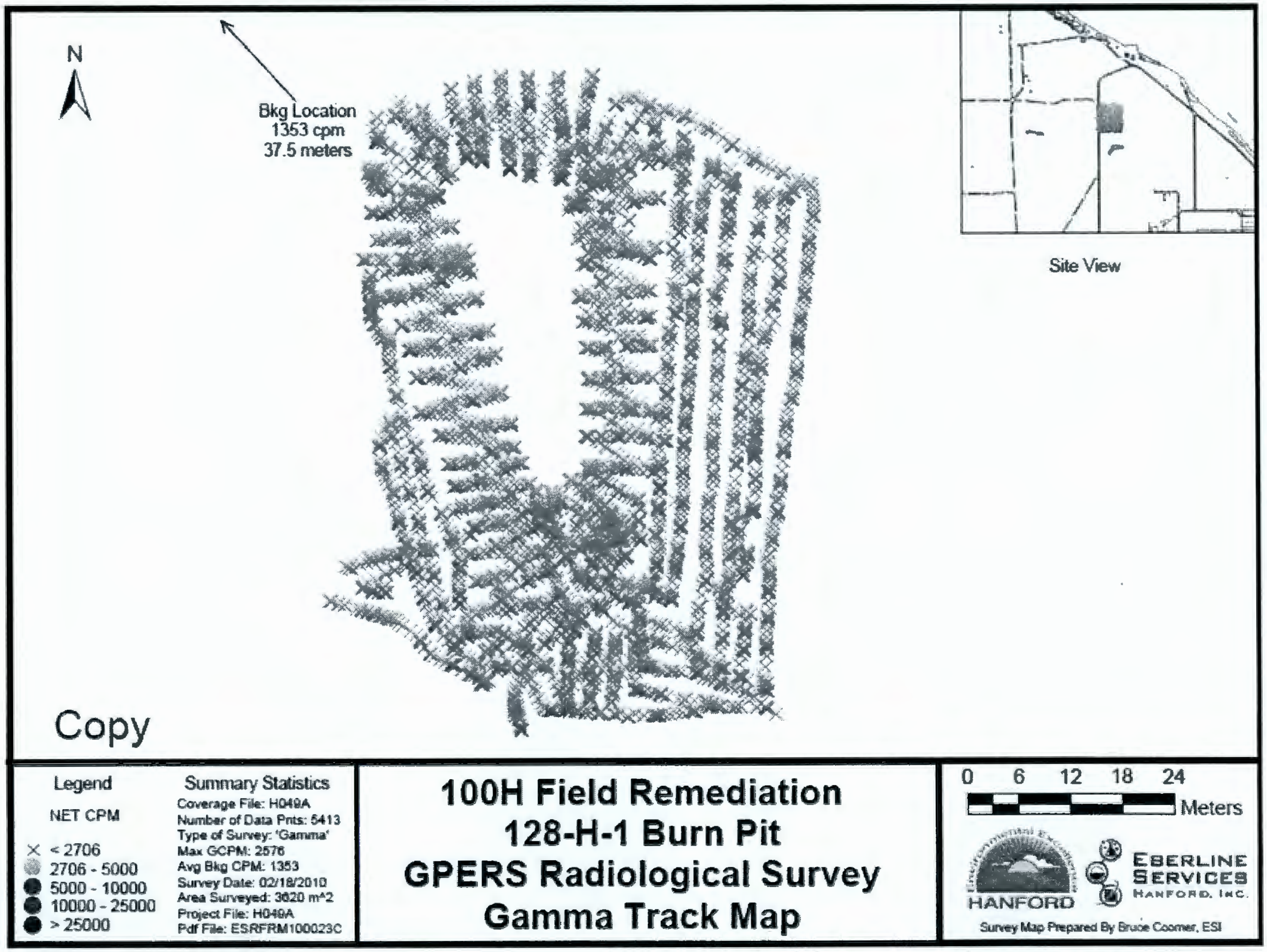


Figure 24. Radiological Survey of Burn Pit Excavation.

Contaminants of Potential Concern

Contaminants of potential concern (COPCs) for the 128-H-1 waste site are identified in the *100 Area Remedial Action Sampling and Analysis Plan* (100 Area SAP) (DOE-RL 2009a). The COPCs include PCBs, pesticides, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), asbestos, antimony, arsenic, barium, cadmium, chromium (total) copper, hexavalent chromium, mercury, lead, manganese, selenium, and silver. Because polycyclic aromatic hydrocarbons (PAH) were detected in the informational samples, they will be included as COPCs. Although not COPCs, beryllium, boron, cobalt, molybdenum, nickel, vanadium, and zinc will be evaluated by performing the expanded inductively coupled plasma (ICP) metals analytical list. Although identified as a COPC in the verification work instruction, lead has been excluded as a COPC in the top 1 m (3 ft) of the stockpile and waste staging area footprint decision units (areas A and B) due to pre-Manhattan Project era orchards in this location per Tri-Party Agreement Change Notice TPA-CN-401 (DOE-RL 2010). Arsenic also has been excluded as a COPC in the top 1 m (3 ft) for these two decision units due to the presence of pre-Manhattan Project era orchards. Based on the chemical composition of the items on these lists, a single list of specific analyses was developed to capture the COPCs for the waste site, as listed in Table 2. The associated laboratory analytical methods are also identified in Table 2.

Table 2. Laboratory Analytical Methods.

Analytical Method	Contaminants of Potential Concern
ICP metals [a] – EPA Method 6010	Antimony, arsenic, barium, cadmium, chromium, copper, lead, manganese, selenium, silver [a]
Hexavalent chromium – EPA Method 7196	Hexavalent chromium
Mercury – EPA Method 7471	Mercury
TPH – NWTPH-Dx [b]	Total petroleum hydrocarbons
PCB – EPA Method 8082	Polychlorinated biphenyls
SVOA – EPA Method 8270	Semivolatile organic compounds
Pesticides – EPA Method 8081	Pesticides
PAH – EPA Method 8310	Polycyclic aromatic hydrocarbons
Bulk asbestos – NIOSH Method 7400	Asbestos

[a] Analysis was performed for the expanded analyte list of ICP metals including antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

[b] NWTPH-Dx analyzes for both diesel and heavy oil range organics.

EPA = U.S. Environmental Protection Agency
ICP = inductively coupled plasma
NIOSH = National Institute for Occupational Safety and Health
NWTPH-Dx = Northwest total petroleum hydrocarbons – diesel range organics
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Verification Sample Design

This section describes the basis for selection of a verification sampling design for the 128-H-1 waste site. The sampling was performed to verify that residual contaminant concentrations did not exceed soil cleanup levels for the protection of human health and the environment as established by the Remaining Sites ROD (EPA 1999).

The decision rule for demonstrating compliance with the cleanup criteria requires comparison of the true population mean, as estimated by the 95% UCL on the sample mean, with the cleanup level. Therefore, a statistical sampling design is the preferred verification sampling approach for the 128-H-1 excavation footprint because the distribution of potential residual soil contamination over the site is uncertain. The Washington State Department of Ecology (Ecology) publication *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) recommends that systematic sampling with sample locations distributed over the entire study area be used. This sampling approach is referred to by Ecology as "area-wide sampling."

The excavated area was delineated in Visual Sample Plan[1] and used as the basis for location of a random-start systematic grid for verification soil sample collection at the site. Twelve statistical soil samples were collected on the grid within the remediation footprint at the site. A triangular grid was used, based on studies that indicate triangular grids are superior to square grids (Gilbert 1987).

The soil sample locations were surveyed and staked prior to sample collection and one discrete sample was collected at each location (WCH 2010b). All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the 100 Area SAP (DOE-RL 2009a). Field quality control samples consisted of one equipment blank sample and five field duplicate sample. All samples were submitted for full protocol laboratory analysis.

After the initial verification samples were analyzed, it was determined that six sample locations (E3, E7, E9, E10, E11, and E12) within the burn pit excavation decision unit and one sample location (A9) within the surface soil stockpile decision unit exceeded the site cleanup criteria. Therefore, additional remediation was conducted on those locations that exceeded RAGs. Due to the large amount of soil that was removed, resampling was conducted using a new sample design with the original COPC list. Two new staging pile areas were constructed for the additional remediation of the burn pit decision unit. These areas were placed over the existing scraped area south of the burn pit (decision unit C) and formed a new decision unit (decision unit F). All areas that required additional remediation were resampled using the original COPC list.

[1] Visual Sample Plan is a site map-based user-interface program that may be downloaded at http://dqo.pnl.gov.

A summary of verification samples collected for the 128-H-1 waste site is provided in Table 3. Table 4 provides a summary of the verification samples collected and laboratory analyses performed for the additional samples taken after remediation of the failed sample areas. A map of the original sample locations are provided in Figures 25 and 26. A map of the burn pit and staging pile footprint sample locations after additional remediation was conducted is provided in Figure 27. Prior to sampling, the groundwater elevation increased causing some samples to be moved to accommodate the elevated groundwater level. Table 4 contains the new locations of the relocated samples and the new sample location map is shown in Figure 28.

Table 3. 128-H-1 Verification Sampling Summary Table. (3 Pages)

Sample Location	HEIS Number	WSP Coordinates		Sample Analysis
		Northing (m)	Easting (m)	
A1	J1B854	153450.8	577397.7	ICP metals [a], hexavalent chromium, mercury, PCBs, TPH, PAH, SVOA, asbestos, pesticides
A2	J1B855	153450.8	577411.8	
A3	J1B856	153462.9	577390.7	
A4	J1B857	153462.9	577404.8	
A5	J1B858	153462.9	577418.8	
A6	J1B859	153475.1	577397.7	
A7	J1B860	153475.1	577411.8	
A8	J1B861	153487.3	577390.7	
A9	J1B862	153487.3	577404.8	
A10	J1B863	153487.3	577418.8	
A11	J1B864	153499.5	577397.7	
A12	J1B865	153499.5	577411.8	
B1	J1B880	153394.0	577229.8	ICP metals [a], hexavalent chromium, mercury, PCBs, TPH, PAH, SVOA, asbestos, pesticides
B2	J1B881	153394.0	577278.7	
B3	J1B882	153394.0	577327.7	
B4	J1B883	153394.0	577376.6	
B6	J1B885	153394.0	577425.6	
B7	J1B886	153436.4	577254.3	
B8	J1B887	153436.4	577303.2	
B9	J1B888	153436.4	577352.2	
B10	J1B889	153436.4	577401.1	
B11	J1B890	153478.8	577278.7	
B12	J1B891	153478.8	577327.7	
B13 [b]	J1B884	153478.8	577376.6	

Table 3. 128-H-1 Verification Sampling Summary Table. (3 Pages)

Sample Location	HEIS Number	WSP Coordinates		Sample Analysis
		Northing (m)	Easting (m)	
C1	J1B893	153193.1	577397.8	
C2	J1B894	153195.7	577301.7	
C3	J1B895	153222.1	577350.5	
C4	J1B896	153224.7	577254.4	
C5	J1B897	153251.1	577303.2	
C6	J1B8B1	153277.6	577351.9	ICP metals [a], hexavalent chromium, mercury, PCBs, TPH, PAH, SVOA, asbestos, pesticides
C7	J1B899	153280.1	577255.8	
C8	J1B8B0	153306.6	577304.6	
C9	J1B898	153333.1	577353.4	
C10	J1B8B2	153359.5	577402.2	
C11	J1B8B3	153335.6	577257.3	
C12	J1B8B4	153362.1	577306.1	
D1	J1B8B6	153226.7	577383.3	
D2	J1B8B7	153226.7	577407.9	
D3	J1B8B8	153248.0	577371.0	
D4	J1B8B9	153248.0	577395.6	
D5	J1B8C0	153269.3	577383.3	
D6	J1B8C1	153269.3	577407.9	ICP metals [a], hexavalent chromium, mercury, PCBs, TPH, PAH, SVOA, asbestos, pesticides
D7	J1B8C2	153290.6	577371.0	
D8	J1B8C3	153290.6	577395.6	
D9	J1B8C4	153311.9	577383.3	
D10	J1B8C5	153311.9	577407.9	
D11	J1B8C6	153333.2	577371.0	
D12	J1B8C7	153333.2	577395.6	
E1	J1B8C9	153273.1	577285.7	
E2	JIB8D0	153276.8	577275.7	
E3	J1B8D1	153280.5	577265.7	
E4	J1B8D2	153294.2	577282.1	
E5	J1B8D3	153291.1	577263.9	
E6	J1B8D4	153304.7	577280.3	ICP metals [a], hexavalent chromium, mercury, PCBs, TPH, PAH, SVOA, asbestos, pesticides
E7	J1B8D5	153301.6	577262.1	
E8	J1B8D6	153315.2	577278.5	
E9	J1B8D7	153312.1	577260.3	
E10	J1B8D8	153325.8	577276.7	
E11	J1B8D9	153322.7	577258.5	
E12	J1B8F0	153329.5	577266.7	

Table 3. 128-H-1 Verification Sampling Summary Table. (3 Pages)

Sample Location	HEIS Number	WSP Coordinates Northing (m)	WSP Coordinates Easting (m)	Sample Analysis
Field duplicate 1	J1B866	153462.9	577390.7	ICP metals [a], hexavalent chromium, mercury, PCBs, PAH, TPH, SVOA, asbestos, pesticides
Field duplicate 2	J1B892	153436.4	577303.2	
Field duplicate 3	J1B8B5	153306.6	577304.6	
Field duplicate 4	J1B8C8	153269.3	577383.3	
Field duplicate 5	J1B8F1	153291.1	577263.9	
Equipment blank	J1B853	NA	NA	ICP metals [a], mercury, SVOA, PCBs, TPH, PAH

[a] Analysis was performed for the expanded analyte list of ICP metals including antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc (arsenic and lead excluded as COPCs for all A and B sample locations).

[b] Extra sample location is due to grid edge effects using Visual Sample Plan.

COPC = contaminant of potential concern
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
WSP = Washington State Plane

Table 4. 128-H-1 Re-Sample Summary Table. (2 Pages)

Sample Location	HEIS Number	WSP Coordinates Northing (m)	WSP Coordinates Easting (m)	Sample Analysis
Stockpile Area				
A9	J1JVX2	153487.3	577404.8	ICP metals [a], hexavalent chromium, mercury, PCBs, TPH, PAH, SVOA, asbestos, pesticides
West Excavation Burn Pit				
E1	J1JCR9	153278.7	577253.1	ICP metals [a], hexavalent chromium, mercury, PCBs, PAH, TPH, SVOA, asbestos, pesticides
E2	J1JCT0	153278.7	577269.8	
E3	J1JCT1	153293.1	577244.8	
E4	J1JCT2	153283.3	577267.5	
E5	J1JCT3	153293.1	577278.1	
E6	J1JCT4	153307.5	577236.5	
E7	J1JCT5	153306.3	577281.7	
E8	J1JCT6	153322.1	577237.5	
E9	J1JCT7	153329.9	577274.7	
E10	J1JCT8	153336.3	577236.5	
E11	J1JCT9	153342.8	577250.6	
E12	J1JCV0	153336.3	577269.8	
Field duplicate	J1JCV1	153307.5	577236.5	

Table 4. 128-H-1 Re-Sample Summary Table. (2 Pages)

Sample Location	HEIS Number	WSP Coordinates		Sample Analysis
		Northing (m)	Easting (m)	
2nd Waste Staging Pile Area				
F1	J1JCV2	153201.0	577255.7	ICP metals [a], hexavalent chromium, mercury, PCBs, PAH, TPH, SVOA, asbestos, pesticides
F2	J1JCV3	153212.4	577249.1	
F3	J1JCV4	153212.4	577262.2	
F4	J1JCV5	153223.8	577255.7	
F5	J1JCV6	153223.8	577268.8	
F6	J1JCV7	153235.2	577249.1	
F7	J1JCV8	153235.2	577262.2	
F8	J1JCV9	153220.4	577281.6	
F9	J1JCW0	153231.8	577275.0	
F10	J1JCW1	153231.8	577288.1	
F11	J1JCW2	153243.2	577281.6	
F12	J1JCW3	153243.2	577294.7	
Field duplicate	J1JCW4	153212.4	577249.1	
Equipment blank	J1JCW5	NA	NA	ICP metals [a], mercury, SVOA, PCBs, TPH, PAH

[a] Analysis was performed for the expanded analyte list of ICP metals including antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc (arsenic and lead excluded as COPCs for all A and B sample locations).

COPC = contaminant of potential concern
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA= semivolatile organic analysis
TPH = total petroleum hydrocarbons
WSP = Washington State Plane

Figure 25. 128-H-1 Statistical Verification Sample Locations – Waste Staging Area Footprint and Soil Stockpile.

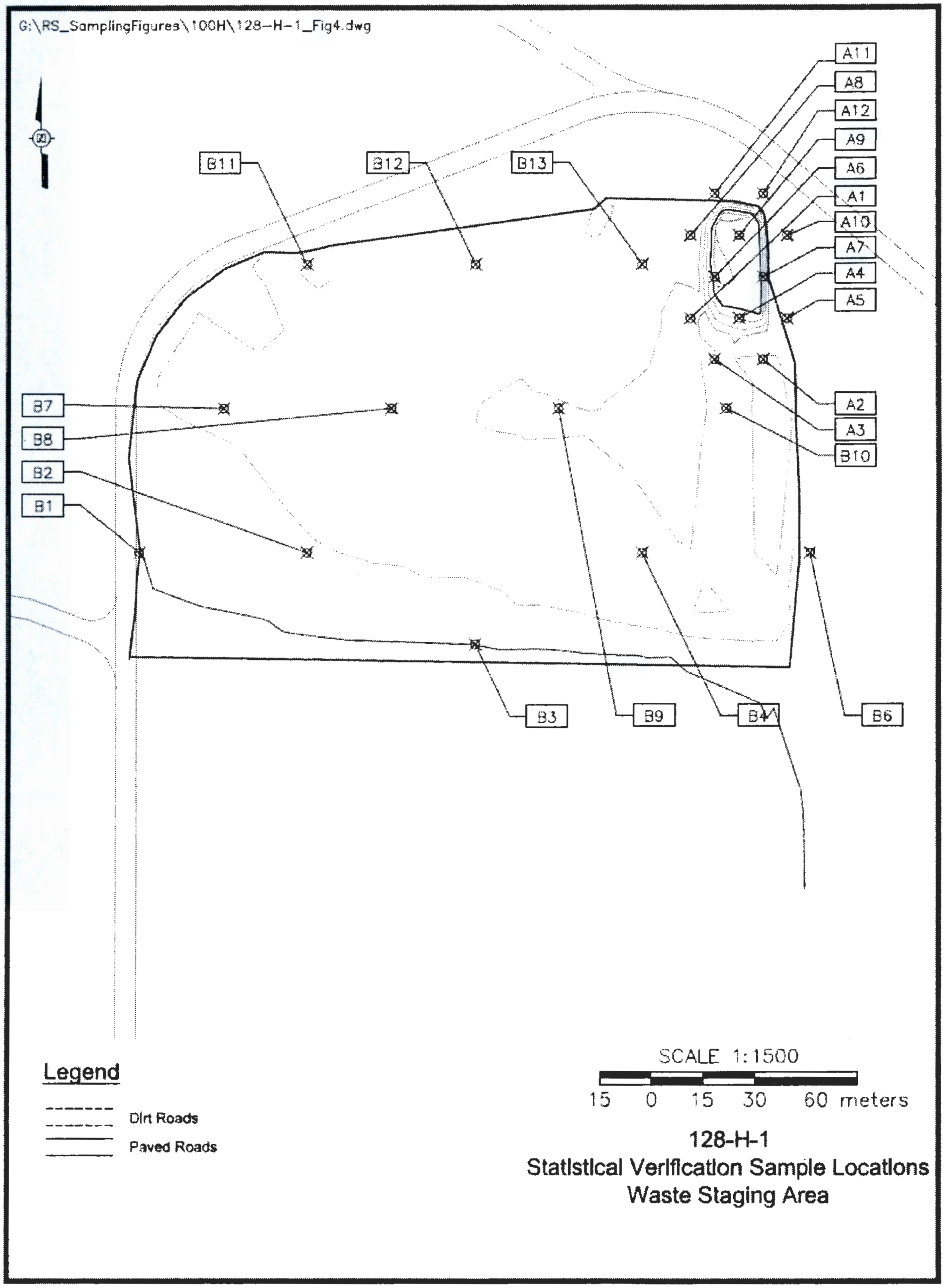


Figure 26. 128-H-1 Statistical Verification Sample Locations – Excavation Areas.

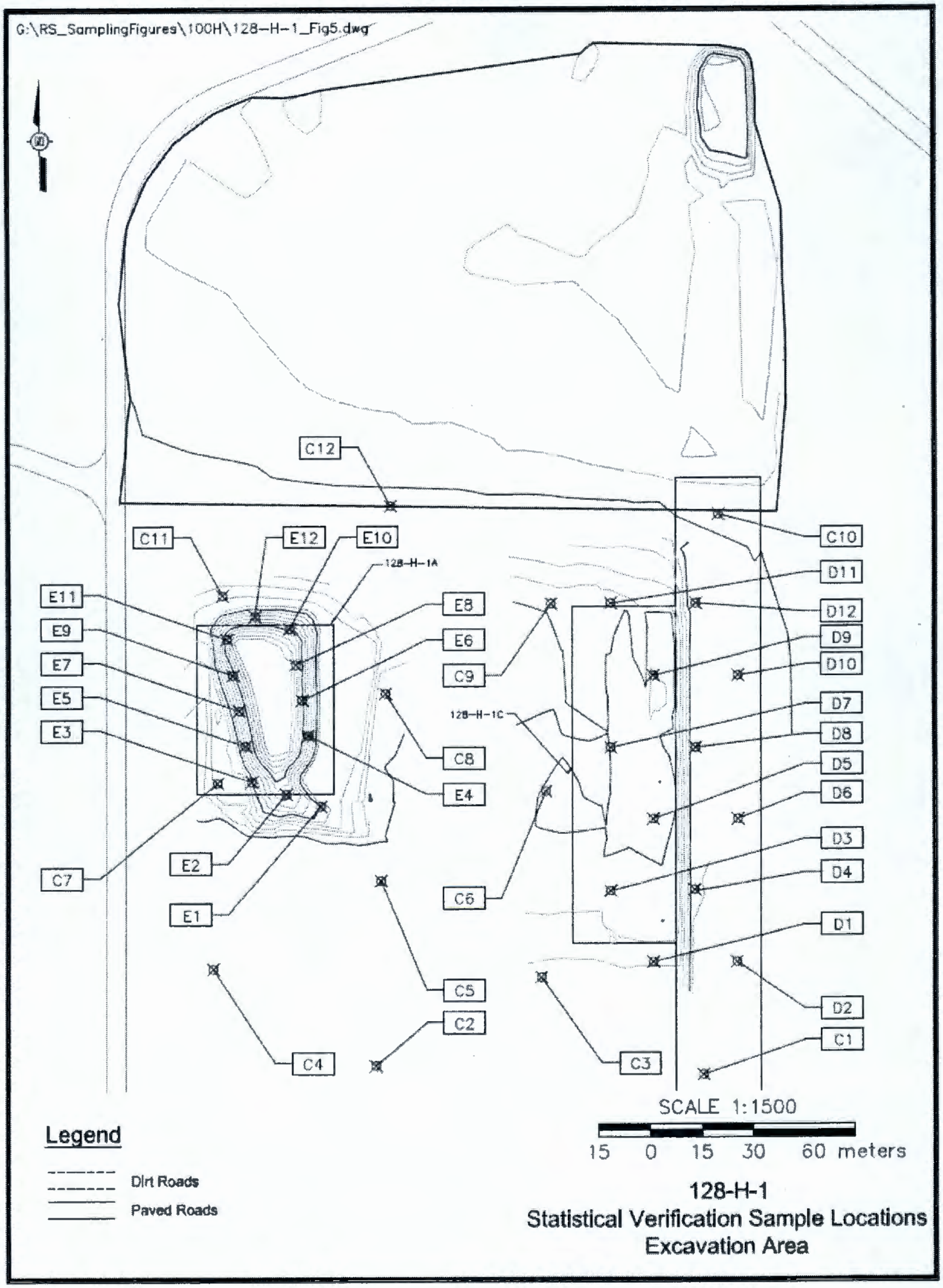


Figure 27. 128-H-1 Statistical Verification Sample Locations – Burn Pit and Staging Pile Footprint After Additional Excavation.

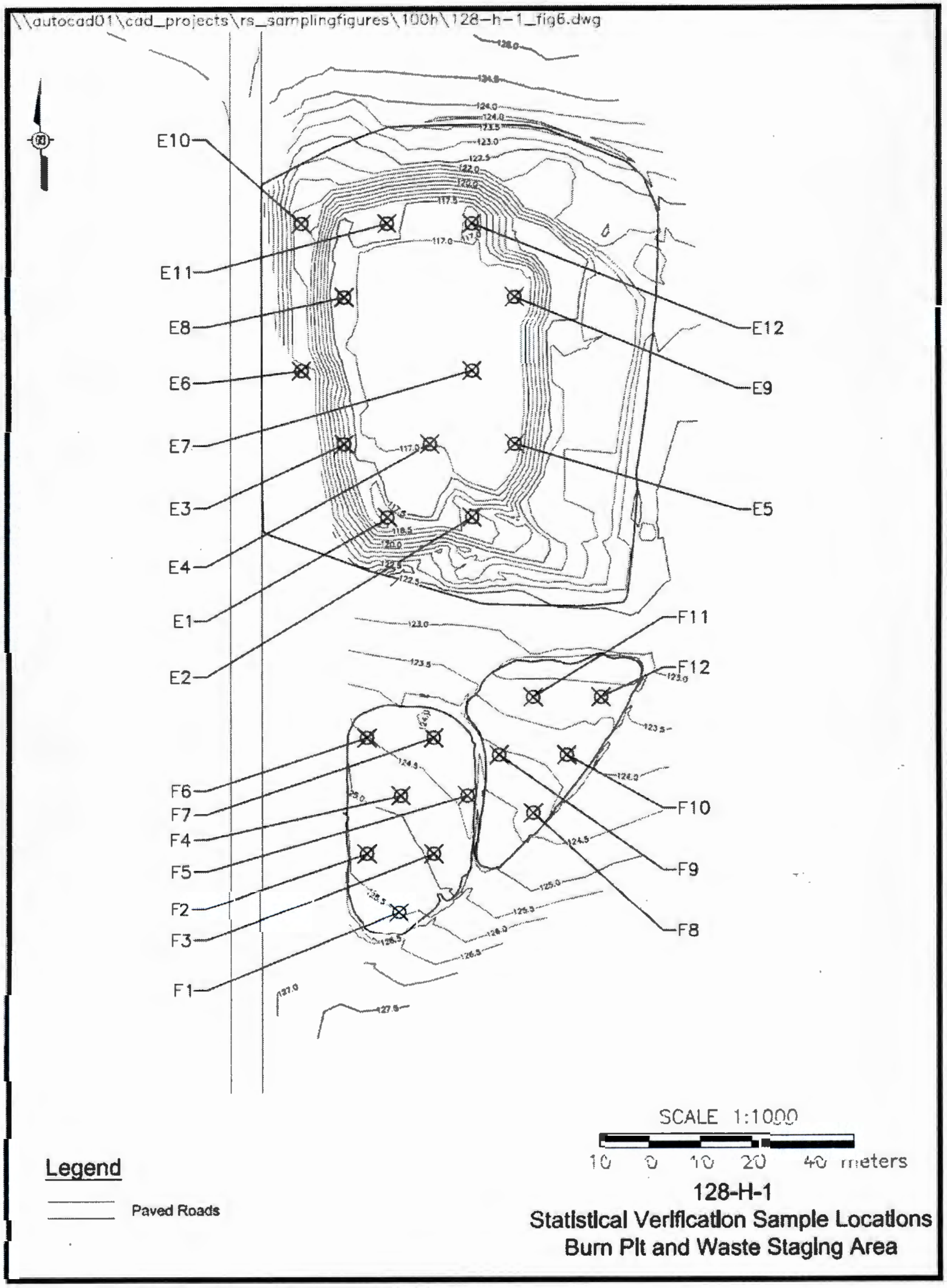
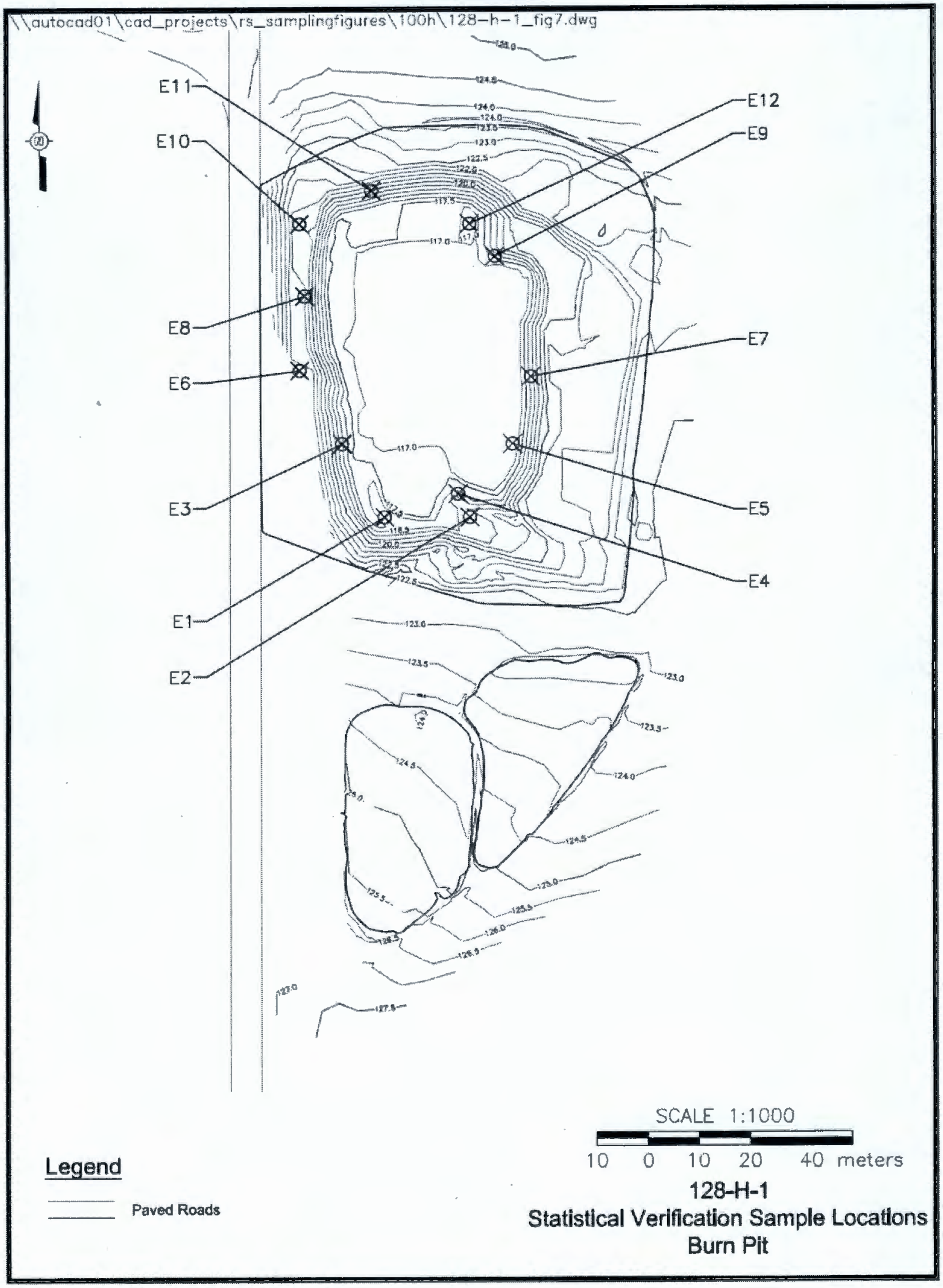


Figure 28. 128-H-1 Statistical Verification Sample Locations – Burn Pit Relocated Samples Following Elevated Groundwater Levels.



Verification Sample Results

The laboratory-reported verification data results for all constituents are stored in the Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and are presented as Attachment 1 of the 95% UCL calculation (Appendix E).

The 128-H-1 waste site consisted of five decision units for verification sampling. These are: (1) the surface soil stockpile that was scraped from the waste staging pile area (area A), (2) the waste staging pile area footprint (area B), (3) the 0.3-m (1-ft) scraped soil area (area C), (4) the east excavation (area D), and (5) the west excavation (area E). Evaluation of the verification data from the excavation footprint was calculated using a 95% UCL on the true population mean for residual concentrations of COPCs, as specified by the RDR/RAWP (DOE-RL 2009b). These calculations are provided in Appendix E. When a COPC was detected in fewer than 50% of the verification samples collected, the maximum detected value was used for comparison against the RAGs. If no detections for a given COPC were reported in the data set, then no statistical evaluation or calculations were performed for that COPC.

Comparisons of the statistical and maximum results for COPCs against the RAGs for the 128-H-1 decision units are summarized in Tables 5 through 10. Contaminants that were not detected by laboratory analysis were excluded from these tables but are reported in Appendix E. Calculated cleanup levels are not presented in the Cleanup Levels and Risk Calculations database (Ecology 2011) under *Washington Administrative Code* (WAC) 173-340-740(3) for, calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COPCs and are also not included in these tables.

VERIFICATION SAMPLE DATA EVALUATION

Evaluation of the results listed in Tables 5 through 10 from the verification sampling at the 128-H-1 waste site indicate that no contaminants exceed direct exposure RAGs. Arsenic is not considered a COPC for the 128-H-1 waste site surface soil stockpile and the original waste staging pile area decision units because these decision units are located in historic orchard areas. Groundwater and/or the Columbia River protection soil RAGs are not exceeded by any contaminant within the west excavation deep zone or the new waste staging pile area decision units. Groundwater and/or the Columbia River protection soil RAGs are exceeded within the surface soil staging area, original waste staging area, excavation scraped soil area, and east excavation area for one or more of the following constituents: lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, or aroclor-1260. Based on RESRAD modeling, discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and aroclor-1260 are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years (based on the contaminant with the lowest distribution coefficient of the contaminants exceeding RAGs, lead, with a distribution coefficient (K_d) value of 30 mL/g.

With the exception of the west excavation area where the excavation extended to the water table, the vadose zone underlying the waste site is approximately 6.0 m (20.0 ft) thick at the deepest portion of the excavation. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River.

Informational rewetted zone samples exceeded the groundwater and river protection RAGs within the west excavation decision unit. However, as results in Table 1 show, these contaminants have not partitioned into the water located within the excavation at concentrations exceeding the MCLs.

Table 5. Comparison of Statistical Values to Action Levels for the 128-H-1 Surface Soil Stockpile Verification Samples. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Arsenic	45.0	20 [c]	20 [c]	20 [c]	Yes [d]	--
Barium	84.7 (<BG)	5,600	200	400	No	--
Beryllium	0.277 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Boron [f]	2.83	7,200	320	-- [g]	No	--
Cadmium [h]	0.179 (<BG)	13.9 [e]	0.81 [c]	0.81 [c]	No	--
Chromium, total	13.1 (<BG)	80,000	18.5 [c]	18.5 [c]	No	--
Cobalt	6.55 (<BG)	24	15.7 [c]	-- [g]	No	--
Copper	13.4 (<BG)	2,960	59.2	22.0 [c]	No	--
Lead	304	353	10.2 [c]	10.2 [c]	Yes	Yes [i]
Manganese	314 (<BG)	3,760	512 [c]	512 [c]	No	--
Mercury	0.02 (<BG)	24	0.33 [c]	0.33 [c]	No	--
Molybdenum [f]	0.392	400	8	-- [g]	No	--
Nickel	11.0 (<BG)	1,600	19.1 [c]	27.4	No	--
Vanadium	47.2 (<BG)	560	85.1 [c]	-- [g]	No	--
Zinc	49.5 (<BG)	24,000	480	67.8 [c]	No	--
TPH – diesel range	8.4	200	200	200	No	--
TPH – motor oil	42.894	200	200	200	No	--
TPH – diesel range EXT	24.0	200	200	200	No	--
Acenaphthene	0.0109	4,800	96	129	No	--
Acenaphthylene [j]	0.00365	4,800	96	129	No	--
Anthracene	0.00297	24,000	240	1,920	No	--
Benzo(a)anthracene	0.0553	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(a)pyrene	0.0563	0.137	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(b)fluoranthene	0.0381	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(ghi)perylene	0.0371	2,400	48	192	No	--
Benzo(k)fluoranthene	0.019	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Chrysene	0.0652	13.7	0.12	0.1 [k]	No	--
Dibenz(a,h)anthracene	0.00628	1.37	0.03 [k]	0.03 [k]	No	--
Fluoranthene	0.096	3,200	64	18.0	No	--
Fluorene	0.00287	3,200	64	260	No	--

Table 5. Comparison of Statistical Values to Action Levels for the 128-H-1 Surface Soil Stockpile Verification Samples. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Indeno(1,2,3-cd)pyrene	0.0378	1.37	0.33 [k]	0.33 [k]	No	--
Naphthalene	0.00548	1,600	16.0	988	No	--
Phenanthrene [j]	0.0598	24,000	240	1,920	No	--
Pyrene	0.187	2,400	48	192	No	--
Endosulfan I	0.00129	480	9.6	0.0112	No	--
4,4'-DDE	0.00029	2.94	0.0257	0.0033 [k]	No	--
Aroclor-1254	0.00805	0.5	0.017 [k]	0.017 [k]	No	--
Bis(2-ethylhexyl)phthalate	0.144	71.4	0.6	0.36	No	--

[a] RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.

[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).

[d] Due to historical orchards present in this area and residual concentrations of arsenic exceeding RAGs not extending below 1 m (3 ft) below ground surface, arsenic is excluded as a COPC for the 128-H-1 waste site staging pile area per Tri-Party Agreement Change Notice TPA-CN-401 (DOE-RL 2010).

[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[f] No Hanford Site-specific or Washington State background value is available.

[g] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[h] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[i] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient, lead, with a distribution coefficient value of 30 mL/g. The distance to groundwater from the bottom of the stockpile area is 6.0 m (20.0 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: acenapthylene; surrogate: acenapthene
contaminant: phenathrene; surrogate: anthracene.

[k] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 6. Comparison of Statistical Values to Action Levels for the 128-H-1 Original Waste Staging Area Footprint Verification Samples. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Arsenic	65.3	20 [c]	20 [c]	20 [c]	Yes [d]	--
Barium	88.2 (<BG)	5,600	200	400	No	--
Beryllium	0.339 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Boron [f]	3.25	7,200	320	-- [g]	No	--
Cadmium [h]	0.151 (<BG)	13.9 [e]	0.81 [c]	0.81 [c]	No	--
Chromium, total	15.1 (<BG)	80,000	18.5 [c]	18.5 [c]	No	--
Cobalt	6.81 (<BG)	24	15.7 [c]	-- [g]	No	--
Copper	13.2 (<BG)	2,960	59.2	22.0 [c]	No	--
Lead	207	353	10.2 [c]	10.2 [c]	Yes	Yes [i]
Manganese	340 (<BG)	3,760	512 [c]	512 [c]	No	--
Mercury	0.082 (<BG)	24	0.33 [c]	0.33 [c]	No	--
Molybdenum [f]	0.272	400	8	-- [g]	No	--
Nickel	12.0 (<BG)	1,600	19.1 [c]	27.4	No	--
Vanadium	46.7 (<BG)	560	85.1 [c]	-- [g]	No	--
Zinc	43.4 (<BG)	24,000	480	67.8 [c]	No	--
TPH – motor oil	21.073	200	200	200	No	--
Acenaphthene	0.0443	4,800	96	129	No	--
Acenaphthylene [j]	0.00158	4,800	96	129	No	--
Anthracene	0.00283	24,000	240	1,920	No	--
Benzo(a)anthracene	0.0181	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(a)pyrene	0.0274	0.137	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(b)fluoranthene	0.0226	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(ghi)perylene	0.0205	2,400	48	192	No	--
Benzo(k)fluoranthene	0.00824	1.37	0.015 [k]	0.015 [k]	No	--
Chrysene	0.0177	13.7	0.12	0.1 [k]	No	--
Dibenz(a,h)anthracene	0.00255	1.37	0.03 [k]	0.03 [k]	No	--
Fluoranthene	0.0794	3,200	64	18.0	No	--
Fluorene	0.0118	3,200	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.0222	1.37	0.33 [k]	0.33 [k]	No	--
Phenanthrene [j]	0.0242	24,000	240	1,920	No	--
Pyrene	0.0729	2,400	48	192	No	--
Aroclor-1254	0.00875	0.5	0.017 [k]	0.017 [k]	No	--

Table 6. Comparison of Statistical Values to Action Levels for the 128-H-1 Original Waste Staging Area Footprint Verification Samples. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Aroclor-1260	0.00373	0.5	0.017 [k]	0.017 [k]	No	--
Total PCBs	0.0125	0.5	0.017 [k]	0.017 [k]	No	--

[a] RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.

[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).

[d] Due to historical orchards present in this area and residual concentrations of arsenic exceeding RAGs not extending below 1 m (3 ft) below ground surface, arsenic is excluded as a COPC for the 128-H-1 waste site staging pile area footprint per Tri-Party Agreement Change Notice TPA-CN-401 (DOE-RL 2010).

[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[f] No Hanford Site-specific or Washington State background value is available.

[g] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[h] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[i] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient, lead, with a distribution coefficient value of 30 mL/g. The distance to groundwater from the bottom of the original waste staging pile area is 6.0 m (20.0 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: acenapthylene; surrogate: acenapthene
contaminant: phenathrene; surrogate: anthracene.

[k] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
PCB = polychlorinated biphenyl
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 7. Comparison of Statistical Values to Action Levels for the 128-H-1 Excavation Scraped Surface Area. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Antimony [c]	0.239 (<BG)	32	5 [d]	5 [d]	No	--
Arsenic	11.7	20 [d]	20 [d]	20 [d]	No	--
Barium	106 (<BG)	5,600	200	400	No	--
Beryllium	0.297 (<BG)	10.4 [e]	1.51 [d]	1.51 [d]	No	--
Boron [f]	5.07	7,200	320	-- [g]	No	--
Cadmium [c]	0.153 (<BG)	13.9 [e]	0.81 [d]	0.81 [d]	No	--
Chromium, total	13.6 (<BG)	80,000	18.5 [d]	18.5 [d]	No	--
Cobalt	6.76 (<BG)	24	15.7 [d]	-- [g]	No	--
Copper	13.9 (<BG)	2,960	59.2	22.0 [d]	No	--
Lead	93.3	353	10.2 [d]	10.2 [d]	Yes	Yes [h]
Hexavalent chromium [f]	0.16	2.1 [e]	4.8	2	No	--
Manganese	299 (<BG)	3,760	512 [d]	512 [d]	No	--
Mercury	0.030 (<BG)	24	0.33 [d]	0.33 [d]	No	--
Molybdenum [f]	0.350	400	8	-- [g]	No	--
Nickel	12.8 (<BG)	1,600	19.1 [d]	27.4	No	--
Vanadium	46.3 (<BG)	560	85.1 [d]	-- [g]	No	--
Zinc	43.9 (<BG)	24,000	480	67.8 [d]	No	--
TPH – diesel range	9.3	200	200	200	No	--
TPH – motor oil	25.289	200	200	200	No	--
Acenaphthene	0.0682	4,800	96	129	No	--
Acenaphthylene [i]	0.0554	4,800	96	129	No	--
Anthracene	0.00354	24,000	240	1,920	No	--
Benzo(a)anthracene	0.0387	1.37	0.015 [j]	0.015 [j]	Yes	Yes [h]
Benzo(a)pyrene	0.0491	0.137	0.015 [j]	0.015 [j]	Yes	Yes [h]
Benzo(b)fluoranthene	0.0524	1.37	0.015 [j]	0.015 [j]	Yes	Yes [h]
Benzo(ghi)perylene	0.0421	2,400	48	192	No	--
Benzo(k)fluoranthene	0.0235	1.37	0.015 [j]	0.015 [j]	Yes	Yes [h]
Chrysene	0.035	13.7	0.12	0.1 [j]	No	--
Dibenz(a,h)anthracene	0.0186	1.37	0.03 [j]	0.03 [j]	No	--
Fluoranthene	0.561	3,200	64	18.0	No	--
Fluorene	0.00430	3,200	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.0343	1.37	0.33 [j]	0.33 [j]	No	--
Phenanthrene [i]	0.0175	24,000	240	1,920	No	--
Pyrene	0.084	2,400	48	192	No	--
4,4'-DDE	0.0029	2.94	0.0257	0.0033 [j]	No	--

Table 7. Comparison of Statistical Values to Action Levels for the 128-H-1 Excavation Scraped Surface Area. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Aroclor-1260	0.0034	0.5	0.017 [j]	0.017 [j]	No	--

[a] RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted.
[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.
[c] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[d] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).
[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[f] No Hanford Site-specific or Washington State background value is available.
[g] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).
[h] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient, lead, with a distribution coefficient value of 30 mL/g. The distance to groundwater from the bottom of the excavation scraped surface area is 6.0 m (20.0 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.
[i] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: acenapthylene; surrogate: acenapthene
contaminant: phenathrene; surrogate: anthracene.
[j] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 8. Comparison of Statistical Values to Action Levels for the 128-H-1 East Excavation Verification Samples. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Arsenic	5.18 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	97.1 (<BG)	5,600	200	400	No	--
Beryllium	0.312 (<BG)	10.4 [d]	1.51 [c]	1.51 [c]	No	--
Boron [e]	4.63	7,200	320	-- [f]	No	--
Cadmium [g]	0.161 (<BG)	13.9 [d]	0.81 [c]	0.81 [c]	No	--
Chromium, total	14.4 (<BG)	80,000	18.5 [c]	18.5 [c]	No	--
Cobalt	6.79 (<BG)	24	15.7 [c]	-- [f]	No	--
Copper	13.8 (<BG)	2,960	59.2	22.0 [c]	No	--
Hexavalent chromium [e]	0.15	2.1 [d]	4.8	2	No	--
Lead	27.6	353	10.2 [c]	10.2 [c]	Yes	Yes [h]
Manganese	321 (<BG)	3,760	512 [c]	512 [c]	No	--
Mercury	0.25 (<BG)	24	0.33 [c]	0.33 [c]	No	--
Molybdenum [e]	0.42	400	8	-- [f]	No	--
Nickel	11.6 (<BG)	1,600	19.1 [c]	27.4	No	--
Vanadium	51.5 (<BG)	560	85.1 [c]	-- [f]	No	--
Zinc	40.7 (<BG)	24,000	480	67.8 [c]	No	--
TPH – diesel range	28.8	200	200	200	No	--
TPH – motor oil	22.992	200	200	200	No	--
Acenaphthene	0.0127	4,800	96	129	No	--
Acenaphthylene [i]	0.0662	4,800	96	129	No	--
Anthracene	0.00131	24,000	240	1,920	No	--
Benzo(a)anthracene	0.00916	1.37	0.015 [j]	0.015 [j]	No	--
Benzo(a)pyrene	0.00877	0.137	0.015 [j]	0.015 [j]	No	--
Benzo(b)fluoranthene	0.00991	1.37	0.015 [j]	0.015 [j]	No	--
Benzo(ghi)perylene	0.00611	2,400	48	192	No	--
Benzo(k)fluoranthene	0.00388	1.37	0.015 [j]	0.015 [j]	No	--
Chrysene	0.0179	13.7	0.12	0.1 [j]	No	--
Dibenz(a,h)anthracene	0.00259	1.37	0.03 [j]	0.03 [j]	No	--
Fluoranthene	0.0268	3,200	64	18.0	No	--
Fluorene	0.00427	3,200	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.00514	1.37	0.33 [j]	0.33 [j]	No	--
Naphthalene	0.00657	1,600	16.0	988	No	--
Phenanthrene [i]	0.0102	24,000	240	1,920	No	--
Pyrene	0.0171	2,400	48	192	No	--
4,4'-DDE	0.00246	2.94	0.0257	0.0033 [j]	No	--
Aroclor-1254	0.00943	0.5	0.017 [j]	0.017 [j]	No	--

Table 8. Comparison of Statistical Values to Action Levels for the 128-H-1 East Excavation Verification Samples. (2 Pages)

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Aroclor-1260	0.0192	0.5	0.017 [j]	0.017 [j]	Yes	Yes [h]
Total PCBs	0.0286	0.5	0.017 [j]	0.017 [j]	Yes	Yes [h]

[a] RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.

[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).

[d] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[e] No Hanford Site-specific or Washington State background value is available.

[f] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[g] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[h] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead and aroclor-1260 are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient, lead, with a distribution coefficient value of 30 mL/g. The distance to groundwater from the bottom of the east excavation area is 6.0 m (20.0 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

[i] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: acenapthylene; surrogate: acenapthene
contaminant: phenathrene; surrogate: anthracene.

[j] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
PCB = polychlorinated biphenyl
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 9. Comparison of Statistical Values to Action Levels for the 128-H-1 West Excavation Verification Samples.

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Arsenic	4.0 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	67.1 (<BG)	5,600	200	400	No	--
Beryllium	0.17 (<BG)	10.4 [d]	1.51 [c]	1.51 [c]	No	--
Boron [e]	1.3	7,200	320	-- [f]	No	--
Cadmium [g]	0.082 (<BG)	13.9 [d]	0.81[c]	0.81[c]	No	--
Chromium, total	12.7 (<BG)	80,000	18.5 [c]	18.5 [c]	No	--
Cobalt	6.5 (<BG)	24	15.7 [c]	-- [f]	No	--
Copper	16.7 (<BG)	2,960	59.2	22.0[c]	No	--
Hexavalent chromium [e]	0.917	2.1 [d]	4.8	2	No	--
Lead	6.9 (<BG)	353	10.2 [c]	10.2 [c]	No	--
Manganese	271 (<BG)	3,760	512 [c]	512 [c]	No	--
Mercury	0.013 (<BG)	24	0.33 [c]	0.33 [c]	No	--
Molybdenum [e]	0.49	400	8	-- [f]	No	--
Nickel	11.5 (<BG)	1,600	19.1[c]	27.4	No	--
Vanadium	40.8 (<BG)	560	85.1 [c]	-- [f]	No	--
Zinc	36.2 (<BG)	24,000	480	67.8 [c]	No	--
TPH – diesel range	160.0	200	200	200	No	--
TPH – motor oil	85.416	200	200	200	No	--
Benzo(a)anthracene	0.012	1.37	0.015 [h]	0.015 [h]	No	--
Benzo(b)fluoranthene	0.013	1.37	0.015 [h]	0.015 [h]	No	--
Chrysene	0.015	13.7	0.12	0.1 [h]	No	--
Fluoranthene	0.023	3,200	64	18.0	No	--
Pyrene	0.03	2,400	48	192	No	--
Bis(2-ethylhexyl)phthalate	0.0742	71.4	0.6	0.36	No	--

[a] RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.

[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).

[d] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[e] No Hanford Site-specific or Washington State background value is available.

[f] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[g] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[h] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 10. Comparison of Statistical Values to Action Levels for the 128-H-1 New Waste Staging Pile Area Verification Samples.

COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a]			Does the Maximum Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Levels Protective of Groundwater	Soil Levels Protective of the River		
Arsenic	3.7 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	90.6 (<BG)	5,600	200	400	No	--
Beryllium	0.27 (<BG)	10.4 [d]	1.51 [c]	1.51 [c]	No	--
Boron [e]	1.7	7,200	320	-- [f]	No	--
Cadmium [g]	0.092 (<BG)	13.9 [d]	0.81[c]	0.81[c]	No	--
Chromium, total	14.1 (<BG)	80,000	18.5 [c]	18.5 [c]	No	--
Cobalt	7.3 (<BG)	24	15.7 [c]	-- [f]	No	--
Copper	14.9 (<BG)	2,960	59.2	22.0[c]	No	--
Hexavalent chromium [e]	0.265	2.1 [d]	4.8	2	No	--
Lead	5.8 (<BG)	353	10.2 [c]	10.2 [c]	No	--
Manganese	336 (<BG)	3,760	512 [c]	512 [c]	No	--
Mercury	0.0094 (<BG)	24	0.33 [c]	0.33 [c]	No	--
Nickel	13.4 (<BG)	1,600	19.1[c]	27.4	No	--
Vanadium	40.7 (<BG)	560	85.1 [c]	-- [f]	No	--
Zinc	41.0 (<BG)	24,000	480	67.8 [c]	No	--
TPH – diesel range	7.451	200	200	200	No	--
TPH – motor oil	11.223	200	200	200	No	--
Bis(2-ethylhexyl)phthalate	0.057	71.4	0.6	0.36	No	--

[a] RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted.
[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.
[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).
[d] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[e] No Hanford Site-specific or Washington State background value is available.
[f] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).
[g] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

WAC Three-Part Test for Nonradionuclides

A RAG requirement for nonradionuclides is the WAC 173-340-740(7)(e) three-part test. The WAC 173-340 three-part test consists of the following criteria: (1) the cleanup verification 95% UCL value must be less than the cleanup level, (2) no single detection can exceed 2 times the cleanup criteria, and (3) the percentage of samples exceeding the cleanup criteria must be less than 10% of the data set.

The application of the three-part test for the 128-H-1 waste site is included in the statistical calculations (Appendix E). The results of this evaluation indicate that all residual COPC concentrations (except arsenic) pass the three-part test in comparison against applicable RAGs, except for lead, mercury, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene in comparison against the soil RAGs for groundwater and/or river protection in one or more sampling areas. However, as described above, based on RESRAD modeling, residual concentrations of these COPCs are not predicted to migrate to groundwater within 1,000 years, and are therefore protective of groundwater and the Columbia River.

An additional application of the three-part test is included for the statistical data sets which default to the maximum because less than half of the data set was detected. The results of this evaluation indicate that all residual COPC concentrations pass the three-part test in comparison against applicable RAGs, except for aroclor-1260 in comparison against the soil RAGs for groundwater and/or river protection in the east excavation area. However, as described above, residual concentrations of these COPCs are not predicted to migrate to groundwater within 1,000 years, and are therefore protective of groundwater and the Columbia River.

Direct Contact and Groundwater Protection Risk Evaluation for Nonradionuclides

Nonradionuclide risk requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6}, and a cumulative carcinogenic risk of less than 1×10^{-5}. For the 128-H-1 waste site, these risk values were not calculated for constituents that were either not detected or were detected at concentrations below Hanford Site or Washington State background levels. All individual hazard quotients for noncarcinogenic constituents were less than 1.0. The cumulative hazard quotient for those noncarcinogenic constituents above background or detected levels is 1.2×10^{-2}. The individual carcinogenic risk values for the carcinogenic constituents detected above background are less than 1×10^{-6}, and the cumulative carcinogenic risk value is 9.9×10^{-7}. The 128-H-1 waste site meets the requirements for the direct contact hazard quotient and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2009b).

Nonradionuclide Groundwater Hazard Quotient and Carcinogenic Risk RAGs Attained

Assessment of the risk requirements for the 128-H-1 waste site included calculation of the hazard quotient and carcinogenic (excess cancer) risk values for groundwater protection for nonradionuclides in Appendix E. The requirements include an individual and cumulative hazard quotient of less than 1.0, an individual excess carcinogenic risk of less than 1×10^{-6}, and a cumulative excess carcinogenic risk of less than 1×10^{-5}. These risk values were conservatively calculated for the entire waste site using the highest value for each COPC from each of the decision units. Risk values were calculated for constituents that were detected at concentrations above Hanford Site or Washington State background values or for which there is no background value. In addition, the distribution coefficients for these contaminants are less than that necessary to show no migration to groundwater in 1,000 years based on RESRAD modeling, discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b). Based on this model and solubility criteria, a K_d of 80 or greater is required to show no predicted migration to groundwater in 1,000 years. Contaminants with a K_d of 80 mL/g are highly adsorbed to soil particles and, even when immersed in water, any migration will be negligible.

All individual hazard quotients for noncarcinogenic constituents are less than 1.0. The cumulative hazard quotient for the 128-H-1 waste site is 5.7 x 10^{-1}, which is less than 1.0. The individual carcinogenic risk for aroclor-1254, the only carcinogen subject to the groundwater carcinogenic risk evaluation, is 2.2 x 10^{-6}. However, the highest detection of aroclor-1254 was in the east excavation area, where a K_d value of 12 mL/g or greater is required to show protection of groundwater based on a minimum vadose zone thickness of 6.0 m (20.0 ft). Therefore, aroclor-1254, with a K_d value of 75.6 mL/g, is included for completeness, but it is not necessary to calculate the groundwater excess cancer risk. All other site nonradionuclide COPCs were not detected, or quantified below background levels. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River. Nonradionuclide risk requirements related to groundwater are met.

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the verification sampling approaches and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications. The DQA for the 128-H-1 waste site establishes that the data are of the right type, quality, and quantity to support site verification decisions within specified error tolerances. The evaluation verified that the sample design and resulting data set are acceptable for decision-making purposes. The detailed DQA is presented in Appendix F.

SUMMARY FOR INTERIM CLOSURE

The 128-H-1 waste site has been remediated to meet the cleanup standards specified in the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2009). Remedial actions were performed to support future industrial land use and to protect groundwater and the Columbia River. Further, the residual contaminant concentrations achieved do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m {15 ft} deep). The site extended into the deep zone (greater than 4.6 m [15 ft] deep); however, the site was closed out using the shallow zone direct exposure, groundwater, and river protection cleanup criteria. In accordance with this evaluation, the verification sampling results support a reclassification of the 128-H-1 waste site to Interim Closed Out. Institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the site are not required.

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APPENDIX A

ECOLOGICAL RISK COMPARISON TABLE

Table A-1. Contaminants Exceeding Ecological Screening Levels for the 128-H-1 Waste Site [a].

Hazardous Substance		2007 WAC 173-340 Table 749-3			EPA Ecological Soil Screening Levels [b]				Maximum or Statistical Result
		Plants	Soil Biota	Wildlife	Plants	Soil Biota	Avian [c]	Mammalian [c]	
Metals (mg/kg)									
	Background								
Arsenic V	6.5 [d]	10	60	132	18	--	43	46	65.3 [e]
Barium	132	500	--	102	--	330	--	2,000	106 (<BG)
Boron	--	0.5	--	--	--	--	--	--	5.07
Lead	10.2	50	500	118	120	1,700	11	56	304
Manganese	512	1,100 [f]	--	1,500	220	450	4,300	4,000	340 (<BG)
Mercury	0.33	0.3	0.1	5.5	--	--	--	--	0.25 (<BG)
Vanadium	85.1	2	--	--	--	--	7.8	280	51.5 (<BG)
Zinc	67.8	86 [f]	200	360	160	120	46	79	49.5 (<BG)

NOTE: Shaded cells are exceeded by the maximum or the statistical result.

[a] Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors. All exceedances must be evaluated in the context of additional lines of evidence for ecological effects following a baseline risk assessment for the river corridor portion of the Hanford Site, which will include a more complete quantitative ecological risk assessment.

[b] Available on the internet at (www.epa.gov/ecotox/ecossl).

[c] Wildlife.

[d] The Hanford Site background for arsenic is 6.5 mg/kg. An arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.1.2.1 of the RDR/RAWP, DOE/RL-96-17, Rev. 6.

[e] Due to historical orchards present in this area and residual concentrations of arsenic exceeding RAGs not extending below 1 m (3 ft) bgs, arsenic is excluded as a contaminant of potential concern for the 128-H-1 waste site staging pile area footprint per Tri-Party Agreement Change Notice TPA-CN-401 (dated December 6, 2010).

[f] Benchmark replaced by Washington State natural background concentration.

-- = not available
BG = background
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
WAC = *Washington Administrative Code*

APPENDIX B

SUMMARY OF IN-PROCESS AND WASTE CHARACTERIZATION SAMPLE RESULTS

Table B-1. 128-H-1 Inorganic Sample Results - Inorganics. (4 Pages)

Sample Location	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	12000		5	0.6	U	0.6	3.4		1	828		0.5	0.9		0.2
Soil (pipeline release)	J191C5	7/6/2009	8630		5	0.459	U	0.459	3.15		1	72.2		0.5	0.322		0.2
Blue-green material	J19281	7/23/2009	202000		75.9	6.05		2.28	6.28		3.8	200		1.9	0.789		0.759
Soil containing ash (burn pit)	J195T6	9/8/2009	8880		6.65	0.511	B	0.8	17.4		1.33	123		0.67	0.282		0.27
Soil containing ash (burn pit)	J195T7	9/8/2009	9320		4.92	80		0.59	16.1		0.99	316		0.49	0.284		0.2
Soil containing ash (burn pit)	J195T8	9/8/2009	8410		5.35	15		0.64	12.7		1.07	300		0.54	0.271		0.21
Informational soil sample	J19DJ6	12/8/2009	4450		16.2	0.314	B	0.81	2.26		0.81	47.2		0.4	0.142	B	0.16
Informational soil sample	J19DJ7	12/8/2009	5710		16.1	0.343	B	0.8	3.57		0.8	50.1		0.4	0.155	B	0.16
Informational soil sample	J19DJ8	12/8/2009	6270		21.9	1.09	U	1.09	2.92		1.09	54		0.55	0.192	B	0.22
Informational soil sample	J19DJ9	12/8/2009	6080		20	0.388	B	1	5.44		1	56.3		0.5	0.188	B	0.2
Informational soil sample	J19DK0	12/8/2009	5990		18.7	0.333	B	0.94	3.74		0.94	58.4		0.47	0.177	B	0.19
Informational soil sample	J19DK1	12/8/2009	5460		19	1.41		0.95	3.44		0.95	88.5		0.48	0.163	B	0.19

Sample Location	Sample Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	48.4		2	0.08	B	0.2	14900		100	8.5		0.2	7.4		2
Soil (pipeline release)	J191C5	7/6/2009	2.14		2	0.153	U	0.2	3770		100	10.8		0.2	6.22		2
Blue-green material	J19281	7/23/2009	70.7		7.59	5.75		0.759	6790		380	95.4		0.759	4.33	B	7.59
Soil containing ash (burn pit)	J195T6	9/8/2009	8.82		2.66	0.588		0.27	15000		133	116		0.27	5.82		2.66
Soil containing ash (burn pit)	J195T7	9/8/2009	24.7		1.97	2.05		0.2	15900		98.5	136		0.2	8.35		1.97
Soil containing ash (burn pit)	J195T8	9/8/2009	13.8		2.14	1.56		0.21	13000		107	147		0.21	7.81		2.14
Informational soil sample	J19DJ6	12/8/2009	0.467	B	1.62	0.067	B	0.2	3120		16.2	10.9		0.81	4.44		2.42
Informational soil sample	J19DJ7	12/8/2009	0.745	B	1.61	0.068	B	0.2	2750		16.1	13.8		0.8	5.08		2.41
Informational soil sample	J19DJ8	12/8/2009	0.793	B	2.19	0.076	B	0.27	3160		21.9	13.3		1.09	5.45		3.28
Informational soil sample	J19DJ9	12/8/2009	0.915	B	2	0.118	B	0.25	2910		20	11.8		1	5.22		3.01
Informational soil sample	J19DK0	12/8/2009	1.06	B	1.87	0.156	B	0.23	3110		18.7	16.1		0.94	5.92		2.81
Informational soil sample	J19DK1	12/8/2009	5.14		1.9	0.818		0.24	3330		19	28.1		0.95	5.24		2.85

Acronyms and notes apply to all of the tables in this appendix.

B = analyte detected below PQL; therefore result is estimated
bgs = below ground surface
D = diluted
HEIS = Hanford Environmental Information System
J = estimate
MDA = minimum detectable activity
PCB = polychlorinated biphenyl
PQL = practical quantitation limit
Q = qualifier
R = rejected
SVOA = semivolatile organic analysis
TCLP = toxicity characteristic leachate procedure
U = undetected
VOA = volatile organic analysis

Table B-1. 128-H-1 Inorganic Sample Results - Inorganics. (4 Pages)

Sample Location	Sample Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	42.9		1				8120		14.5	2.4		0.5	2750		75
Soil (pipeline release)	J191C5	7/6/2009	12.8		1	0.22	U	0.22	17600		15.3	5.2		0.5	4120		75
Blue-green material	J19281	7/23/2009	9370		3.8				13300		75.9	404		1.9	6660		285
Soil containing ash (burn pit)	J195T6	9/8/2009	27.2		1.33	0.28	U	0.28	17100		26.6	156		0.67	4510		99.7
Soil containing ash (burn pit)	J195T7	9/8/2009	407		0.99	0.24	U	0.24	32200		19.7	637		0.49	5340		73.8
Soil containing ash (burn pit)	J195T8	9/8/2009	359		1.07	0.22	U	0.22	35500		21.4	285		0.54	4470		80.3
Informational soil sample	J19DJ6	12/8/2009	10.8		1.62	0.22	U	0.22	13700		16.2	3.79		0.81	2890		4.04
Informational soil sample	J19DJ7	12/8/2009	13		1.61	0.22	U	0.22	14900		16.1	9.55		0.8	3590		4.02
Informational soil sample	J19DJ8	12/8/2009	18.4		2.19	0.22	U	0.22	15900		21.9	4.32		1.09	4030		5.47
Informational soil sample	J19DJ9	12/8/2009	13.8		2	0.24	U	0.24	15400		20	11.8		1	3530		5.01
Informational soil sample	J19DK0	12/8/2009	23.7		1.87	0.24	U	0.24	18100		18.7	15.1		0.94	3900		4.68
Informational soil sample	J19DK1	12/8/2009	142		1.9	0.23	U	0.23	17000		19	102		0.95	3570		4.75

Sample Location	Sample Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	115		5	0.021	B	0.028	1.7	B	2	21		4	473		400
Soil (pipeline release)	J191C5	7/6/2009	260		5	0.026	U	0.026	0.21	B	2	11.9		4	1400		400
Blue-green material	J19281	7/23/2009	1680		19	0.139		0.027	18.7		7.59	34.5		15.2	654	B	1520
Soil containing ash (burn pit)	J195T6	9/8/2009	476		6.65	0.019	B	0.04	1.09	B	2.66	12		5.32	2060		532
Soil containing ash (burn pit)	J195T7	9/8/2009	498		4.92	0.618		0.03	4.26		1.97	37.9		3.94	2050		394
Soil containing ash (burn pit)	J195T8	9/8/2009	592		5.35	0.54		0.03	3.34		2.14	30.9		4.28	1790		428
Informational soil sample	J19DJ6	12/8/2009	188		0.81	0.025	B	0.03	0.27	B	0.81	5.84		2.02	512		80.8
Informational soil sample	J19DJ7	12/8/2009	220		0.8	0.021	B	0.03	0.325	B	0.8	8.57		2.01	681		80.3
Informational soil sample	J19DJ8	12/8/2009	223		1.09	0.027	B	0.03	0.288	B	1.09	10.2		2.74	698		109
Informational soil sample	J19DJ9	12/8/2009	274		1	0.026	B	0.03	0.317	B	1	9.09		2.5	788		100
Informational soil sample	J19DK0	12/8/2009	282		0.94	0.041		0.03	0.896	B	0.94	11.5		2.34	708		93.6
Informational soil sample	J19DK1	12/8/2009	228		0.95	0.396		0.03	2.79		0.95	39.2		2.38	730		95.1

Table B-1. 128-H-1 Inorganic Sample Results - Inorganics. (4 Pages)

Sample Location	Sample Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	1	U	1	545		2	0.2	U	0.2	672		50	53.1		2.5
Soil (pipeline release)	J191C5	7/6/2009	0.765	U	1	705		2	0.153	U	0.153	222		50	35.9		2.5
Blue-green material	J19281	7/23/2009	1.69	B	3.8	1560		7.59	9.87		0.759	1190		190	30.4		9.49
Soil containing ash (burn pit)	J195T6	9/8/2009	1.33	U	1.33	656		2.66	0.266	U	0.27	515		66.5	36.2		3.32
Soil containing ash (burn pit)	J195T7	9/8/2009	0.985	U	0.99	719		1.97	1.2		0.2	963		49.2	38.8		2.46
Soil containing ash (burn pit)	J195T8	9/8/2009	0.362	B	1.07	643		2.14	0.62		0.21	535		53.5	40.7		2.68
Informational soil sample	J19DJ6	12/8/2009	0.242	U	0.24	404		4.85	0.808	U	0.81	182		40.4	32.3		0.81
Informational soil sample	J19DJ7	12/8/2009	0.241	U	0.24	448		4.82	0.803	U	0.8	182		40.2	38.2		0.8
Informational soil sample	J19DJ8	12/8/2009	0.328	U	0.33	481		6.57	1.09	U	1.09	173		54.7	40.5		1.09
Informational soil sample	J19DJ9	12/8/2009	0.301	U	0.3	586		6.01	1	U	1	176		50.1	37.7		1
Informational soil sample	J19DK0	12/8/2009	0.281	U	0.28	527		5.61	0.936	U	0.94	181		46.8	43.8		0.94
Informational soil sample	J19DK1	12/8/2009	0.285	U	0.29	484		5.7	1.09		0.95	207		47.5	32.1		0.95

Sample Location	Sample Number	Sample Date	Zinc			Bromide			Chloride			Cyanide			Flouride		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	15.6		7.2	Not Analyzed											
Soil (pipeline release)	J191C5	7/6/2009	36.6		7.65												
Blue-green material	J19281	7/23/2009	854		38	2.9	U	2.9	150	D	29	0.5	U	0.5	2.9	U	2.9
Soil containing ash (burn pit)	J195T6	9/8/2009	165		13.3	Not Analyzed											
Soil containing ash (burn pit)	J195T7	9/8/2009	749		9.85												
Soil containing ash (burn pit)	J195T8	9/8/2009	614		10.7												
Informational soil sample	J19DJ6	12/8/2009	32.3		2.42	2.6	U	2.6	9.5		2.6	Not Analyzed			2.6	U	2.6
Informational soil sample	J19DJ7	12/8/2009	34.9		2.41	2.5	U	2.5	2.5	U	2.5				2.5	U	2.5
Informational soil sample	J19DJ8	12/8/2009	42.1		3.28	2.9	U	2.9	3		2.9				2.9	U	2.9
Informational soil sample	J19DJ9	12/8/2009	35.1		3.01	2.9	U	2.9	10.9		2.9				2.9	U	2.9
Informational soil sample	J19DK0	12/8/2009	56.5		2.81	3.1	U	3.1	3.2		3.1				0.4	B	3.1
Informational soil sample	J19DK1	12/8/2009	158		2.85	2.8	U	2.8	20.4		2.8				1.1	B	2.8

Table B-1. 128-H-1 Inorganic Sample Results - Inorganics. (4 Pages)

Sample Location	Sample Number	Sample Date	Nitrate			Phosphate			Sulfate			Sulfide			pH
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	pH Units
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	Not Analyzed												
Soil (pipeline release)	J191C5	7/6/2009	Not Analyzed												8.08
Blue-green material	J19281	7/23/2009	8.7		2.9	2.9	U	2.9	1310	D	145	6.43	B	20	8.02
Soil containing ash (burn pit)	J195T6	9/8/2009	Not Analyzed												
Soil containing ash (burn pit)	J195T7	9/8/2009	Not Analyzed												
Soil containing ash (burn pit)	J195T8	9/8/2009	Not Analyzed												
Informational soil sample	J19DJ6	12/8/2009	2.6	U	2.6	2.6	U	2.6	62.8		2.6	Not Analyzed			8.74
Informational soil sample	J19DJ7	12/8/2009	2.5	U	2.5	2.5	U	2.5	13.7		2.5				8.26
Informational soil sample	J19DJ8	12/8/2009	2.9	U	2.9	2.9	U	2.9	17.5		2.9				7.71
Informational soil sample	J19DJ9	12/8/2009	2.9	U	2.9	2.9	U	2.9	82.7		2.9				7.88
Informational soil sample	J19DK0	12/8/2009	3.1	U	3.1	3.1	U	3.1	32.7		3.1				8.13
Informational soil sample	J19DK1	12/8/2009	2.8	U	2.8	2.8	U	2.8	196	D	14				8.52

Sample Location	Sample Number	Sample Date	TCLP Arsenic			TCLP Barium			TCLP Cadmium			TCLP Chromium			TCLP Lead		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Blue-green material	J19281	7/23/2009	0.09	U	0.09	0.736		0.006	0.034		0.018	0.058		0.03	0.564		0.06
Soil containing ash (burn pit)	J195T6	9/8/2009	0.043	B	0.06	0.593		0.01	0.015		0.01	0.007	B	0.01	0.315		0.06
Soil containing ash (burn pit)	J195T7	9/8/2009	0.06	U	0.06	0.316		0.01	0.015		0.01	0.009	B	0.01	0.359		0.06
Soil containing ash (burn pit)	J195T8	9/8/2009	0.06	U	0.06	0.416		0.01	0.017		0.01	0.014		0.01	0.289		0.06

Sample Location	Sample Number	Sample Date	TCLP Mecury			TCLP Selenium			TCLP Silver		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Blue-green material	J19281	7/23/2009	0.2	U	0.2	0.12	U	0.12	0.036	U	0.036
Soil containing ash (burn pit)	J195T6	9/8/2009	0.0002	U	0.0002	0.06	U	0.06	0.03	U	0.03
Soil containing ash (burn pit)	J195T7	9/8/2009	0.0002	U	0.0002	0.06	U	0.06	0.03	U	0.03
Soil containing ash (burn pit)	J195T8	9/8/2009	0.0002	U	0.0002	0.06	U	0.06	0.03	U	0.03

Table B-2. 128-H-1 Organic Sample Results - Organics. (7 Pages)

Constituent	J18X02			J191C5			J19281			J195T6		
	5/14/2009			7/6/2009			7/23/2009			9/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Herbicides												
2,4,5-Trichlorophenoxyacetic acid							16.7	U	16.7			
2,4-Dichlorophenoxyacetic acid							33.3	U	33.3			
2-(2,4,5-Trichlorophenoxy)propionic acid							16.7	U	16.7			
2-secButyl-4,6-dinitrophenol(DNBP)	Not Analyzed						16.7	U	16.7	Not Analyzed		
4-(2,4-Dichlorophenoxy)butanoic acid							16.7	U	16.7			
Dalapon							33.3	U	33.3			
Dicamba							33.3	U	33.3			
Dichloroprop							33.3	U	33.3			
PCBs												
Aroclor-1016	13.3	U	13.3	13.3		13.3	13.3	U	13.3	18.4	U	18.4
Aroclor-1221	13.3	U	13.3	13.3		13.3	13.3	U	13.3	18.4	U	18.4
Aroclor-1232	13.3	U	13.3	13.3		13.3	13.3	U	13.3	18.4	U	18.4
Aroclor-1242	13.3	U	13.3	13.3		13.3	13.3	U	13.3	18.4	U	18.4
Aroclor-1248	13.3	U	13.3	13.3		13.3	13.3	U	13.3	18.4	U	18.4
Aroclor-1254	13.3	U	13.3	13.3		13.3	47.3		13.3	17.9	J	18.4
Aroclor-1260	13.3	U	13.3	13.3		13.3	26		13.3	18.4	U	18.4
Aroclor-1262	13.3	U	13.3	Not Analyzed								
Aroclor-1268	13.3	U	13.3									
Pesticides												
Aldrin	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Alpha-BHC	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
alpha-Chlordane	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Delta-BHC	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Dichlorodiphenyldichloroethane	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Dichlorodiphenyldichloroethylene	1.33	UD	1.33	Not Analyzed			15.1		0.33	1.84	U	1.84
Dichlorodiphenyltrichloroethane	1.33	UD	1.33				17.5		0.33	1.84	U	1.84
Dieldrin	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Endosulfan I	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Endosulfan II	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Endosulfan sulfate	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Endrin	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Endrin aldehyde	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Endrin ketone	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Gamma-BHC (Lindane)	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
gamma-Chlordane	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Heptachlor	1.33	UD	1.33	Not Analyzed			0.33	U	0.33	1.84	U	1.84
Heptachlor epoxide	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Methoxychlor	1.33	UD	1.33				0.33	U	0.33	1.84	U	1.84
Toxaphene	20	UD	20				5	U	5	27.6	U	27.6
SVOAs												
1,2,4-Trichlorobenzene	660	UD	660	369		369	330	U	330	912	U	912
1,2-Dichlorobenzene	660	UD	660	369		369	330	U	330	912	U	912
1,3-Dichlorobenzene	660	UD	660	369		369	330	U	330	912	U	912
1,4-Dichlorobenzene	660	UD	660	369		369	330	U	330	912	U	912
2,4,5-Trichlorophenol	660	UD	660	369		369	330	U	330	912	U	912
2,4,6-Trichlorophenol	660	UD	660	369		369	330	U	330	912	U	912
2,4-Dichlorophenol	660	UD	660	369		369	330	U	330	912	U	912
2,4-Dimethylphenol	660	UD	660	369		369	330	U	330	912	U	912
2,4-Dinitrophenol	3300	UD	3300	1840		1840	1650	U	1650	4560	U	4560

Table B-2. 128-H-1 Organic Sample Results - Organics. (7 pages)

Constituent	J18X02			J191C5			J19281			J195T6		
	5/14/2009			7/6/2009			7/23/2009			9/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
2,4-Dinitrotoluene	660	UD	660	369		369	330	U	330	912	U	912
2,6-Dinitrotoluene	660	UD	660	369		369	330	U	330	912	U	912
2-Chloronaphthalene	660	UD	660	369		369	330	U	330	912	U	912
2-Chlorophenol	660	UD	660	369		369	330	U	330	912	U	912
2-Methylnaphthalene	377	D J	660	369		369	330	U	330	912	U	912
2-Methylphenol (cresol, o-)	660	UD	660	369		369	330	U	330	912	U	912
2-Nitroaniline	3300	UD	3300	1840		1840	1650	U	1650	4560	U	4560
2-Nitrophenol	660	UD	660	369		369	330	U	330	912	U	912
3+4 Methylphenol (cresol, m+p)	660	UD	660	369		369	330	U	330	912	U	912
3,3'-Dichlorobenzidine	1320	UD	1320	737		737	660	U	660	1820	U	1820
3-Nitroaniline	3300	UD	3300	1840		1840	1650	U	1650	4560	U	4560
4,6-Dinitro-2-methylphenol	660	UD	660	369		369	330	U	330	912	U	912
4-Bromophenylphenyl ether	660	UD	660	369		369	330	U	330	912	U	912
4-Chloro-3-methylphenol	660	UD	660	369		369	330	U	330	912	U	912
4-Chloroaniline	660	UD	660	369		369	330	U	330	912	U	912
4-Chlorophenylphenyl ether	660	UD	660	369		369	330	U	330	912	U	912
4-Nitroaniline	3300	UD	3300	1840		1840	1650	U	1650	4560	U	4560
4-Nitrophenol	3300	UD	3300	1840		1840	1650	U	1650	4560	U	4560
Acenaphthene	660	UD	660	369		369	330	U	330	912	U	912
Acenaphthylene	660	UD	660	369		369	330	U	330	912	U	912
Anthracene	660	UD	660	369		369	330	U	330	912	U	912
Benzo(a)anthracene	660	UD	660	369		369	330	U	330	912	U	912
Benzo(a)pyrene	660	UD	660	369		369	330	U	330	912	U	912
Benzo(b)fluoranthene	660	UD	660	369		369	330	U	330	912	U	912
Benzo(ghi)perylene	660	UD	660	369		369	330	U	330	912	U	912
Benzo(k)fluoranthene	660	UD	660	369		369	330	U	330	912	U	912
Bis(2-chloro-1-methylethyl)ether	660	UD	660	369		369	330	U	330	912	U	912
Bis(2-Chloroethoxy)methane	660	UD	660	369		369	330	U	330	912	U	912
Bis(2-chloroethyl) ether	660	UD	660	369		369	330	U	330	912	U	912
Bis(2-ethylhexyl) phthalate	660	UD	660	369		369	330	U	330	912	U	912
Butylbenzylphthalate	660	UD	660	369		369	330	U	330	912	U	912
Carbazole	660	UD	660	369		369	330	U	330	912	U	912
Chrysene	660	UD	660	369		369	330	U	330	912	U	912
Di-n-butylphthalate	660	UD	660	369		369	330	U	330	912	U	912
Di-n-octylphthalate	660	UD	660	369		369	330	U	330	912	U	912
Dibenz[a,h]anthracene	660	UD	660	369		369	330	U	330	912	U	912
Dibenzofuran	660	UD	660	369		369	330	U	330	912	U	912
Diethyl phthalate	660	UD	660	369		369	330	U	330	912	U	912
Dimethyl phthalate	660	UD	660	369		369	330	U	330	912	U	912
Fluoranthene	660	UD	660	369		369	330	U	330	912	U	912
Fluorene	660	UD	660	369		369	330	U	330	912	U	912
Hexachlorobenzene	660	UD	660	369		369	330	U	330	912	U	912
Hexachlorobutadiene	660	UD	660	369		369	330	U	330	912	U	912
Hexachlorocyclopentadiene	660	UD	660	369		369	330	U	330	912	U	912
Hexachloroethane	660	UD	660	369		369	330	U	330	912	U	912
Indeno(1,2,3-cd)pyrene	660	UD	660	369		369	330	U	330	912	U	912
Isophorone	660	UD	660	369		369	330	U	330	912	U	912
N-Nitroso-di-n-dipropylamine	660	UD	660	369		369	330	U	330	912	U	912
N-Nitrosodiphenylamine	660	UD	660	369		369	330	U	330	912	U	912
Naphthalene	261	J D	660	369		369	330	U	330	912	U	912
Nitrobenzene	660	UD	660	369		369	330	U	330	912	U	912

Table B-2. 128-H-1 Organic Sample Results - Organics. (7 Pages)

Constituent	J18X02 5/14/2009			J191C5 7/6/2009			J19281 7/23/2009			J195T6 9/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Pentachlorophenol	3300	UD	3300	1840		1840	1650	U	1650	4560	U	4560
Phenanthrene	660	UD	660	369		369	330	U	330	912	U	912
Phenol	660	UD	660	369		369	330	U	330	912	U	912
Pyrene	660	UD	660	369		369	330	U	330	912	U	912
VOAs												
1,1,1-Trichloroethane	5	U	5	Not Analyzed						6.91	U	6.91
1,1,2,2-Tetrachloroethane	5	U	5							6.91	U	6.91
1,1,2-Trichloroethane	5	U	5							6.91	U	6.91
1,1-Dichloroethane	5	U	5							6.91	U	6.91
1,1-Dichloroethene	5	U	5							6.91	U	6.91
1,2-Dichloroethane	6	U	6							8.29	U	8.29
1,2-Dichloroethene(Total)	5	U	5							6.91	U	6.91
1,2-Dichloropropane	5	U	5							6.91	U	6.91
2-Butanone	12	U	12							16.6	U	16.6
2-Hexanone	12	U	12							16.6	U	16.6
4-Methyl-2-Pentanone	12	U	12							16.6	U	16.6
Acetone	12	U	12							16.6	U	16.6
Benzene	5	U	5							6.91	U	6.91
Bromodichloromethane	6	U	6							8.29	U	8.29
Bromoform	5	U	5							6.91	U	6.91
Bromomethane	10	U	10							13.8	U	13.8
Carbon disulfide	5	U	5							6.91	U	6.91
Carbon tetrachloride	5	U	5							6.91	U	6.91
Chlorobenzene	5	U	5							6.91	U	6.91
Chloroethane	10	U	10							13.8	U	13.8
Chloroform	5	U	5							6.91	U	6.91
Chloromethane	10	U	10							13.8	U	13.8
cis-1,2-Dichloroethylene	5	U	5							6.91	U	6.91
cis-1,3-Dichloropropene	5	U	5							6.91	U	6.91
Dibromochloromethane	5	U	5							6.91	U	6.91
Ethylbenzene	5	U	5							6.91	U	6.91
Methylenechloride	2.33	J	5							8.29	U	8.29
Styrene	5	U	5							6.91	U	6.91
Tetrachloroethene	5	U	5							6.91	U	6.91
Toluene	5	U	5							6.91	U	6.91
trans-1,2-Dichloroethylene	5	U	5							6.91	U	6.91
trans-1,3-Dichloropropene	5	U	5							6.91	U	6.91
Trichloroethene	5	U	5							6.91	U	6.91
Vinyl chloride	10	U	10							13.8	U	13.8
Xylenes (total)	6	U	6							8.29	U	8.29

Constituent	J195T7			J195T8			J19DJ6			J19DJ7		
	9/8/2009			9/8/2009			12/8/2009			12/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Polycyclic Aromatic Hydrocarbons												
Acenaphthene							37.2	U	37.2	36	U	36
Acenaphthylene							37.2	U	37.2	36	U	36
Anthracene							3.72	U	3.72	3.6	U	3.6
Benzo(a)anthracene							3.72	U	3.72	3.6	U	3.6
Benzo(a)pyrene							3.72	U	3.72	3.6	U	3.6
Benzo(b)fluoranthene							1.11	J	3.72	3.6	U	3.6
Benzo(ghi)perylene							3.72	U	3.72	1.26	J	3.6
Benzo(k)fluoranthene	Not Analyzed						3.72	U	3.72	3.6	U	3.6
Chrysene							3.72	U	3.72	1.79	J	3.6
Dibenz[a,h]anthracene							3.72	U	3.72	3.6	U	3.6
Fluoranthene							5.02		3.72	3.6	U	3.6
Fluorene							4.09		3.72	3.6	U	3.6
Indeno(1,2,3-cd)pyrene							3.72	U	3.72	3.6	U	3.6
Naphthalene							37.2	U	37.2	36	U	36
Phenanthrene							2.04	J	3.72	1.26	J	3.6
Pyrene							3.72	U	3.72	3.6	U	3.6
PCBs												
Aroclor-1016	81.2	UD	81.2	14.5	U	14.5	14.8	U	14.8	14.3	U	14.3
Aroclor-1221	81.2	UD	81.2	14.5	U	14.5	14.8	U	14.8	14.3	U	14.3
Aroclor-1232	81.2	UD	81.2	14.5	U	14.5	14.8	U	14.8	14.3	U	14.3
Aroclor-1242	81.2	UD	81.2	14.5	U	14.5	14.8	U	14.8	14.3	U	14.3
Aroclor-1248	81.2	UD	81.2	14.5	U	14.5	14.8	U	14.8	14.3	U	14.3
Aroclor-1254	584	D	81.2	52.1		14.5	14.8	U	14.8	3.88	J	14.3
Aroclor-1260	114	D	81.2	27.3		14.5	14.8	U	14.8	14.3	U	14.3
Aroclor-1262	Not Analyzed											
Aroclor-1268												
Pesticides												
Aldrin	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Alpha-BHC	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
alpha-Chlordane	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Delta-BHC	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Dichlorodiphenyldichloroethane	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Dichlorodiphenyldichloroethylene	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Dichlorodiphenyltrichloroethane	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Dieldrin	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Endosulfan I	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Endosulfan II	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Endosulfan sulfate	1.63	UD	1.63	1.82	JD	1.82	1.48	U	1.48	1.43	U	1.43
Endrin	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Endrin aldehyde	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Endrin ketone	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Gamma-BHC (Lindane)	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
gamma-Chlordane	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Heptachlor	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Heptachlor epoxide	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Methoxychlor	1.63	UD	1.63	1.45	U	1.45	1.48	U	1.48	1.43	U	1.43
Toxaphene	24.4	UD	24.4	21.8	U	21.8	22.3	U	22.3	21.5	U	21.5

Table B-2. 128-H-1 Organic Sample Results - Organics. (7 Pages)

Constituent	J195T7 9/8/2009			J195T8 9/8/2009			J19DJ6 12/8/2009			J19DJ7 12/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	1610	UD	1610	1080	U	1080						
1,2-Dichlorobenzene	1610	UD	1610	1080	U	1080						
1,3-Dichlorobenzene	1610	UD	1610	1080	U	1080						
1,4-Dichlorobenzene	1610	UD	1610	1080	U	1080						
2,4,5-Trichlorophenol	1610	UD	1610	1080	U	1080						
2,4,6-Trichlorophenol	1610	UD	1610	1080	U	1080						
2,4-Dichlorophenol	1610	UD	1610	1080	U	1080						
2,4-Dimethylphenol	1610	UD	1610	1080	U	1080						
2,4-Dinitrophenol	8060	UD	8060	5410	U	5410						
2,4-Dinitrotoluene	1610	UD	1610	1080	U	1080						
2,6-Dinitrotoluene	1610	UD	1610	1080	U	1080						
2-Chloronaphthalene	1610	UD	1610	1080	U	1080						
2-Chlorophenol	1610	UD	1610	1080	U	1080						
2-Methylnaphthalene	1610	UD	1610	1080	U	1080						
2-Methylphenol (cresol, o-)	1610	UD	1610	1080	U	1080						
2-Nitroaniline	8060	UD	8060	5410	U	5410						
2-Nitrophenol	1610	UD	1610	1080	U	1080						
3+4 Methylphenol (cresol, m+p)	1610	UD	1610	1080	U	1080						
3,3'-Dichlorobenzidine	3220	UD	3220	2160	U	2160						
3-Nitroaniline	8060	UD	8060	5410	U	5410						
4,6-Dinitro-2-methylphenol	1610	UD	1610	1080	U	1080						
4-Bromophenylphenyl ether	1610	UD	1610	1080	U	1080						
4-Chloro-3-methylphenol	1610	UD	1610	1080	U	1080						
4-Chloroaniline	1610	UD	1610	1080	U	1080						
4-Chlorophenylphenyl ether	1610	UD	1610	1080	U	1080						
4-Nitroaniline	8060	UD	8060	5410	U	5410	Not Analyzed					
4-Nitrophenol	8060	UD	8060	5410	U	5410						
Acenaphthene	1610	UD	1610	1080	U	1080						
Acenaphthylene	1610	UD	1610	1080	U	1080						
Anthracene	281	JD	1610	1080	U	1080						
Benzo(a)anthracene	775	JD	1610	181	JD	1080						
Benzo(a)pyrene	684	JD	1610	209	JD	1080						
Benzo(b)fluoranthene	622	JD	1610	186	JD	1080						
Benzo(ghi)perylene	402	JD	1610	1080	U	1080						
Benzo(k)fluoranthene	617	JD	1610	1080	U	1080						
Bis(2-chloro-1-methylethyl)ether	1610	UD	1610	1080	U	1080						
Bis(2-Chloroethoxy)methane	1610	UD	1610	1080	U	1080						
Bis(2-chloroethyl) ether	1610	UD	1610	1080	U	1080						
Bis(2-ethylhexyl) phthalate	1610	UD	1610	1080	U	1080						
Butylbenzylphthalate	1610	UD	1610	1080	U	1080						
Carbazole	1610	UD	1610	1080	U	1080						
Chrysene	753	JD	1610	180	JD	1080						
Di-n-butylphthalate	1610	UD	1610	343	JD	1080						
Di-n-octylphthalate	1610	UD	1610	1080	U	1080						
Dibenz[a,h]anthracene	1610	UD	1610	1080	U	1080						
Dibenzofuran	1610	UD	1610	1080	U	1080						
Diethyl phthalate	1610	UD	1610	1080	U	1080						
Dimethyl phthalate	1610	UD	1610	1080	U	1080						
Fluoranthene	1520	JD	1610	265	JD	1080						
Fluorene	1610	UD	1610	1080	U	1080						

Table B-2. 128-H-1 Organic Sample Results - Organics. (7 Pages)

Constituent	J195T7			J195T8			J19DJ6			J19DJ7		
	9/8/2009			9/8/2009			12/8/2009			12/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	1610	UD	1610	1080	U	1080	Not Analyzed					
Hexachlorobutadiene	1610	UD	1610	1080	U	1080						
Hexachlorocyclopentadiene	1610	UD	1610	1080	U	1080						
Hexachloroethane	1610	UD	1610	1080	U	1080						
Indeno(1,2,3-cd)pyrene	379	JD	1610	1080	U	1080						
Isophorone	1610	UD	1610	1080	U	1080						
N-Nitroso-di-n-dipropylamine	1610	UD	1610	1080	U	1080						
N-Nitrosodiphenylamine	1610	UD	1610	1080	U	1080						
Naphthalene	1610	UD	1610	1080	U	1080						
Nitrobenzene	1610	UD	1610	1080	U	1080						
Pentachlorophenol	8060	UD	8060	5410	U	5410						
Phenanthrene	1170	JD	1610	193	JD	1080						
Phenol	1610	UD	1610	1080	U	1080						
Pyrene	1490	JD	1610	285	JD	1080						
VOAs												
1,1,1-Trichloroethane	5.99	U	5.99	5.15	U	5.15	Not Analyzed					
1,1,2,2-Tetrachloroethane	5.99	U	5.99	5.15	U	5.15						
1,1,2-Trichloroethane	5.99	U	5.99	5.15	U	5.15						
1,1-Dichloroethane	5.99	U	5.99	5.15	U	5.15						
1,1-Dichloroethene	5.99	U	5.99	5.15	U	5.15						
1,2-Dichloroethane	7.18	U	7.18	6.18	U	6.18						
1,2-Dichloroethene(Total)	5.99	U	5.99	5.15	U	5.15						
1,2-Dichloropropane	5.99	U	5.99	5.15	U	5.15						
2-Butanone	14.4	U	14.4	12.4	U	12.4						
2-Hexanone	14.4	U	14.4	12.4	U	12.4						
4-Methyl-2-Pentanone	14.4	U	14.4	12.4	U	12.4						
Acetone	14.4	U	14.4	12.4	U	12.4						
Benzene	5.99	U	5.99	5.15	U	5.15						
Bromodichloromethane	7.18	U	7.18	6.18	U	6.18						
Bromoform	5.99	U	5.99	5.15	U	5.15						
Bromomethane	12	U	12	10.3	U	10.3						
Carbon disulfide	5.99	U	5.99	5.15	U	5.15						
Carbon tetrachloride	5.99	U	5.99	5.15	U	5.15						
Chlorobenzene	5.99	U	5.99	5.15	U	5.15						
Chloroethane	12	U	12	10.3	U	10.3						
Chloroform	5.99	U	5.99	5.15	U	5.15						
Chloromethane	12	U	12	10.3	U	10.3						
cis-1,2-Dichloroethylene	5.99	U	5.99	5.15	U	5.15						
cis-1,3-Dichloropropene	5.99	U	5.99	5.15	U	5.15						
Dibromochloromethane	5.99	U	5.99	5.15	U	5.15						
Ethylbenzene	5.99	U	5.99	5.15	U	5.15						
Methylenechloride	7.18	U	7.18	6.18	U	6.18						
Styrene	5.99	U	5.99	5.15	U	5.15						
Tetrachloroethene	5.99	U	5.99	5.15	U	5.15						
Toluene	5.99	U	5.99	5.15	U	5.15						
trans-1,2-Dichloroethylene	5.99	U	5.99	5.15	U	5.15						
trans-1,3-Dichloropropene	5.99	U	5.99	5.15	U	5.15						
Trichloroethene	5.99	U	5.99	5.15	U	5.15						
Vinyl chloride	12	U	12	10.3	U	10.3						
Xylenes (total)	7.18	U	7.18	6.18	U	6.18						

Table B-2. 128-H-1 Organic Sample Results - Organics. (7 Pages)

Constituent	J19DJ8			J19DJ9			J19DK0			J19DK1		
	12/8/2009			12/8/2009			12/8/2009			12/8/2009		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	36.6	U	36.6	40.8	U	40.8	39.4	U	39.4	38.7	U	38.7
Acenaphthylene	36.6	U	36.6	40.8	U	40.8	39.4	U	39.4	38.7	U	38.7
Anthracene	3.66	U	3.66	4.08	U	4.08	3.94	U	3.94	3.87	U	3.87
Benzo(a)anthracene	1.28	J	3.66	11.2		4.08	1.77	J	3.94	1.55	J	3.87
Benzo(a)pyrene	3.66	U	3.66	3.67	J	4.08	1.18	J	1.18	1.16	J	3.87
Benzo(b)fluoranthene	3.66	U	3.66	10.4		4.08	1.96	J	1.18	2.9	J	3.87
Benzo(ghi)perylene	3.66	U	3.66	3.26	J	4.08	3.94	U	3.94	1.35	J	3.87
Benzo(k)fluoranthene	3.66	U	3.66	1.83	J	4.08	3.94	U	3.94	3.87	U	3.87
Chrysene	3.66	U	3.66	15.7		4.08	3.94	U	3.94	3.87	U	3.87
Dibenz[a,h]anthracene	3.66	U	3.66	3.26	J	4.08	3.94	U	3.94	3.87	U	3.87
Fluoranthene	3.66	U	3.66	3.26	J	4.08	1.77	J	3.94	5.22		3.87
Fluorene	3.66	U	3.66	4.08	U	4.08	3.94	U	3.94	3.87	U	3.87
Indeno(1,2,3-cd)pyrene	3.66	U	3.66	4.08	U	4.08	3.94	U	3.94	3.87	U	3.87
Naphthalene	36.6	U	36.6	40.8	U	40.8	39.4	U	39.4	38.7	U	38.7
Phenanthrene	1.46	J	3.66	1.22	J	4.08	2.55	J	3.94	2.71	J	3.87
Pyrene	3.66	U	3.66	5.09		4.08	3.34	J	3.94	2.71	J	3.87
PCBs												
Aroclor-1016	14.6	U	14.6	16.3	U	16.3	15.7	U	15.7	30.8	U	30.8
Aroclor-1221	14.6	U	14.6	16.3	U	16.3	15.7	U	15.7	30.8	U	30.8
Aroclor-1232	14.6	U	14.6	16.3	U	16.3	15.7	U	15.7	30.8	U	30.8
Aroclor-1242	14.6	U	14.6	16.3	U	16.3	15.7	U	15.7	30.8	U	30.8
Aroclor-1248	14.6	U	14.6	16.3	U	16.3	15.7	U	15.7	30.8	U	30.8
Aroclor-1254	14.6	U	14.6	16.3	U	16.3	40.7		15.7	30.8	U	30.8
Aroclor-1260	14.6	U	14.6	16.3	U	16.3	4.4	J	15.7	269	D	30.8
Aroclor-1262	Not Analyzed											
Aroclor-1268												
Pesticides												
Aldrin	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Alpha-BHC	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
alpha-Chlordane	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Delta-BHC	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Dichlorodiphenyldichloroethane	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Dichlorodiphenyldichloroethylene	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Dichlorodiphenyltrichloroethane	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Dieldrin	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	2.71	D	1.54
Endosulfan I	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Endosulfan II	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Endosulfan sulfate	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Endrin	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Endrin aldehyde	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Endrin ketone	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Gamma-BHC (Lindane)	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
gamma-Chlordane	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Heptachlor	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Heptachlor epoxide	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Methoxychlor	1.46	UD	1.46	1.63	U	1.63	1.57	U	1.57	1.54	U	1.54
Toxaphene	21.9	UD	21.9	24.4	U	24.4	23.6	U	23.6	23.2	U	23.2

Table B-3. 128-H-1 Radiological Sample Results.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Cesium-137		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	0.148	U	0.148	0.133	U	0.133	0.13	U	0.13
Soil (pipeline release)	J191C5	7/6/2009	0.078	U	0.078				0.059	U	0.059
Blue-green material	J19281	7/23/2009	0.026	U	0.026	0.007	U	0.007	0.034		0.008
Soil containing ash (burn pit)	J195T6	9/8/2009	0.175	U	0.175	0.06	U	0.06	0.047	U	0.047
Soil containing ash (burn pit)	J195T7	9/8/2009	0.506	U	0.506	0.152	U	0.152	0.142	U	0.142
Soil containing ash (burn pit)	J195T8	9/8/2009	0.129	U	0.129	0.173	U	0.173	0.149	U	0.149

Sample Location	HEIS Number	Sample Date	Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	0.121	U	0.121	0.367	U	0.367	0.361	U	0.361
Soil (pipeline release)	J191C5	7/6/2009	0.07	U	0.07	0.158	U	0.158	0.226	U	0.226
Blue-green material	J19281	7/23/2009	0.005	U	0.005	0.017	U	0.017	0.018	U	0.018
Soil containing ash (burn pit)	J195T6	9/8/2009	0.049	U	0.049	0.118	U	0.118	0.176	U	0.176
Soil containing ash (burn pit)	J195T7	9/8/2009	0.143	U	0.143	0.381	U	0.381	0.391	U	0.391
Soil containing ash (burn pit)	J195T8	9/8/2009	0.146	U	0.146	0.377	U	0.377	0.435	U	0.435

Sample Location	HEIS Number	Sample Date	Europium-155			Gross alpha			Gross beta		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	0.263	U	0.263	10.7		5.44	11		5.41
Soil (pipeline release)	J191C5	7/6/2009	0.274	U	0.274	13.2		2.85	18.9		5.25
Blue-green material	J19281	7/23/2009	0.021	U	0.021	2.72	U	3.05	4.83	U	5.26
Soil containing ash (burn pit)	J195T6	9/8/2009	0.13	U	0.13	5.89		4.31	18.9		4.93
Soil containing ash (burn pit)	J195T7	9/8/2009	0.353	U	0.353	5.88		4.42	19.9		5.66
Soil containing ash (burn pit)	J195T8	9/8/2009	0.29	U	0.29	5.74		4.84	15.8		8.38

Sample Location	HEIS Number	Sample Date	Niobium-94			Potassium-40			Radium-226		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil containing ash (8 ft bgs)	J18X02	5/14/2009				5.84		1.12	1.15		0.33
Soil (pipeline release)	J191C5	7/6/2009				13.2		0.702	0.53		0.134
Blue-green material	J19281	7/23/2009	0.005	U	0.005	2.96		0.058	0.14		0.014
Soil containing ash (burn pit)	J195T6	9/8/2009				15.4		0.38	0.712		0.088
Soil containing ash (burn pit)	J195T7	9/8/2009				13.8		1.34	0.586		0.258
Soil containing ash (burn pit)	J195T8	9/8/2009				13.9		1.11	0.49		0.265

Sample Location	HEIS Number	Sample Date	Radium-228			Silver-108m			Thorium-228 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	1.98		0.53	0.096	U	0.096	1.26		0.158
Soil (pipeline release)	J191C5	7/6/2009	0.606		0.343				0.795		0.098
Blue-green material	J19281	7/23/2009	0.215		0.028	0.005	U	0.005	0.206		0.009
Soil containing ash (burn pit)	J195T6	9/8/2009	0.95		0.211	0.035	U	0.035	0.944		0.059
Soil containing ash (burn pit)	J195T7	9/8/2009	1.19		0.583	0.106	U	0.106	0.521		0.182
Soil containing ash (burn pit)	J195T8	9/8/2009	0.883		0.657	0.11	U	0.11	0.64		0.19

Sample Location	HEIS Number	Sample Date	Thorium-232 GEA			Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil containing ash (8 ft bgs)	J18X02	5/14/2009	1.98		0.53	0.651	U	0.651	15.2	U	15.2
Soil (pipeline release)	J191C5	7/6/2009	0.606		0.343	0.377	U	0.377	9.14	U	9.14
Blue-green material	J19281	7/23/2009	0.215		0.028	0.042	U	0.042	1.44	U	1.44
Soil containing ash (burn pit)	J195T6	9/8/2009	0.95		0.211	0.279	U	0.279	5.87	U	5.87
Soil containing ash (burn pit)	J195T7	9/8/2009	1.19		0.583	0.719	U	0.719	16.4	U	16.4
Soil containing ash (burn pit)	J195T8	9/8/2009	0.883		0.657	0.721	U	0.721	16.1	U	16.1

Table B-4. 128-H-1 Inorganic Sample Results - Inorganics. (2 Pages)

Sample Location	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Arsenic TCLP			Barium			Barium TCLP		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
128-H-1 Area 1	J1J448	5/9/2011	8290		1.4	0.34	U	0.34	2.2	M	0.59				66.1		0.068			
128-H-1 Area 2	J1J449	5/9/2011	7110		1.3	0.32	U	0.32	1.7		0.55				54.9		0.064			
128-H-1 Area 3	J1J450	5/9/2011	8340		1.4	0.34	U	0.34	3.6		0.59				72.8		0.068			
128-H-1 Area 4	J1J451	5/9/2011	7630		1.5	0.36	U	0.36	3.6		0.62	0.033	B	0.022	68.3		0.072	0.77	B	0.002
128-H-1 Area 5	J1J452	5/9/2011	7420		1.4	0.34	U	0.34	4.4		0.58				58		0.067			
128-H-1 Area 6	J1J453	5/9/2011	5110		1.3	0.33	U	0.33	1.2		0.57				37.1		0.066			
128-H-1 Area 7	J1J454	5/9/2011	5270		1.5	0.36	U	0.36	1.3		0.62				40.5		0.072			
128-H-1 Area 8	J1J455	5/9/2011	5600		1.4	0.34	U	0.34	1.5		0.59				38.5		0.068			
128-H-1 Area 9	J1J456	5/9/2011	6140		1.4	0.34	U	0.34	1.4		0.59				42.8		0.068			

Sample Location	Sample Number	Sample Date	Beryllium			Boron			Cadmium			Cadmium TCLP			Calcium			Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
128-H-1 Area 1	J1J448	5/9/2011	0.1	B	0.03	0.97	B	0.88	0.12	B	0.04				4960		12.7	10		0.052
128-H-1 Area 2	J1J449	5/9/2011	0.028	U	0.028	0.88	B	0.82	0.095	B	0.03				4790		11.8	11.5		0.049
128-H-1 Area 3	J1J450	5/9/2011	0.12	B	0.03	1.5	B	0.88	0.11	B	0.04				4820		12.7	11.6		0.052
128-H-1 Area 4	J1J451	5/9/2011	0.12	B	0.031	1.4	B	0.92	0.13	B	0.04	0.002	U	0.002	5900		13.3	12.1		0.055
128-H-1 Area 5	J1J452	5/9/2011	0.087	B	0.029	1.1	B	0.86	0.11	B	0.04				4780		12.4	12.6		0.051
128-H-1 Area 6	J1J453	5/9/2011	0.029	U	0.029	0.85	U	0.85	0.065	B	0.04				3020		12.2	8.5		0.05
128-H-1 Area 7	J1J454	5/9/2011	0.031	U	0.031	0.92	U	0.92	0.091	B	0.04				4010		13.3	8.6		0.055
128-H-1 Area 8	J1J455	5/9/2011	0.03	U	0.03	0.88	U	0.88	0.071	B	0.04				3540		12.6	11.2		0.052
128-H-1 Area 9	J1J456	5/9/2011	0.029	U	0.029	0.87	U	0.87	0.071	B	0.04				3770		12.5	10.3		0.052

Acronyms and notes apply to all of the tables in this appendix.

B = estimated result

N = recovery exceeds upper or lower control limits

Q = qualifier

U = undetected

X = serial dilution in th eanalytical batch indicates that physical and chemial interferences are present

MDA = mimimum detectable activity

PQL = practical quantitation limit

Table B-4. 128-H-1 Inorganic Sample Results - Inorganics. (2 Pages)

Sample Location	Sample Number	Sample Date	Chromium TCLP			Cobalt			Copper			Iron			Lead			Lead TCLP		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
128-H-1 Area 1	J1J448	5/9/2011				7.1	X	0.09	17.7	X	0.2	16000		3.4	4.4		0.24			
128-H-1 Area 2	J1J449	5/9/2011				6.4	X	0.084	14.9	X	0.18	15600		3.2	3.8		0.23			
128-H-1 Area 3	J1J450	5/9/2011				6.7	X	0.09	15.5	X	0.2	16800		3.4	11.1		0.24			
128-H-1 Area 4	J1J451	5/9/2011	0.003	U	0.003	6.1	X	0.094	1770	X	0.2	15100		3.6	153		0.25	0.013	U	0.013
128-H-1 Area 5	J1J452	5/9/2011				5.9	X	0.088	13.5	X	0.19	15300		3.4	11.9		0.24			
128-H-1 Area 6	J1J453	5/9/2011				5.5	X	0.086	13.8	X	0.19	13400		3.3	2.3		0.23			
128-H-1 Area 7	J1J454	5/9/2011				5.7	X	0.094	14.3	X	0.2	13900		3.6	2.8		0.25			
128-H-1 Area 8	J1J455	5/9/2011				5.8	X	0.089	14.4	X	0.19	13800		3.4	2.8		0.24			
128-H-1 Area 9	J1J456	5/9/2011				5.8	X	0.089	15.6	X	0.19	13700		3.4	2.8		0.24			

Sample Location	Sample Number	Sample Date	Magnesium			Manganese			Mercury			Mercury TCLP			Molybdenum			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
128-H-1 Area 1	J1J448	5/9/2011	4440		3.3	260		0.09	0.007	B	0.01				0.42	B	0.23	11.3	X	0.11
128-H-1 Area 2	J1J449	5/9/2011	4520		3.1	251		0.084	0.006	U	0.01				0.22	U	0.22	11.3	X	0.1
128-H-1 Area 3	J1J450	5/9/2011	4560		3.3	270		0.09	0.007	B	0.01				0.23	U	0.23	11.1	X	0.11
128-H-1 Area 4	J1J451	5/9/2011	4480		3.5	254		0.094	0.005	U	0.01	3E-05	U	3E-05	0.24	U	0.24	14.7	X	0.12
128-H-1 Area 5	J1J452	5/9/2011	4450		3.3	240		0.088	0.005	U	0.01				0.23	U	0.23	11.1	X	0.11
128-H-1 Area 6	J1J453	5/9/2011	3990		3.2	205		0.086	0.005	U	0.01				0.22	U	0.22	10.2	X	0.11
128-H-1 Area 7	J1J454	5/9/2011	3750		3.5	213		0.094	0.005	U	0.01				0.25	U	0.25	9.1	X	0.12
128-H-1 Area 8	J1J455	5/9/2011	3960		3.3	218		0.089	0.006	U	0.01				0.23	U	0.23	9.7	X	0.11
128-H-1 Area 9	J1J456	5/9/2011	4290		3.3	228		0.089	0.005	U	0.01				0.23	U	0.23	10.8	X	0.11

Sample Location	Sample Number	Sample Date	Potassium			Selenium			Selenium TCLP			Silicon			Silver			Silver TCLP		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
128-H-1 Area 1	J1J448	5/9/2011	1010		36.9	0.77	U	0.77				368	N	5.1	0.14	U	0.14			
128-H-1 Area 2	J1J449	5/9/2011	992		34.4	0.72	U	0.72				247		4.8	0.13	U	0.13			
128-H-1 Area 3	J1J450	5/9/2011	1590		36.9	0.77	U	0.77				266		5.1	0.14	U	0.14			
128-H-1 Area 4	J1J451	5/9/2011	1510		38.6	0.81	U	0.81	0.024	U	0.02	269		5.3	0.15	U	0.15	0.006	BC	0.004
128-H-1 Area 5	J1J452	5/9/2011	1240		36.2	0.76	U	0.76				238		5	0.14	U	0.14			
128-H-1 Area 6	J1J453	5/9/2011	498		35.4	0.74	U	0.74				95.1		4.9	0.14	U	0.14			
128-H-1 Area 7	J1J454	5/9/2011	652		38.7	0.81	U	0.81				133		5.3	0.15	U	0.15			
128-H-1 Area 8	J1J455	5/9/2011	624		36.7	0.77	U	0.77				106		5.1	0.14	U	0.14			
128-H-1 Area 9	J1J456	5/9/2011	657		36.5	0.76	U	0.76				118		5	0.14	U	0.14			

Sample Location	Sample Number	Sample Date	Sodium			Vanadium			Zinc			% moisture (wet)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	%	Q	PQL
128-H-1 Area 1	J1J448	5/9/2011	296		53.1	35.9		0.085	32.7	X	0.36	0.74		0
128-H-1 Area 2	J1J449	5/9/2011	228		49.5	40.4		0.079	34	X	0.33	0.75		0
128-H-1 Area 3	J1J450	5/9/2011	214		53.1	38.1		0.085	39.5	X	0.36	0.75		0
128-H-1 Area 4	J1J451	5/9/2011	188		55.5	32.4		0.088	1030	X	0.37	0.7		0
128-H-1 Area 5	J1J452	5/9/2011	200		52	36.3		0.083	36.2	X	0.35	1.4		0
128-H-1 Area 6	J1J453	5/9/2011	171		51	38.6		0.081	29.6	X	0.34	1.9		0
128-H-1 Area 7	J1J454	5/9/2011	174		55.6	39.8		0.089	30.2	X	0.38	2.7		0
128-H-1 Area 8	J1J455	5/9/2011	203		52.8	40.3		0.084	30.9	X	0.36	1.9		0
128-H-1 Area 9	J1J456	5/9/2011	191		52.5	39.2		0.084	29.6	X	0.35	0.5		0

Table B-5. 128-H-1 Water Sample at Bottom of West Excavation (Metals).

Sample Location	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	90.3		50	15	U	15	4.61	B	10	12.7		2	1	U	1

Sample Location	Sample Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	24.2		10	1	U	1	16600		100	23.8		2	2	U	2

Sample Location	Sample Number	Sample Date	Copper			Hexavalent			Iron			Lead			Magnesium		
			ug/L	Q	PQL	mg/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	5.29	B	10				96		50	10	U	10	4810		100
Excavation Water Sample	J19J61	2/4/2010				0.017		0.0037									

Sample Location	Sample Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	7.38		2	0.2	U	0.2	3.52		2	5	U	5	3320		500

Sample Location	Sample Number	Sample Date	Selenium			Silicon			Silver			Sodium			Strontium		
			ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	10	U	10	1800		50	5	U	5	9240		100	110		5

Sample Location	Sample Number	Sample Date	Thallium			Tin			Vanadium			Zinc			Bromide		
			ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	ug/L	Q	PQL	mg/L	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	5	U	5	4.18	B	5	7.48		5	9.67	B	20	0.25	U	0.25

Sample Location	Sample Number	Sample Date	Chloride			Flouride			Nitrate			Nitrite			Phosphate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Excavation Water Sample	J19J60	2/4/2010	9.32	D	1	0.14	B	0.25	7.42		0.25	0.25	U	0.25	0.5	U	0.5

Sample Location	Sample Number	Sample Date	Sulfate			pH
			mg/kg	Q	PQL	pH Units
Excavation Water Sample	J19J60	2/4/2010	35.9	D	1.25	8.79

Acronyms and notes apply to all of the tables in this appendix.

B = Analyte found in the associated blank as well as in the ssample. It indicates possible/probable blank contamination.

D = Compound identified in an analysis at a secondary dilution factor.

Q = qualifier

PQL = practical quantitation limit

U = Undetected

Table B-6. 128-H-1 West Excavation Water Sample (Organics).

Constituent	J19J60		
	2/4/2010		
	mg/kg	Q	PQL
Herbicides			
2-(2,4,5-Trichlorophenoxy)propionic acid	0.5	U	0.5
2,4,5-Trichlorophenoxyacetic acid	0.5	U	0.5
2,4-Dichlorophenoxyacetic acid	0.5	U	0.5
2-secButyl-4,6-dinitrophenol(DNBP)	0.5	U	0.5
4-(2,4-Dichlorophenoxy)butanoic acid	0.5	U	0.5
Dalapon	0.5	U	0.5
Dicamba	0.5	U	0.5
Dichloroprop	0.5	U	0.5
PCBs			
Aroclor-1016	0.4	U	0.4
Aroclor-1221	0.4	U	0.4
Aroclor-1232	0.4	U	0.4
Aroclor-1242	0.4	U	0.4
Aroclor-1248	0.4	U	0.4
Aroclor-1254	0.4	U	0.4
Aroclor-1260	0.4	U	0.4
Pesticides			
2-4' DDT	0.05	U	0.05
Aldrin	0.05	U	0.05
Alpha-BHC	0.05	U	0.05
alpha-Chlordane	0.05	U	0.05
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.05	U	0.05
Delta-BHC	0.05	U	0.05
Dichlorodiphenyldichloroethane	0.05	U	0.05
Dichlorodiphenyldichloroethylene	0.05	U	0.05
Dieldrin	0.05	U	0.05
Endosulfan I	0.05	U	0.05
Endosulfan II	0.05	U	0.05
Endosulfan sulfate	0.05	U	0.05
Endrin	0.05	U	0.05
Endrin aldehyde	0.05	U	0.05
Endrin ketone	0.05	U	0.05
Gamma-BHC (Lindane)	0.05	U	0.05
gamma-Chlordane	0.05	U	0.05
Heptachlor	0.05	U	0.05
Heptachlor epoxide	0.05	U	0.05
Methoxychlor	0.05	U	0.05
Toxaphene	0.5	U	0.5
SVOAs			
Acenaphthene	0.1	U	0.1
Acenaphthylene	0.1	U	0.1
Anthracene	0.1	U	0.1
Benzo(a)anthracene	0.1	U	0.1
Benzo(a)pyrene	0.1	U	0.1
Benzo(b)fluoranthene	0.1	U	0.1
Benzo(ghi)perylene	0.1	U	0.1
Benzo(k)fluoranthene	0.1	U	0.1
Chrysene	0.1	U	0.1
Dibenz[a,h]anthracene	0.1	U	0.1
Fluoranthene	0.1	U	0.1
Fluorene	0.1	U	0.1
Indeno(1,2,3-cd)pyrene	0.1	U	0.1
Naphthalene	0.1	U	0.1
Phenanthrene	0.1	U	0.1
Pyrene	0.1	U	0.1

APPENDIX C

ORIGINAL BURN PIT

Table C-1. 128-H-1 Original Deep Zone Inorganic Sample Results - Inorganics. (3 Pages)

Sample Location	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-1	J1B8C9	6/16/10	6160		15.1	0.394	B	0.76	2.49		0.76	52.8		0.38	0.174		0.15
E-2	J1B8D0	6/16/10	5440		13.5	0.314	B	0.68	2.07		0.68	43.3		0.34	0.137		0.14
E-3	J1B8D1	6/16/10	7290		14.1	0.578	B	0.7	2.29		0.7	61.6		0.35	0.207		0.14
E-4	J1B8D2	6/16/10	5300		16.4	0.347	B	0.82	2.99		0.82	48.7		0.41	0.144	B	0.16
E-5	J1B8D3	6/16/10	5910		13.2	0.386	B	0.66	2.28		0.66	71.9		0.33	0.162		0.13
E-6	J1B8D4	6/16/10	5750		14.8	0.229	B	0.74	2.01		0.74	52.1		0.37	0.154		0.15
E-7	J1B8D5	6/16/10	8540		16.2	5.44		0.81	3.85		0.81	170		0.4	0.185		0.16
E-8	J1B8D6	6/16/10	5850		15.5	0.268	B	0.77	3.23		0.77	77.4		0.39	0.159		0.16
E-9	J1B8D7	6/16/10	6970		14.7	1.78		0.73	4.79		0.73	90.3		0.37	0.186		0.15
E-10	J1B8D8	6/16/10	6960		17.7	0.337	B	0.88	3.45		0.88	57.2		0.44	0.213		0.18
E-11	J1B8D9	6/16/10	7100		14	0.271	B	0.7	8.74		0.7	62.4		0.35	0.21		0.14
E-12	J1B8F0	6/16/10	7120		17.6	0.882	U	0.88	4.81		0.88	48.9		0.44	0.204		0.18
E-5 Duplicate	J1B8F1	6/16/10	5230		19.2	0.381	B	0.96	1.88		0.96	71.1		0.48	0.175	B	0.19

Sample Location	Sample Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-1	J1B8C9	6/16/10	1.1	B	1.51	0.084	B	0.19	4590		15.1	10.8		0.76	5.26		2.27
E-2	J1B8D0	6/16/10	0.693	B	1.35	0.072	B	0.17	3410		13.5	9.48		0.68	5.47		2.03
E-3	J1B8D1	6/16/10	2.48		1.41	0.262		0.18	4340		14.1	12.5		0.7	5.39		2.11
E-4	J1B8D2	6/16/10	1.13	B	1.64	0.071	B	0.21	3480		16.4	8.57		0.82	5.22		2.46
E-5	J1B8D3	6/16/10	2.72		1.32	0.081	B	0.17	4090		13.2	11.6		0.66	5.51		1.99
E-6	J1B8D4	6/16/10	0.766	B	1.48	0.084	B	0.19	3570		14.8	8.53		0.74	5.35		2.22
E-7	J1B8D5	6/16/10	11.6		1.62	4.44		0.2	7760		16.2	212		0.81	12.9		2.42
E-8	J1B8D6	6/16/10	0.802	B	1.55	0.09	B	0.19	3150		15.5	9.42		0.77	5.2		2.32
E-9	J1B8D7	6/16/10	3.56		1.47	1.82		0.18	3800		14.7	36.7		0.73	6.32		2.2
E-10	J1B8D8	6/16/10	1.34	B	1.77	0.137	B	0.22	4340		17.7	12.7		0.88	5.53		2.65
E-11	J1B8D9	6/16/10	1.16	B	1.4	0.103	B	0.17	3410		14	10.9		0.7	5.13		2.09
E-12	J1B8F0	6/16/10	1.24	B	1.76	0.082	B	0.22	5110		17.6	12.9		0.88	5.29		2.65
E-5 Duplicate	J1B8F1	6/16/10	3.22		1.92	0.076	B	0.24	3800		19.2	8.62		0.96	4.71		2.88

Acronyms and notes apply to all of the tables in this appendix.

B = analyte is found in the associated blank as well as the sample and indicates possible/probable blank contamination

D = identifies all compounds identified in an analysis at a secondary dilution factor

J = indicates an estimated value

Q = qualifier

U = undetected

MDA = mimimum detectable activity

PQL = practical quantitation limit

Table C-1. 128-H-1 Original Deep Zone Inorganic Sample Results - Inorganics. (3 Pages)

Sample Location	Sample Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-1	J1B8C9	6/16/10	13		1.51	0.13	B	0.2	16000		15.1	6.75		0.76	3980		3.78
E-2	J1B8D0	6/16/10	12.9		1.35	0.07	B	0.2	15500		13.5	4.03		0.68	3520		3.38
E-3	J1B8D1	6/16/10	18.7		1.41	0.22		0.21	16600		14.1	11.1		0.7	3930		3.52
E-4	J1B8D2	6/16/10	12.5		1.64	0.16	B	0.2	14600		16.4	3.98		0.82	3850		4.1
E-5	J1B8D3	6/16/10	16.7		1.32	0.09	B	0.21	15100		13.2	3.57		0.66	4000		3.31
E-6	J1B8D4	6/16/10	13		1.48	0.2	U	0.2	15700		14.8	3.9		0.74	3770		3.69
E-7	J1B8D5	6/16/10	307		1.62	0.2	U	0.2	24300		16.2	4340		0.81	4140		4.04
E-8	J1B8D6	6/16/10	12.9		1.55	0.08	B	0.2	14400		15.5	4.48		0.77	3430		3.86
E-9	J1B8D7	6/16/10	99.6		1.47	0.53		0.21	21800		14.7	102		0.73	4190		3.66
E-10	J1B8D8	6/16/10	23.1		1.77	0.2	B	0.2	15700		17.7	10.8		0.88	3960		4.41
E-11	J1B8D9	6/16/10	12.4		1.4	0.15	B	0.2	15800		14	26.7		0.7	3600		3.49
E-12	J1B8F0	6/16/10	13.7		1.76	0.11	B	0.2	15500		17.6	11.8		0.88	4060		4.41
E-5 Duplicate	J1B8F1	6/16/10	13.1		1.92	0.09	B	0.24	13600		19.2	3.51		0.96	3250		4.8

Sample Location	Sample Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-1	J1B8C9	6/16/10	241		0.76	0.028	U	0.03	0.293	B	0.76	9.71		1.89	809		75.5
E-2	J1B8D0	6/16/10	213		0.68	0.029	U	0.03	0.287	B	0.68	8.43		1.69	551		67.6
E-3	J1B8D1	6/16/10	295		0.7	0.094		0.03	0.451	B	0.7	10.5		1.76	1020		70.3
E-4	J1B8D2	6/16/10	201		0.82	0.025	U	0.02	0.193	B	0.82	13.2		2.05	714		82
E-5	J1B8D3	6/16/10	216		0.66	0.027	U	0.03	0.395	B	0.66	10.7		1.65	528		66.2
E-6	J1B8D4	6/16/10	223		0.74	0.025	U	0.02	0.251	B	0.74	8.81		1.85	663		73.8
E-7	J1B8D5	6/16/10	381		0.81	1.61		0.08	19.7		0.81	148		2.02	1010		80.8
E-8	J1B8D6	6/16/10	231		0.77	0.024	U	0.02	0.261	B	0.77	8.13		1.93	679		77.3
E-9	J1B8D7	6/16/10	363		0.73	0.175		0.03	3.05		0.73	20.5		1.83	995		73.3
E-10	J1B8D8	6/16/10	242		0.88	0.013	B	0.03	0.265	B	0.88	10.7		2.21	944		88.3
E-11	J1B8D9	6/16/10	219		0.7	0.025	U	0.03	0.23	B	0.7	9.41		1.74	932		69.8
E-12	J1B8F0	6/16/10	215		0.88	0.029	U	0.03	0.882	U	0.88	10.1		2.21	880		88.2
E-5 Duplicate	J1B8F1	6/16/10	197		0.96	0.03	U	0.03	0.256	B	0.96	9.28		2.4	573		96

Table C-1. 128-H-1 Original Deep Zone Inorganic Sample Results - Inorganics. (3 Pages)

Sample Location	Sample Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL									
E-1	J1B8C9	6/16/10	0.227	U	0.23	292		4.53	0.755	U	0.76	208		37.8	44.1		0.76
E-2	J1B8D0	6/16/10	0.203	U	0.2	225		4.06	0.676	U	0.68	207		33.8	46.4		0.68
E-3	J1B8D1	6/16/10	0.211	U	0.21	365		4.22	0.169	B	0.7	213		35.2	43.7		0.7
E-4	J1B8D2	6/16/10	0.246	U	0.25	235		4.92	0.82	U	0.82	232		41	41.4		0.82
E-5	J1B8D3	6/16/10	0.199	U	0.2	246		3.97	0.662	U	0.66	221		33.1	43.3		0.66
E-6	J1B8D4	6/16/10	0.222	U	0.22	463		4.43	0.738	U	0.74	196		36.9	46.3		0.74
E-7	J1B8D5	6/16/10	0.242	U	0.24	400		4.85	2.28		0.81	348		40.4	47.5		0.81
E-8	J1B8D6	6/16/10	0.232	U	0.23	257		4.64	0.773	U	0.77	187		38.6	42.9		0.77
E-9	J1B8D7	6/16/10	0.22	U	0.22	309		4.4	0.733	U	0.73	209		36.6	46.5		0.73
E-10	J1B8D8	6/16/10	0.265	U	0.27	418		5.3	0.883	U	0.88	194		44.1	39.9		0.88
E-11	J1B8D9	6/16/10	0.209	U	0.21	345		4.19	0.698	U	0.7	181		34.9	42		0.7
E-12	J1B8F0	6/16/10	0.265	U	0.27	425		5.29	0.882	U	0.88	208		44.1	42		0.88
E-5 Duplicate	J1B8F1	6/16/10	0.288	U	0.29	332		5.76	0.96	U	0.96	206		48	39.7		0.96

Sample Location	Sample Number	Sample Date	Zinc			TPH - diesel range			TPH - motor oil (HB)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-1	J1B8C9	6/16/10	34.5		2.27	3370	U	3370	10100	U	10100
E-2	J1B8D0	6/16/10	30.7		2.03	3380	U	3380	3830	J	10100
E-3	J1B8D1	6/16/10	56.3		2.11	17100	U	17100	1050000	D	51300
E-4	J1B8D2	6/16/10	29.8		2.46	3390	U	3390	9170	J	10200
E-5	J1B8D3	6/16/10	31.6		1.99	3440	U	3440	5010	J	10300
E-6	J1B8D4	6/16/10	31.1		2.22	3400	U	3400	10200	U	10200
E-7	J1B8D5	6/16/10	607		2.42	3390	U	3390	77700		10200
E-8	J1B8D6	6/16/10	30.9		2.32	3400	U	3400	10200	U	10200
E-9	J1B8D7	6/16/10	349		2.2	3470	U	3470	26000		10400
E-10	J1B8D8	6/16/10	57		2.65	3410	U	3410	53900		10200
E-11	J1B8D9	6/16/10	33.9		2.09	3350	U	3350	3660	J	10100
E-12	J1B8F0	6/16/10	32.3		2.65	3410	U	3410	10200	U	10200
E-5 Duplicate	J1B8F1	6/16/10	30.5		2.88	3970	U	3970	11900	U	11900

Table C-2. 128-H-1 Original Deep Zone Organic Sample Results - Organics. (4 Pages)

Constituent	J1B8C9 E-1			J1B8D0 E-2			J1B8D1 E-3			J1B8D2 E-4			J1B8D3 E-5			J1B8D4 E-6			J1B8D5 E-7		
	6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAH																					
Acenaphthene	3.29	U	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	58.3		3.34	3.29	U	3.29	3.21	U	3.21
Acenaphthylene	3.29	U	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	3.34	U	3.34	3.29	U	3.29	3.21	U	3.21
Anthracene	3.99		3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	0.92	J	3.34	3.29	U	3.29	1.03	J	3.21
Benzo(a)anthracene	2.16	J	3.29	3.08	U	3.08	3.34	U	3.34	0.96	J	3.31	4.94		3.34	3.29	U	3.29	11.1		3.21
Benzo(a)pyrene	2.95	J	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	3.34	U	3.34	3.29	U	3.29	15.8		3.21
Benzo(b)fluoranthene	2.39	J	3.29	3.08	U	3.08	1	J	3.34	0.828	J	3.31	2.38	J	3.34	3.29	U	3.29	23.9		3.21
Benzo(ghi)perylene	1.4	J	3.29	3.08	U	3.08	2.46	J	3.34	3.31	U	3.31	3.34	U	3.34	3.29	U	3.29	14.9		3.21
Benzo(k)fluoranthene	1.17	J	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	3.34	U	3.34	2.06	J	3.29	8.56		3.21
Chrysene	0.972	J	3.29	3.08	U	3.08	1.1	J	3.34	3.31	U	3.31	23		3.34	3.29	U	3.29	2.03	J	3.21
Dibenz[a,h]anthracene	3.29	U	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	3.34	U	3.34	3.29	U	3.29	1.9	J	3.21
Fluoranthene	8.73		3.29	3.08	U	3.08	3.34	U	3.34	1.42	J	3.31	21.5		3.34	3.29	U	3.29	50		3.21
Fluorene	1.53	J	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	12.9		3.34	3.29	U	3.29	3.21	U	3.21
Indeno(1,2,3-cd)pyrene	1.84	J	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	3.34	U	3.34	3.29	U	3.29	18.7		3.21
Naphthalene	3.29	U	3.29	3.08	U	3.08	3.34	U	3.34	3.31	U	3.31	10.6		3.34	3.29	U	3.29	3.21	U	3.21
Phenanthrene	4.18		3.29	3.08	U	3.08	3.34	U	3.34	1.11	J	3.31	9.07		3.34	3.29	U	3.29	19.9		3.21
Pyrene	4.45		3.29	3.08	U	3.08	1.52	J	3.34	3.31	U	3.31	3.34	U	3.34	3.29	U	3.29	5.15		3.21
PCBs																					
Aroclor-1016	13.3	U	13.3	12.7	U	12.7	13.5	U	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	51.8	U	51.8
Aroclor-1221	13.3	U	13.3	12.7	U	12.7	13.5	U	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	51.8	U	51.8
Aroclor-1232	13.3	U	13.3	12.7	U	12.7	13.5	U	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	51.8	U	51.8
Aroclor-1242	13.3	U	13.3	12.7	U	12.7	13.5	U	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	51.8	U	51.8
Aroclor-1248	13.3	U	13.3	12.7	U	12.7	13.5	U	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	51.8	U	51.8
Aroclor-1254	13.3	U	13.3	12.7	U	12.7	12.7	J	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	474	D	51.8
Aroclor-1260	13.3	U	13.3	12.7	U	12.7	5.42	J	13.5	13.2	U	13.2	13.7	U	13.7	13.3	U	13.3	69.4	D	51.8
Pesticides																					
Aldrin	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Alpha-BHC	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
alpha-Chlordane	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
beta-1,2,3,4,5,6-	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	2.6	JD	2.6
Delta-BHC	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Dichlorodiphenyldichloroethane	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Dichlorodiphenyldichloroethylene	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	21.7	D	21.7
Dichlorodiphenyltrichloroethane	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Dieldrin	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Endosulfan I	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Endosulfan II	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Endosulfan sulfate	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Endrin	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Endrin aldehyde	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Endrin ketone	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Gamma-BHC (Lindane)	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
gamma-Chlordane	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Heptachlor	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Heptachlor epoxide	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Methoxychlor	1.33	UD	1.33	1.27	U	1.27	1.35	U	1.35	1.32	U	1.32	1.38	U	1.38	1.33	U	1.33	1.3	U	1.3
Toxaphene	19.9	UD	19.9	19.1	U	19.1	20.3	U	20.3	19.8	U	19.8	20.6	U	20.6	20	U	20	19.5	U	19.5
SVOAs																					
1,2,4-Trichlorobenzene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
1,2-Dichlorobenzene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
1,3-Dichlorobenzene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
1,4-Dichlorobenzene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2,4,5-Trichlorophenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2,4,6-Trichlorophenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663

Table C-2. 128-H-1 Original Deep Zone Organic Sample Results - Organics. (4 Pages)

Constituent	J1B8C9 E-1			J1B8D0 E-2			J1B8D1 E-3			J1B8D2 E-4			J1B8D3 E-5			J1B8D4 E-6			J1B8D5 E-7		
	6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs																					
2,4-Dichlorophenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2,4-Dimethylphenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2,4-Dinitrophenol	1470	U	1470	1520	U	1520	4860	U	4860	1570	U	1570	1640	U	1640	1570	U	1570	3310	U	3310
2,4-Dinitrotoluene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2,6-Dinitrotoluene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2-Chloronaphthalene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2-Chlorophenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2-Methylnaphthalene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2-Methylphenol (cresol, o-)	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
2-Nitroaniline	1470	U	1470	1520	U	1520	4860	U	4860	1570	U	1570	1640	U	1640	1570	U	1570	3310	U	3310
2-Nitrophenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
3+4 Methylphenol (cresol, m+p)	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
3,3'-Dichlorobenzidine	587	U	587	608	U	608	1940	U	1940	630	U	630	658	U	658	628	U	628	1330	U	1330
3-Nitroaniline	1470	U	1470	1520	U	1520	4860	U	4860	1570	U	1570	1640	U	1640	1570	U	1570	3310	U	3310
4,6-Dinitro-2-methylphenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
4-Bromophenylphenyl ether	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
4-Chloro-3-methylphenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
4-Chloroaniline	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
4-Chlorophenylphenyl ether	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
4-Nitroaniline	1470	U	1470	1520	U	1520	4860	U	4860	1570	U	1570	1640	U	1640	1570	U	1570	3310	U	3310
4-Nitrophenol	1470	U	1470	1520	U	1520	4860	U	4860	1570	U	1570	1640	U	1640	1570	U	1570	3310	U	3310
Acenaphthene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Acenaphthylene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Anthracene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Benzo(a)anthracene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Benzo(a)pyrene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Benzo(b)fluoranthene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Benzo(ghi)perylene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	108	JD	663
Benzo(k)fluoranthene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Bis(2-chloro-1-methylethyl)ether	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Bis(2-Chloroethoxy)methane	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Bis(2-chloroethyl) ether	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Bis(2-ethylhexyl) phthalate	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	258	JD	663
Butylbenzylphthalate	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Carbazole	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Chrysene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Di-n-butylphthalate	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Di-n-octylphthalate	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Dibenz[a,h]anthracene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Dibenzofuran	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Diethyl phthalate	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Dimethyl phthalate	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Fluoranthene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Fluorene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Hexachlorobenzene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Hexachlorobutadiene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Hexachlorocyclopentadiene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Hexachloroethane	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Indeno(1,2,3-cd)pyrene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Isophorone	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
N-Nitroso-di-n-dipropylamine	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
N-Nitrosodiphenylamine	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Naphthalene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Nitrobenzene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Pentachlorophenol	1470	U	1470	1520	U	1520	4860	U	4860	1570	U	1570	1640	U	1640	1570	U	1570	3310	U	3310
Phenanthrene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Phenol	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663
Pyrene	294	U	294	304	U	304	972	U	972	315	U	315	329	U	329	314	U	314	663	U	663

Table C-2. 128-H-1 Original Deep Zone Organic Sample Results - Organics. (4 Pages)

Constituent	J1B8D6 E-8			J1B8D7 E-9			J1B8D8 E-10			J1B8D9 E-11			J1B8F0 E-12			J1B8F1 Dup		
	6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAH																		
Acenaphthene	3.31	U	3.31	3.3	U	3.3	3.25	U	3.25	3.21	U	3.21	3.19	U	3.19	3.77	U	3.77
Acenaphthylene	3.31	U	3.31	3.3	U	3.3	3.25	U	3.25	3.21	U	3.21	3.19	U	3.19	3.77	U	3.77
Anthracene	3.31	U	3.31	2.18	J	3.3	3.25	U	3.25	3.21	U	3.21	3.19	U	3.19	3.77	U	3.77
Benzo(a)anthracene	4.19		3.31	10.5		3.3	1.02	J	3.25	6.31		3.21	3.19	U	3.19	3.77	U	3.77
Benzo(a)pyrene	3.42		3.31	20.3		3.3	1.4	J	3.25	7.93		3.21	3.19	U	3.19	3.77	U	3.77
Benzo(b)fluoranthene	2.98	J	3.31	16.6		3.3	3.25	U	3.25	7.92		3.21	3.19	U	3.19	3.77	U	3.77
Benzo(ghi)perylene	1.24	J	3.31	23.4		3.3	0.943	J	3.25	4.55		3.21	3.19	U	3.19	3.77	U	3.77
Benzo(k)fluoranthene	1.24	J	3.31	7.69		3.3	3.25	U	3.25	3.4		3.21	3.19	U	3.19	3.77	U	3.77
Chrysene	3.31	U	3.31	5.57		3.3	3.25	U	3.25	2.38	J	3.21	3.19	U	3.19	3.77	U	3.77
Dibenz[a,h]anthracene	3.31	U	3.31	3.41		3.3	3.25	U	3.25	3.21	U	3.21	3.19	U	3.19	3.77	U	3.77
Fluoranthene	11.4		3.31	24.2		3.3	2.63	J	3.25	16		3.21	3.19	U	3.19	9.16		3.77
Fluorene	3.31	U	3.31	3.3	U	3.3	3.25	U	3.25	3.21	U	3.21	3.19	U	3.19	3.77	U	3.77
Indeno(1,2,3-cd)pyrene	2.08	J	3.31	24.9		3.3	3.25	U	3.25	5.11		3.21	3.19	U	3.19	3.77	U	3.77
Naphthalene	3.31	U	3.31	8.02		3.3	3.25	U	3.25	3.21	U	3.21	3.19	U	3.19	3.77	U	3.77
Phenanthrene	4.7		3.31	11.8		3.3	1.48	J	3.25	5.64		3.21	3.19	U	3.19	3.17	J	3.77
Pyrene	6.3		3.31	10.3		3.3	3.25	U	3.25	12.5		3.21	3.19	U	3.19	3.77	U	3.77
PCBs																		
Aroclor-1016	13.3	U	13.3	55.3	U	55.3	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Aroclor-1221	13.3	U	13.3	55.3	U	55.3	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Aroclor-1232	13.3	U	13.3	55.3	U	55.3	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Aroclor-1242	13.3	U	13.3	55.3	U	55.3	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Aroclor-1248	13.3	U	13.3	55.3	U	55.3	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Aroclor-1254	13.3	U	13.3	669	D	55.3	56.5		13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Aroclor-1260	13.3	U	13.3	133	D	55.3	9.1	J	13.2	13.3	U	13.3	13.6	U	13.6	15.7	U	15.7
Pesticides																		
Aldrin	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Alpha-BHC	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
alpha-Chlordane	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
beta-1,2,3,4,5,6-	1.33	UD	1.33	1.87	J	1.87	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Delta-BHC	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Dichlorodiphenyldichloroethane	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Dichlorodiphenyldichloroethylene	1.33	UD	1.33	32.6	D	32.6	1.89	JD	1.89	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Dichlorodiphenyltrichloroethane	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Dieldrin	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Endosulfan I	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Endosulfan II	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Endosulfan sulfate	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Endrin	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Endrin aldehyde	1.33	UD	1.33	1.73	J	1.73	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Endrin ketone	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Gamma-BHC (Lindane)	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
gamma-Chlordane	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Heptachlor	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Heptachlor epoxide	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Methoxychlor	1.33	UD	1.33	1.38	U	1.38	1.32	U	1.32	1.33	U	1.33	1.36	U	1.36	1.57	U	1.57
Toxaphene	20	UD	20	20.8	U	20.8	19.9	U	19.9	20	U	20	20.4	U	20.4	23.5	U	23.5
SVOAs																		
1,2,4-Trichlorobenzene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
1,2-Dichlorobenzene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
1,3-Dichlorobenzene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
1,4-Dichlorobenzene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2,4,5-Trichlorophenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2,4,6-Trichlorophenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367

Table C-2. 128-H-1 Original Deep Zone Organic Sample Results - Organics. (4 Pages)

Constituent	J1B8D6 E-8			J1B8D7 E-9			J1B8D8 E-10			J1B8D9 E-11			J1B8F0 E-12			J1B8F1 Dup		
	6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011			6/16/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs																		
2,4-Dichlorophenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2,4-Dimethylphenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2,4-Dinitrophenol	1650	U	1650	1620	U	1620	1640	U	1640	1610	U	1610	1600	U	1600	1830	U	1830
2,4-Dinitrotoluene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2,6-Dinitrotoluene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2-Chloronaphthalene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2-Chlorophenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2-Methylnaphthalene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2-Methylphenol (cresol, o-)	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
2-Nitroaniline	1650	U	1650	1620	U	1620	1640	U	1640	1610	U	1610	1600	U	1600	1830	U	1830
2-Nitrophenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
3+4 Methylphenol (cresol, m+p)	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
3,3'-Dichlorobenzidine	661	U	661	649	U	649	656	U	656	646	U	646	639	U	639	734	U	734
3-Nitroaniline	1650	U	1650	1620	U	1620	1640	U	1640	1610	U	1610	1600	U	1600	1830	U	1830
4,6-Dinitro-2-methylphenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
4-Bromophenylphenyl ether	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
4-Chloro-3-methylphenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
4-Chloroaniline	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
4-Chlorophenylphenyl ether	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
4-Nitroaniline	1650	U	1650	1620	U	1620	1640	U	1640	1610	U	1610	1600	U	1600	1830	U	1830
4-Nitrophenol	1650	U	1650	1620	U	1620	1640	U	1640	1610	U	1610	1600	U	1600	1830	U	1830
Acenaphthene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Acenaphthylene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Anthracene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Benzo(a)anthracene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Benzo(a)pyrene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Benzo(b)fluoranthene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Benzo(ghi)perylene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Benzo(k)fluoranthene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Bis(2-chloro-1-methylethyl)ether	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Bis(2-Chloroethoxy)methane	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Bis(2-chloroethyl) ether	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Bis(2-ethylhexyl) phthalate	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Butylbenzylphthalate	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Carbazole	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Chrysene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Di-n-butylphthalate	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Di-n-octylphthalate	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Dibenz[a,h]anthracene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Dibenzofuran	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Diethyl phthalate	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Dimethyl phthalate	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Fluoranthene	330	U	330	104	J	325	328	U	328	323	U	323	320	U	320	367	U	367
Fluorene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Hexachlorobenzene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Hexachlorobutadiene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Hexachlorocyclopentadiene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Hexachloroethane	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Indeno(1,2,3-cd)pyrene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Isophorone	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
N-Nitroso-di-n-dipropylamine	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
N-Nitrosodiphenylamine	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Naphthalene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Nitrobenzene	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Pentachlorophenol	1650	U	1650	1620	U	1620	1640	U	1640	1610	U	1610	1600	U	1600	1830	U	1830
Phenanthrene	330	U	330	109	J	325	328	U	328	323	U	323	320	U	320	367	U	367
Phenol	330	U	330	325	U	325	328	U	328	323	U	323	320	U	320	367	U	367
Pyrene	330	U	330	100	J	325	328	U	328	323	U	323	320	U	320	367	U	367

APPENDIX D

GROUNDWATER MONITORING RESULTS

Table D-1. Groundwater Monitoring Results. (5 Pages)

Sample Date	Well Number	Constituent	Result	Units	Standard Reporting Limit	Reporting Limit Type	Required Detection Limit	Dilution Factor	Lab Qualifier	Sample Number	Filtered?
03/30/10	699-97-41	Aroclor-1254	0.09	ug/L	0.09	MDL		1	U	B24HP2	N
03/31/10	199-H1-43	Aroclor-1254	0.09	ug/L	0.09	MDL		1	U	B24HM4	N
03/30/10	699-97-41	Aroclor-1260	0.09	ug/L	0.09	MDL		1	U	B24HP2	N
03/31/10	199-H1-43	Aroclor-1260	0.09	ug/L	0.09	MDL		1	U	B24HM4	N
07/30/08	699-99-41	Cadmium	4.3	ug/L	4	MDL		1		B1VKB0	Y
04/25/08	699-99-41	Cadmium	0.45	ug/L	0.45	MDL	5	1	U	B1THW0	Y
04/25/08	699-99-41	Cadmium	0.45	ug/L	0.45	MDL	5	1	U	B1THW1	N
02/13/08	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B1RB84	N
11/07/08	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B1X5K4	Y
12/01/09	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B22LH0	Y
03/02/11	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B29370	N
03/02/11	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B29372	N
11/07/08	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B1X5K5	N
03/02/11	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B29369	Y
12/01/09	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B22LH1	N
03/02/11	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B29371	Y
02/13/08	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B1RB83	Y
07/30/08	699-99-41	Cadmium	4	ug/L	4	MDL		1	U	B1VKB1	N
11/16/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B283K6	N
03/30/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B24HP2	N
11/04/08	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B1X5D1	Y
11/04/08	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B1X5D2	N
05/17/10	699-97-41	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B25875	N
05/17/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B25875	N
05/17/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B25874	Y
10/09/09	699-97-41	Cadmium	0.1	ug/L	0.1	MDL		1	U	B225V5	Y
03/21/10	699-97-41	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B23W63	N
10/09/09	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B221P9	Y
05/17/10	699-97-41	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B25874	Y
02/08/08	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B1RB53	Y
02/08/08	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B1RB54	N
03/30/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B24HP1	Y
10/09/09	699-97-41	Cadmium	0.1	ug/L	0.1	MDL		1	U	B225V6	N
03/21/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B23W62	Y
03/21/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B23W63	N
10/09/09	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B221R0	N
11/16/10	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B283K5	Y
07/28/08	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B1VK62	Y
07/28/08	699-97-41	Cadmium	4	ug/L	4	MDL		1	U	B1VK63	N
03/21/10	699-97-41	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B23W62	Y
04/25/08	699-97-41	Cadmium	0.45	ug/L	0.45	MDL	5	1	U	B1TJ17	Y
04/25/08	699-97-41	Cadmium	0.45	ug/L	0.45	MDL	5	1	U	B1TJ18	N
05/20/10	199-H1-38	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B22Y20	N
05/18/10	199-H1-40	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B22Y24	N
10/02/09	199-H1-42	Cadmium	4	ug/L	4	MDL		1	U	B21N97	N
10/02/09	199-H1-42	Cadmium	4	ug/L	4	MDL		1	U	B21N98	N
10/02/09	199-H1-42	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B21N97	N
10/02/09	199-H1-42	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B21N98	N
05/17/10	199-H1-39	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B22Y28	N
09/28/09	199-H1-45	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B21NB2	N
09/28/09	199-H1-45	Cadmium	4	ug/L	4	MDL		1	U	B21NB2	N
03/31/10	199-H1-43	Cadmium	4	ug/L	4	MDL		1	U	B24HM3	Y
10/02/09	199-H1-43	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B21NB9	N
03/31/10	199-H1-43	Cadmium	4	ug/L	4	MDL		1	U	B24HM4	N
10/02/09	199-H1-43	Cadmium	4	ug/L	4	MDL		1	U	B21NB9	N
02/16/11	199-H2-1	Cadmium	1	ug/L				1	U	B29M07	Y
02/25/11	199-H2-1	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B29HR6	N
02/22/11	199-H2-1	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B29HR4	N
02/16/11	199-H2-1	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B29HW8	N
02/16/11	199-H2-1	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B29HW9	N
02/17/11	199-H2-1	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B29HR3	N
02/24/11	199-H2-1	Cadmium	0.2	ug/L	0.2	MDL		2	UD	B29HR5	N
07/30/08	699-99-41	Chromium	19	ug/L	13	MDL		1		B1VKB0	Y
04/25/08	699-99-41	Chromium	58.2	ug/L	3.1	MDL	10	1		B1THW0	Y
04/25/08	699-99-41	Chromium	68.2	ug/L	3.1	MDL	10	1		B1THW1	N
11/07/08	699-99-41	Chromium	43.4	ug/L	10	MDL		1		B1X5K4	Y
12/01/09	699-99-41	Chromium	57.1	ug/L	13	MDL		1	B	B22LH0	Y
03/02/11	699-99-41	Chromium	18	ug/L	14	MDL		1	B	B29370	N
03/02/11	699-99-41	Chromium	18	ug/L	14	MDL		1	B	B29372	N
02/13/08	699-99-41	Chromium	55	ug/L	4	MDL		1		B1RB84	N
11/07/08	699-99-41	Chromium	47.2	ug/L	10	MDL		1		B1X5K5	N
12/01/09	699-99-41	Chromium	56.9	ug/L	13	MDL		1	B	B22LH1	N

Table D-1. Groundwater Monitoring Results. (5 Pages)

Sample Date	Well Number	Constituent	Result	Units	Standard Reporting Limit	Reporting Limit Type	Required Detection Limit	Dilution Factor	Lab Qualifier	Sample Number	Filtered?
03/02/11	699-99-41	Chromium	18	ug/L	14	MDL		1	B	B29369	Y
03/02/11	699-99-41	Chromium	18	ug/L	14	MDL		1	B	B29371	Y
02/13/08	699-99-41	Chromium	60.9	ug/L	4	MDL		1		B1RB83	Y
07/30/08	699-99-41	Chromium	14	ug/L	13	MDL		1		B1VKB1	N
11/16/10	699-97-41	Chromium	80	ug/L	14	MDL		1		B283K6	N
03/30/10	699-97-41	Chromium	83.9	ug/L	13	MDL		1		B24HP2	N
11/04/08	699-97-41	Chromium	77.1	ug/L	10	MDL		1		B1X5D1	Y
11/04/08	699-97-41	Chromium	10	ug/L	10	MDL		1	U	B1X5D2	N
05/17/10	699-97-41	Chromium	81.7	ug/L	1	MDL		2	D	B25875	N
05/17/10	699-97-41	Chromium	95	ug/L	13	MDL		1		B25875	N
05/17/10	699-97-41	Chromium	114	ug/L	13	MDL		1		B25874	Y
10/09/09	699-97-41	Chromium	85.7	ug/L	0.5	MDL		1		B225V5	Y
03/21/10	699-97-41	Chromium	84.5	ug/L	1	MDL		2	D	B23W63	N
10/09/09	699-97-41	Chromium	82.8	ug/L	13	MDL		1		B221P9	Y
05/17/10	699-97-41	Chromium	84	ug/L	1	MDL		2	D	B25874	Y
02/08/08	699-97-41	Chromium	73.1	ug/L	4	MDL		1		B1RB53	Y
02/08/08	699-97-41	Chromium	82.1	ug/L	4	MDL		1		B1RB54	N
03/30/10	699-97-41	Chromium	74.7	ug/L	13	MDL		1		B24HP1	Y
10/09/09	699-97-41	Chromium	88.4	ug/L	0.5	MDL		1		B225V6	N
03/21/10	699-97-41	Chromium	88	ug/L	13	MDL		1		B23W62	Y
03/21/10	699-97-41	Chromium	83.9	ug/L	13	MDL		1		B23W63	N
10/09/09	699-97-41	Chromium	79.4	ug/L	13	MDL		1		B221R0	N
11/16/10	699-97-41	Chromium	78	ug/L	14	MDL		1		B283K5	Y
07/28/08	699-97-41	Chromium	59.9	ug/L	13	MDL		1		B1VK62	Y
07/28/08	699-97-41	Chromium	53.1	ug/L	13	MDL		1		B1VK63	N
03/21/10	699-97-41	Chromium	85.3	ug/L	1	MDL		2	D	B23W62	Y
04/25/08	699-97-41	Chromium	73.5	ug/L	3.1	MDL	10	1		B1TJ17	Y
04/25/08	699-97-41	Chromium	80.4	ug/L	3.1	MDL	10	1		B1TJ18	N
05/20/10	199-H1-38	Chromium	56	ug/L	13	MDL		1	B	B22Y20	N
05/18/10	199-H1-40	Chromium	82	ug/L	13	MDL		1		B22Y24	N
10/02/09	199-H1-42	Chromium	81.5	ug/L	13	MDL		1		B21N97	N
10/02/09	199-H1-42	Chromium	79.9	ug/L	13	MDL		1		B21N98	N
05/17/10	199-H1-39	Chromium	65	ug/L	13	MDL		1		B22Y28	N
09/28/09	199-H1-45	Chromium	71.6	ug/L	13	MDL		1		B21NB2	N
03/31/10	199-H1-43	Chromium	85.7	ug/L	13	MDL		1		B24HM3	Y
03/31/10	199-H1-43	Chromium	85.2	ug/L	13	MDL		1		B24HM4	N
10/02/09	199-H1-43	Chromium	78.9	ug/L	13	MDL		1		B21NB9	N
02/16/11	199-H2-1	Chromium	7.44	ug/L				1		B29M07	Y
02/25/11	199-H2-1	Chromium	1	ug/L	1	MDL		2	UD	B29HR6	N
02/22/11	199-H2-1	Chromium	11.4	ug/L	1	MDL		2	D	B29HR4	N
02/16/11	199-H2-1	Chromium	10.1	ug/L	1	MDL		2	D	B29HW8	N
02/16/11	199-H2-1	Chromium	9.06	ug/L	1	MDL		2	BD	B29HW9	N
02/17/11	199-H2-1	Chromium	8.8	ug/L	1	MDL		2	BD	B29HR3	N
02/24/11	199-H2-1	Chromium	2.87	ug/L	1	MDL		2	BD	B29HR5	N
07/30/08	699-99-41	Copper	6	ug/L	6	MDL		1	U	B1VKB0	Y
04/25/08	699-99-41	Copper	4.6	ug/L	4.6	MDL	25	1	U	B1THW0	Y
04/25/08	699-99-41	Copper	4.6	ug/L	4.6	MDL	25	1	U	B1THW1	N
11/07/08	699-99-41	Copper	6	ug/L	6	MDL		1	U	B1X5K4	Y
12/01/09	699-99-41	Copper	4	ug/L	4	MDL		1	U	B22LH0	Y
03/02/11	699-99-41	Copper	5	ug/L	5	MDL		1	U	B29370	N
02/13/08	699-99-41	Copper	4	ug/L	4	MDL		1	U	B1RB84	N
11/07/08	699-99-41	Copper	6	ug/L	6	MDL		1	U	B1X5K5	N
03/02/11	699-99-41	Copper	5	ug/L	5	MDL		1	U	B29372	N
12/01/09	699-99-41	Copper	4	ug/L	4	MDL		1	U	B22LH1	N
03/02/11	699-99-41	Copper	5	ug/L	5	MDL		1	U	B29369	Y
03/02/11	699-99-41	Copper	5	ug/L	5	MDL		1	U	B29371	Y
02/13/08	699-99-41	Copper	4	ug/L	4	MDL		1	U	B1RB83	Y
07/30/08	699-99-41	Copper	6	ug/L	6	MDL		1	U	B1VKB1	N
04/25/08	699-97-41	Copper	4.6	ug/L	4.6	MDL	25	1	U	B1TJ18	N
11/04/08	699-97-41	Copper	6	ug/L	6	MDL		1	U	B1X5D1	Y
11/04/08	699-97-41	Copper	6	ug/L	6	MDL		1	U	B1X5D2	N
05/17/10	699-97-41	Copper	2.35	ug/L	0.2	MDL		2	D	B25875	N
05/17/10	699-97-41	Copper	5	ug/L	4	MDL		1	BC	B25875	N
05/17/10	699-97-41	Copper	7	ug/L	4	MDL		1	BC	B25874	Y
03/21/10	699-97-41	Copper	0.456	ug/L	0.2	MDL		2	BD	B23W63	N
10/09/09	699-97-41	Copper	4	ug/L	4	MDL		1	U	B221P9	Y
05/17/10	699-97-41	Copper	1.89	ug/L	0.2	MDL		2	BD	B25874	Y
02/08/08	699-97-41	Copper	4.1	ug/L	4	MDL		1		B1RB53	Y
02/08/08	699-97-41	Copper	4	ug/L	4	MDL		1	U	B1RB54	N
03/30/10	699-97-41	Copper	5.7	ug/L	4	MDL		1	B	B24HP1	Y
10/09/09	699-97-41	Copper	0.546	ug/L	0.1	MDL		1	B	B225V6	N
03/21/10	699-97-41	Copper	4	ug/L	4	MDL		1	U	B23W62	Y

Table D-1. Groundwater Monitoring Results. (5 Pages)

Sample Date	Well Number	Constituent	Result	Units	Standard Reporting Limit	Reporting Limit Type	Required Detection Limit	Dilution Factor	Lab Qualifier	Sample Number	Filtered?
03/21/10	699-97-41	Copper	4	ug/L	4	MDL		1	U	B23W63	N
10/09/09	699-97-41	Copper	4	ug/L	4	MDL		1	U	B221R0	N
03/30/10	699-97-41	Copper	6.3	ug/L	4	MDL		1	B	B24HP2	N
11/16/10	699-97-41	Copper	5	ug/L	5	MDL		1	U	B283K5	Y
07/28/08	699-97-41	Copper	6	ug/L	6	MDL		1	U	B1VK62	Y
07/28/08	699-97-41	Copper	6	ug/L	6	MDL		1	U	B1VK63	N
10/09/09	699-97-41	Copper	0.252	ug/L	0.1	MDL		1	BC	B225V5	Y
03/21/10	699-97-41	Copper	0.2	ug/L	0.2	MDL		2	UD	B23W62	Y
11/16/10	699-97-41	Copper	5	ug/L	5	MDL		1	U	B283K6	N
04/25/08	699-97-41	Copper	4.6	ug/L	4.6	MDL	25	1	U	B1TJ17	Y
05/20/10	199-H1-38	Copper	18	ug/L	4	MDL		1	B	B22Y20	N
05/18/10	199-H1-40	Copper	12	ug/L	4	MDL		1	B	B22Y24	N
10/02/09	199-H1-42	Copper	9.8	ug/L	4	MDL		1	B	B21N97	N
10/02/09	199-H1-42	Copper	20.6	ug/L	4	MDL		1		B21N98	N
05/17/10	199-H1-39	Copper	14	ug/L	4	MDL		1	BC	B22Y28	N
09/28/09	199-H1-45	Copper	13.3	ug/L	4	MDL		1	B	B21NB2	N
03/31/10	199-H1-43	Copper	4	ug/L	4	MDL		1	U	B24HM3	Y
03/31/10	199-H1-43	Copper	4	ug/L	4	MDL		1	U	B24HM4	N
10/02/09	199-H1-43	Copper	5.3	ug/L	4	MDL		1	B	B21NB9	N
02/16/11	199-H2-1	Copper	10	ug/L				1	U	B29M07	Y
02/25/11	199-H2-1	Copper	12.2	ug/L	0.2	MDL		2	DC	B29HR6	N
02/22/11	199-H2-1	Copper	0.2	ug/L	0.2	MDL		2	UD	B29HR4	N
02/16/11	199-H2-1	Copper	136	ug/L	0.2	MDL		2	D	B29HW8	N
02/16/11	199-H2-1	Copper	46.2	ug/L	0.2	MDL		2	D	B29HW9	N
02/17/11	199-H2-1	Copper	0.854	ug/L	0.2	MDL		2	BD	B29HR3	N
02/24/11	199-H2-1	Copper	17	ug/L	0.2	MDL		2	D	B29HR5	N
05/17/10	699-97-41	Lead	0.2	ug/L	0.2	MDL		2	UD	B25875	N
05/17/10	699-97-41	Lead	23	ug/L	23	MDL		1	U	B25874	Y
05/17/10	699-97-41	Lead	23	ug/L	23	MDL		1	U	B25875	N
03/21/10	699-97-41	Lead	0.2	ug/L	0.2	MDL		2	UD	B23W63	N
05/17/10	699-97-41	Lead	0.2	ug/L	0.2	MDL		2	UD	B25874	Y
10/09/09	699-97-41	Lead	0.1	ug/L	0.1	MDL		1	U	B225V6	N
03/21/10	699-97-41	Lead	23	ug/L	23	MDL		1	U	B23W63	N
03/21/10	699-97-41	Lead	23	ug/L	23	MDL		1	U	B23W62	Y
10/09/09	699-97-41	Lead	0.1	ug/L	0.1	MDL		1	U	B225V5	Y
03/21/10	699-97-41	Lead	0.2	ug/L	0.2	MDL		2	UD	B23W62	Y
02/16/11	199-H2-1	Lead	2.49	ug/L				1	B	B29M07	Y
02/22/11	199-H2-1	Lead	0.2	ug/L	0.2	MDL		2	UD	B29HR4	N
02/16/11	199-H2-1	Lead	7.94	ug/L	0.2	MDL		2	D	B29HW8	N
02/16/11	199-H2-1	Lead	3.51	ug/L	0.2	MDL		2	D	B29HW9	N
02/17/11	199-H2-1	Lead	0.2	ug/L	0.2	MDL		2	UD	B29HR3	N
02/25/11	199-H2-1	Lead	0.2	ug/L	0.2	MDL		2	UD	B29HR6	N
02/24/11	199-H2-1	Lead	1.4	ug/L	0.2	MDL		2	BD	B29HR5	N
05/17/10	699-97-41	Mercury	0.1	ug/L	0.1	MDL		2	UD	B25875	N
03/21/10	699-97-41	Mercury	0.1	ug/L	0.1	MDL		2	UD	B23W63	N
05/17/10	699-97-41	Mercury	0.1	ug/L	0.1	MDL		2	UD	B25874	Y
03/30/10	699-97-41	Mercury	0.1	ug/L	0.1	MDL		2	UD	B24HP2	N
10/09/09	699-97-41	Mercury	0.05	ug/L	0.05	MDL		1	U	B225V6	N
03/30/10	699-97-41	Mercury	0.1	ug/L	0.1	MDL		2	UD	B24HP1	Y
10/09/09	699-97-41	Mercury	0.05	ug/L	0.05	MDL		1	U	B225V5	Y
03/21/10	699-97-41	Mercury	0.1	ug/L	0.1	MDL		2	UD	B23W62	Y
03/31/10	199-H1-43	Mercury	0.1	ug/L	0.1	MDL		2	UDN	B24HM3	Y
03/31/10	199-H1-43	Mercury	0.1	ug/L	0.1	MDL		2	UDN	B24HM4	N
02/22/11	199-H2-1	Mercury	0.1	ug/L	0.1	MDL		2	UD	B29HR4	N
02/16/11	199-H2-1	Mercury	0.1	ug/L	0.1	MDL		2	UD	B29HW8	N
02/16/11	199-H2-1	Mercury	0.1	ug/L	0.1	MDL		2	UD	B29HW9	N
02/17/11	199-H2-1	Mercury	0.1	ug/L	0.1	MDL		2	UD	B29HR3	N
02/25/11	199-H2-1	Mercury	0.1	ug/L	0.1	MDL		2	UD	B29HR6	N
02/24/11	199-H2-1	Mercury	0.1	ug/L	0.1	MDL		2	UD	B29HR5	N
07/30/08	699-99-41	Nickel	5.1	ug/L	4	MDL		1		B1VKB0	Y
04/25/08	699-99-41	Nickel	13.3	ug/L	13.3	MDL	40	1	U	B1THW0	Y
04/25/08	699-99-41	Nickel	13.3	ug/L	13.3	MDL	40	1	U	B1THW1	N
11/07/08	699-99-41	Nickel	6	ug/L	6	MDL		1	U	B1X5K4	Y
11/07/08	699-99-41	Nickel	6	ug/L	6	MDL		1	U	B1X5K5	N
12/01/09	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B22LH0	Y
12/01/09	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B22LH1	N
03/02/11	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B29370	N
03/02/11	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B29372	N
02/13/08	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B1RB84	N
03/02/11	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B29369	Y
03/02/11	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B29371	Y
02/13/08	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B1RB83	Y

Table D-1. Groundwater Monitoring Results. (5 Pages)

Sample Date	Well Number	Constituent	Result	Units	Standard Reporting Limit	Reporting Limit Type	Required Detection Limit	Dilution Factor	Lab Qualifier	Sample Number	Filtered?
07/30/08	699-99-41	Nickel	4	ug/L	4	MDL		1	U	B1VKB1	N
03/30/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B24HP2	N
11/04/08	699-97-41	Nickel	6	ug/L	6	MDL		1	U	B1X5D1	Y
04/25/08	699-97-41	Nickel	13.3	ug/L	13.3	MDL	40	1	U	B1TJ18	N
05/17/10	699-97-41	Nickel	19	ug/L	4	MDL		1	BC	B25874	Y
11/04/08	699-97-41	Nickel	6	ug/L	6	MDL		1	U	B1X5D2	N
05/17/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B25875	N
10/09/09	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B221P9	Y
02/08/08	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B1RB53	Y
02/08/08	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B1RB54	N
03/30/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B24HP1	Y
03/21/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B23W62	Y
10/09/09	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B221R0	N
11/16/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B283K5	Y
07/28/08	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B1VK62	Y
07/28/08	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B1VK63	N
03/21/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B23W63	N
11/16/10	699-97-41	Nickel	4	ug/L	4	MDL		1	U	B283K6	N
04/25/08	699-97-41	Nickel	13.3	ug/L	13.3	MDL	40	1	U	B1TJ17	Y
05/20/10	199-H1-38	Nickel	4	ug/L	4	MDL		1	U	B22Y20	N
05/18/10	199-H1-40	Nickel	6	ug/L	4	MDL		1	B	B22Y24	N
10/02/09	199-H1-42	Nickel	4	ug/L	4	MDL		1	U	B21N97	N
10/02/09	199-H1-42	Nickel	4	ug/L	4	MDL		1	B	B21N98	N
05/17/10	199-H1-39	Nickel	5	ug/L	4	MDL		1	BC	B22Y28	N
09/28/09	199-H1-45	Nickel	4	ug/L	4	MDL		1	U	B21NB2	N
03/31/10	199-H1-43	Nickel	4	ug/L	4	MDL		1	U	B24HM3	Y
03/31/10	199-H1-43	Nickel	4	ug/L	4	MDL		1	U	B24HM4	N
10/02/09	199-H1-43	Nickel	4	ug/L	4	MDL		1	U	B21NB9	N
02/25/11	199-H2-1	Nickel	1.4	ug/L	0.4	MDL		2	BD	B29HR6	N
02/22/11	199-H2-1	Nickel	0.4	ug/L	0.4	MDL		2	UD	B29HR4	N
02/24/11	199-H2-1	Nickel	3.24	ug/L	0.4	MDL		2	BD	B29HR5	N
02/16/11	199-H2-1	Nickel	0.632	ug/L				1	B	B29M07	Y
02/16/11	199-H2-1	Nickel	20.3	ug/L	0.4	MDL		2	D	B29HW8	N
02/16/11	199-H2-1	Nickel	9.24	ug/L	0.4	MDL		2	D	B29HW9	N
02/17/11	199-H2-1	Nickel	0.4	ug/L	0.4	MDL		2	UD	B29HR3	N
07/30/08	699-99-41	Zinc	9	ug/L	9	MDL		1	U	B1VKB0	Y
04/25/08	699-99-41	Zinc	5.2	ug/L	5.2	MDL	20	1	U	B1THW0	Y
04/25/08	699-99-41	Zinc	5.2	ug/L	5.2	MDL	20	1	U	B1THW1	N
02/13/08	699-99-41	Zinc	5.7	ug/L	4	MDL		1		B1RB83	Y
03/02/11	699-99-41	Zinc	163	ug/L	4	MDL		1		B29371	Y
11/07/08	699-99-41	Zinc	9	ug/L	9	MDL		1	U	B1X5K4	Y
12/01/09	699-99-41	Zinc	6	ug/L	6	MDL		1	U	B22LH0	Y
03/02/11	699-99-41	Zinc	444	ug/L	4	MDL		1		B29370	N
02/13/08	699-99-41	Zinc	11	ug/L	4	MDL		1		B1RB84	N
11/07/08	699-99-41	Zinc	9	ug/L	9	MDL		1	U	B1X5K5	N
03/02/11	699-99-41	Zinc	175	ug/L	4	MDL		1		B29372	N
12/01/09	699-99-41	Zinc	6	ug/L	6	MDL		1	U	B22LH1	N
03/02/11	699-99-41	Zinc	95	ug/L	4	MDL		1		B29369	Y
07/30/08	699-99-41	Zinc	9	ug/L	9	MDL		1	U	B1VKB1	N
11/16/10	699-97-41	Zinc	4	ug/L	4	MDL		1	U	B283K6	N
04/25/08	699-97-41	Zinc	5.2	ug/L	5.2	MDL	20	1	U	B1TJ18	N
11/04/08	699-97-41	Zinc	9	ug/L	9	MDL		1	U	B1X5D1	Y
05/17/10	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B25874	Y
11/04/08	699-97-41	Zinc	9	ug/L	9	MDL		1	U	B1X5D2	N
05/17/10	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B25875	N
02/08/08	699-97-41	Zinc	4.4	ug/L	4	MDL		1		B1RB53	Y
02/08/08	699-97-41	Zinc	4.3	ug/L	4	MDL		1		B1RB54	N
10/09/09	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B221P9	Y
03/30/10	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B24HP1	Y
03/21/10	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B23W62	Y
03/21/10	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B23W63	N
10/09/09	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B221R0	N
03/30/10	699-97-41	Zinc	6	ug/L	6	MDL		1	U	B24HP2	N
11/16/10	699-97-41	Zinc	4	ug/L	4	MDL		1	B	B283K5	Y
07/28/08	699-97-41	Zinc	9	ug/L	9	MDL		1	U	B1VK62	Y
07/28/08	699-97-41	Zinc	9	ug/L	9	MDL		1	U	B1VK63	N
04/25/08	699-97-41	Zinc	5.2	ug/L	5.2	MDL	20	1	U	B1TJ17	Y
05/20/10	199-H1-38	Zinc	26	ug/L	6	MDL		1	B	B22Y20	N
05/18/10	199-H1-40	Zinc	46	ug/L	6	MDL		1		B22Y24	N
10/02/09	199-H1-42	Zinc	27.9	ug/L	6	MDL		1	B	B21N97	N
10/02/09	199-H1-42	Zinc	45.1	ug/L	6	MDL		1		B21N98	N
05/17/10	199-H1-39	Zinc	32	ug/L	6	MDL		1		B22Y28	N

Table D-1. Groundwater Monitoring Results. (5 Pages)

Sample Date	Well Number	Constituent	Result	Units	Standard Reporting Limit	Reporting Limit Type	Required Detection Limit	Dilution Factor	Lab Qualifier	Sample Number	Filtered?
09/28/09	199-H1-45	Zinc	68.6	ug/L	6	MDL		1		B21NB2	N
03/31/10	199-H1-43	Zinc	6	ug/L	6	MDL		1	U	B24HM3	Y
10/02/09	199-H1-43	Zinc	51.3	ug/L	6	MDL		1		B21NB9	N
03/31/10	199-H1-43	Zinc	6	ug/L	6	MDL		1	U	B24HM4	N
02/22/11	199-H2-1	Zinc	9.07	ug/L	1.6	MDL		2	BD	B29HR4	N
02/16/11	199-H2-1	Zinc	25.2	ug/L				1		B29M07	Y
02/16/11	199-H2-1	Zinc	138	ug/L	1.6	MDL		2	D	B29HW8	N
02/16/11	199-H2-1	Zinc	63.5	ug/L	1.6	MDL		2	D	B29HW9	N
02/17/11	199-H2-1	Zinc	14.3	ug/L	1.6	MDL		2	D	B29HR3	N
02/25/11	199-H2-1	Zinc	186	ug/L	1.6	MDL		2	D	B29HR6	N
02/24/11	199-H2-1	Zinc	222	ug/L	1.6	MDL		2	D	B29HR5	N

APPENDIX E

CALCULATION BRIEFS

APPENDIX E

CALCULATION BRIEFS

The calculations in this appendix are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the file will be stored in a U.S. Department of Energy, Richland Operations Office repository. This calculation has been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculations," Washington Closure Hanford, Richland, Washington. The following calculations are provided in this appendix.

128-H-1 Waste Site Cleanup Verification 95% UCL Calculation, 0100H-CA-V0178, Rev. 0, Washington Closure Hanford, Richland, Washington.

128-H-1 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations, 0100H-CA-V0177, Rev. 0, Washington Closure Hanford, Richland, Washington.

Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater for the 128-H-1 Waste Site, 0100H-CA-V0176, Rev. 0, Washington Closure Hanford, Richland, Washington.

DISCLAIMER FOR CALCULATIONS

The calculations that are provided in this appendix have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the Administrative Record.

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0178

Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculation

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 49 Attm. 1 = 45 Attm. 2 = 1 Total = 97	T. E. Queen	J. D. Skoglie	B. L. Vedder	D. F. Obenauer	Signed 7/26/11
1	Cover = 1 Sheets = 49 Attm. 1 = 45 Attm. 2 = 1 Total = 97	J. D. Skoglie	T. E. Queen TEQueen	NA	D. F. Obenauer D. F. Obenauer	9/14/11

SUMMARY OF REVISION

1	Attachment 1, sheet 10; The results column for TPH-diesel range was widened so all numbers are legible.

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford

CALCULATION SHEET

Originator	T. E. Queen	**Date**	07/13/11	**Calc. No.**	0100H-CA-V0178	**Rev. No.**	0
Project	100-H Field Remediation	**Job No.**	14655	**Checked**	J. D. Skoglie	**Date**	07/13/11
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations					**Sheet No.**	1 of 49

Summary

Purpose:

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) Model Toxics Control Act (MTCA) 3-part test for nonradionuclide analytes and calculate the relative percent difference (RPD) for primary-duplicate sample pairs for each contaminant of concern (COC) and contaminant of potential concern (COPC), as necessary.

Table of Contents:

Given/References:

1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2009b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets),* Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
10) EPA, 1989, Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A; Interim Final, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D.C.
11) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Administrative Code.*

Solution:

Calculation methodology is described in Ecology Pub. #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2009b). Use data from attached worksheets to perform the 95% UCL calculation for each analyte, the WAC 173-340-740(7)(e) 3-part test for nonradionuclides, and the RPD calculations for each COC/COPC. The hazard quotient and carcinogenic risk calculations are located in a separate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:

The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 128-H-1 waste site. The data were entered into an EXCEL 2003 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with the RDR/RAWP (DOE-RL 2009b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:

The 128-H-1 waste site underwent statistical sampling at six decision units for verification sampling. Information on the re-samples taken at these locations are available in the RSVP.

Analytical results for all sampling locations are summarized in the tables provided on sheets 3, 4, and 5. Further information of the sample data quality is presented in the data quality assessment section of the associated RSVP.

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Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 2 of 49

Summary (continued)

Methodology, continued:

For nonradioactive analytes with ≤50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup is the 95% UCL. For nonradioactive analytes with >50% of the data below detection limits, as determined by direct inspection of the sample results (Attachment 1), the maximum detected value for the data set (which includes primary and duplicate samples) is used instead of the 95% UCL, and no further calculations are performed for those data sets. For convenience, these maximum detected values are included in the summary tables that follow. The 95% UCL was not calculated for data sets with no reported detections. Calculated cleanup levels are not available in Ecology (2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs/COPCs and are also not included in these calculations. The 95% UCL values were not calculated for potassium-40, radium-226, radium-228, thorium-228, and thorium-232 based on natural occurence at the Hanford Site.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above. For radionuclide data, calculation of the statistics is done using the reported value. In cases where the laboratory does not report a value below the minimum detectable activity (MDA), half of the MDA is used in the calculation. For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above.

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets (n < 10), the calculations are performed assuming nonparametric distribution, so no tests for distribution are performed. For nonradionuclide data sets of ten or greater, as for the subject site, distributional testing is done using Ecology's MTCAStat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2009b) and MTCAStat coding and due to a limitation in the MTCAStat coding (no direct capability to address variable quantitation limits within a data set), substitutions for censored data are performed before software input and the resulting data set treated as uncensored.

The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:
1) the 95% UCL exceeds the most stringent cleanup limit for each COPC/COC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC/COC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC/COC.

The RPD is calculated when both the primary value and either the duplicate or split value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed in Table 2-1 of the SAP (DOE-RL 2009a) for certain constituents. All other constituents will have their own pre-determined TDL's based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

$$RPD = [\,|M-S|/((M+S)/2)]*100$$

where, M = Main Sample Value S = Split (or duplicate) Sample Value

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. If the RPD is greater than 30%, further investigation regarding the usability of the data is performed. To assist in the identification of anomalous sample pairs, when an analyte is detected in the primary or duplicate/split sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate/split result exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

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Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the six decision units, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Areas A, B, and C

Analyte	A		B		C		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Antimony						0.239	mg/kg
Arsenic	45.0		65.3		11.7		mg/kg
Barium	84.7		88.2		106		mg/kg
Beryllium	0.277		0.339		0.297		mg/kg
Boron	2.83		3.25		5.07		mg/kg
Cadmium	0.179		0.151		0.153		mg/kg
Chromium	13.1		15.1		13.6		mg/kg
Cobalt	6.55		6.81		6.76		mg/kg
Copper	13.4		13.2		13.9		mg/kg
Hexavalent chromium					0.16		mg/kg
Lead	304		207		93.3		mg/kg
Manganese	314		340		299		mg/kg
Mercury		0.020		0.082		0.030	mg/kg
Molybdenum	0.392		0.272		0.350		mg/kg
Nickel	11.0		12.0		12.8		mg/kg
Vanadium	47.2		46.7		46.3		mg/kg
Zinc	49.5		43.4		43.9		mg/kg
TPH - diesel range		8400				9300	ug/kg
TPH - motor oil	42894		21073		25289		ug/kg
TPH - diesel range EXT		24000					ug/kg
Acenaphthene		10.9	44.3			68.2	ug/kg
Acenapthylene		3.65		1.58		55.4	ug/kg
Anthracene	2.97			2.83		3.54	ug/kg
Benzo(a)anthracene	55.3		18.1		38.7		ug/kg
Benzo(a)pyrene	56.3		27.4		49.1		ug/kg
Benzo(b)fluoranthene	38.1		22.6		52.4		ug/kg
Benzo(ghi)perylene	37.1		20.5		42.1		ug/kg
Benzo(k)fluoranthene	19.0		8.24		23.5		ug/kg
Chrysene	65.2		17.7		35.0		ug/kg
Dibenz(a,h)anthracene	6.28		2.55			18.6	ug/kg
Fluoranthene	96.0		79.4		581		ug/kg
Fluorene		2.87		11.8		4.30	ug/kg
Indeno(1,2,3-cd)pyrene	37.8		22.2		34.3		ug/kg
Naphthalene		5.48					ug/kg
Phenanthrene	59.8		24.2		17.5		ug/kg
Pyrene	187		72.9		84.0		ug/kg
Endosulfan I		1.29					ug/kg
4,4'-DDE		0.29				2.90	ug/kg
Aroclor-1254		8.05		8.75			ug/kg
Aroclor-1260				3.73		3.40	ug/kg
bis(2-ethylhexyl)phthalate		144					ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	A		B		C	
Cleanup Limit?	YES	NO	YES	NO	YES	NO
> 10% above Cleanup Limit?	YES	NO	YES	NO	YES	NO
Any sample > 2x Cleanup Limit?	YES	NO	YES	NO	YES	NO

[a]The 95% UCL result or maximum value, depending on data censorship.

-- = not applicable
B = blank contamination (inorganic constituents)
C = Sample was ≤5X the blank concentration
CVP = closeout verification package
D = dilution
DE = direct exposure
GW = groundwater
J = estimate
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
RAG = remedial action goal
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
SAP = sampling and analysis plan
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = Washington Administrative Code

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Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the six decision units, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Areas D, E, and F

Analyte	D		E		F		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Arsenic	5.18		4.0		3.7		mg/kg
Barium	97.1		67.1		90.6		mg/kg
Beryllium	0.312			0.17	0.27		mg/kg
Boron	4.63		1.3		1.7		mg/kg
Cadmium	0.161		0.082		0.092		mg/kg
Chromium	14.4		12.7		14.1		mg/kg
Cobalt	6.79		6.5		7.3		mg/kg
Copper	13.8		16.7		14.9		mg/kg
Hexavalent chromium	0.15			0.917		0.265	mg/kg
Lead	27.6		6.9		5.8		mg/kg
Manganese	321		271		336		mg/kg
Mercury	0.25		0.013			0.0094	mg/kg
Molybdenum	0.42			0.49			mg/kg
Nickel	11.6		11.5		13.4		mg/kg
Vanadium	51.5		40.8		40.7		mg/kg
Zinc	40.7		36.2		41.0		mg/kg
TPH - diesel range		28800		160000	7451		ug/kg
TPH - motor oil	22992		85416		11223		ug/kg
Acenaphthene	12.7						ug/kg
Acenapthylene		66.2					ug/kg
Anthracene		1.31					ug/kg
Benzo(a)anthracene	9.16			12			ug/kg
Benzo(a)pyrene	8.77						ug/kg
Benzo(b)fluoranthene	9.91			13			ug/kg
Benzo(ghi)perylene	6.11						ug/kg
Benzo(k)fluoranthene	3.88						ug/kg
Chrysene		17.9		15			ug/kg
Dibenz(a,h)anthracene		2.59					ug/kg
Fluoranthene	26.8			23			ug/kg
Fluorene		4.27					ug/kg
Indeno(1,2,3-cd)pyrene	5.14						ug/kg
Naphthalene		6.57					ug/kg
Phenanthrene	10.2						ug/kg
Pyrene	17.1			30			ug/kg
4,4'-DDE		2.46					ug/kg
Aroclor-1254		9.43					ug/kg
Aroclor-1260		19.2					ug/kg
bis(2-ethylhexyl)phthalate			74.2		57		ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	D		E		F	
Cleanup Limit?	YES	YES	NO	NO	NO	NO
> 10% above Cleanup Limit?	YES	NO	NO	NO	NO	NO
Any sample > 2x Cleanup Limit?	YES	NO	NO	NO	NO	NO

[a] The 95% UCL result or maximum value, depending on data censorship.

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Summary (continued)

Results:

The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the six decision units, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Relative Percent Difference Results and QA/QC Analysis[a]

Analyte	Duplicate Analysis					
	A	B	C	D	E	F
Aluminum	3.7%	1.8%	0.9%	1.6%	5.4%	1.0%
Arsenic		6.9%				
Barium	11.5%	4.6%	1.5%	2.4%	0.5%	4.4%
Calcium	0.6%	3.1%	1.5%	1.0%	1.2%	2.1%
Chromium	1.7%	2.1%	5.6%	1.3%	8.5%	4.0%
Copper	3.7%	6.0%	16.2%	0.7%	0.0%	3.9%
Iron	0.0%	1.0%	0.6%	0.9%	3.5%	1.0%
Lead	1.4%	51.1%				
Magnesium	2.0%	0.0%	0.5%	0.6%	2.8%	2.4%
Manganese	0.3%	2.6%	1.4%	1.3%	4.4%	0.3%
Potassium		3.4%		2.7%	2.5%	1.5%
Silicon	51.0%	6.4%	1.8%	5.5%	73.1%	9.2%
Sodium				3.7%		
Vanadium	4.5%	1.1%	0.9%	2.5%	5.7%	0.8%
Zinc	0.5%	3.7%	4.3%	3.2%	2.2%	1.2%
Dibenz(a,h)anthracene	13.8%					
Pyrene	2.9%					

[a]RPD listed where result produced, based on criteria. If RPD not required, no value is listed. The significance of the reported RPD values, including values greater than 30%, is addressed in the data quality assessment section of the RSVP.

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1 **128-H-1 Statistical Calculations**

2 **Verification Data -Area A**

Row	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Beryllium mg/kg	Beryllium Q	Beryllium PQL	Boron mg/kg	Boron Q	Boron PQL	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL	Copper mg/kg	Copper Q	Copper PQL	Lead mg/kg	Lead Q	Lead PQL	Manganese mg/kg	Manganese Q	Manganese PQL
5	A3	J1B856	6/30/10	46.1		0.835	75.3		0.42	0.262		0.167	2.71		1.67	0.088	B	0.21	12.2		0.84	5.83		2.51	13.1		1.67	139		0.84	302		0.835
6	Duplicate of J1B856	J1B866	6/30/10	46.6		0.784	84.5		0.39	0.276		0.157	2.85		1.57	0.086	B	0.20	12.0		0.78	6.11		2.35	13.6		1.57	137		0.78	301		0.784
7	A1	J1B854	6/30/10	15.1		0.874	70.0		0.44	0.219		0.175	1.96		1.75	0.187	B	0.22	10.8		0.87	6.37		2.62	13.1		1.75	73.6		0.87	301		0.874
8	A2	J1B855	6/30/10	23.5		0.844	79.5		0.42	0.302		0.169	2.37		1.69	0.122	B	0.21	14.6		0.84	6.69		2.53	13.8		1.69	84.2		0.84	329		0.844
9	A4	J1B857	6/30/10	56.8		0.820	81.6		0.41	0.276		0.164	3.2		1.64	0.148	B	0.21	13.0		0.82	6.16		2.46	12.6		1.64	406		0.82	331		0.82
10	A5	J1B858	6/30/10	31.8		0.870	69.0		0.44	0.271		0.174	2.53		1.74	0.113	B	0.22	12.7		0.87	6.14		2.61	12.3		1.74	164		0.87	304		0.87
11	A6	J1B859	6/30/10	42.4		0.855	77.8		0.43	0.275		0.171	2.79		1.71	0.179	B	0.21	13.1		0.86	5.95		2.56	12.7		1.71	278		0.86	300		0.855
12	A7	J1B860	6/30/10	29.7		0.845	79.1		0.42	0.241		0.169	3.17		1.69	0.177	B	0.21	11.6		0.85	5.47		2.54	12.8		1.69	319		0.85	289		0.845
13	A8	J1B861	6/30/10	33.8		0.839	83.7		0.42	0.253		0.168	2.58		1.68	0.091	B	0.21	12.7		0.84	5.92		2.52	12		1.68	98.0		0.84	291		0.839
14	A-9[a]	J1JVX2	6/16/11	40.5		0.35	80.1		0.07	0.21		0.031	2.80		0.91	0.29		0.038	12.4		0.054	6.60		0.09	14		0.2	348	X	0.15	311		0.15
15	A10	J1B863	6/30/10	47.6		0.949	85.5		0.47	0.321		0.190	2.66		1.90	0.116	B	0.24	13.7		0.95	6.75		2.85	13.7		1.9	224		0.95	326		0.949
16	A11	J1B864	6/30/10	16.5		0.678	72.1		0.34	0.200		0.136	2.11		1.36	0.121	B	0.17	10.2		0.68	6.84		2.04	13.8		1.36	88.3		0.68	282		0.678
17	A12	J1B865	6/30/10	17.3		0.822	105		0.41	0.184		0.164	1.93		1.64	0.114	B	0.21	12.6		0.82	6.80		2.47	13		1.64	86.0		0.82	302		0.822

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19 **Statistical Computation Input Data**

Row	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
22	A3	J1B856/ J1B866	6/30/10	46.4	79.9	0.269	2.78	0.0870	12.1	5.97	13.4	138	302
23	A1	J1B854	6/30/10	15.1	70.0	0.219	1.96	0.187	10.8	6.37	13.1	73.6	301
24	A2	J1B855	6/30/10	23.5	79.5	0.302	2.37	0.122	14.6	6.69	13.8	84.2	329
25	A4	J1B857	6/30/10	56.8	81.6	0.276	3.20	0.148	13.0	6.16	12.6	406	331
26	A5	J1B858	6/30/10	31.8	69.0	0.271	2.53	0.113	12.7	6.14	12.3	164	304
27	A6	J1B859	6/30/10	42.4	77.8	0.275	2.79	0.179	13.1	5.95	12.7	278	300
28	A7	J1B860	6/30/10	29.7	79.1	0.241	3.17	0.177	11.6	5.47	12.8	319	289
29	A8	J1B861	6/30/10	33.8	83.7	0.253	2.58	0.0910	12.7	5.92	12.0	98.0	291
30	A-9[a]	J1JVX2	6/16/11	40.5	80.1	0.21	2.8	0.29	12.4	6.60	14.0	348	311
31	A10	J1B863	6/30/10	47.6	85.5	0.321	2.66	0.116	13.7	6.75	13.7	224	326
32	A11	J1B864	6/30/10	16.5	72.1	0.200	2.11	0.121	10.2	6.84	13.8	88.3	282
33	A12	J1B865	6/30/10	17.3	105	0.184	1.93	0.114	12.6	6.80	13.0	86.0	302

34 **Statistical Computations**

Row		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
39	Mean	33.4	80.3	0.252	2.57	0.145	12.5	6.31	13.1	192	306
40	Standard deviation	13.6	9.34	0.0419	0.421	0.057	1.19	0.437	0.64	119	15.9
41	95% UCL on mean	45.0	84.7	0.277	2.83	0.179	13.1	6.55	13.4	304	314
42	Maximum value	56.8	105	0.321	3.20	0.290	14.6	6.84	14.0	406	331
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
44	**WAC 173-340 3-PART TEST**										
45	95% UCL > Cleanup Limit?	YES	NA	NA	NO	NA	NA	NA	NA	YES	NA
46	> 10% above Cleanup Limit?	YES	NA	NA	NO	NA	NA	NA	NA	YES	NA
47	Any sample > 2X Cleanup Limit?	YES	NA	NA	NO	NA	NA	NA	NA	YES	NA
48	**WAC 173-340 Compliance?**	A detailed assessment will be performed. The data set does not meet the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

Footnotes apply to all pages of this calculation.

[a] Sample A-9 was resampled due to a dieldrin exceedance.

[b] = Sample B-13 was mislabeled in the verification work instruction. There are a total of 12 samples for this decision unit.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 7 of 49

1 **128-H-1 Statistical Calculations**
2 **Verification Data -Area A**

	Sample	Sample	Sample	Molybdenum			Nickel			Vanadium			Zinc			TPH - motor oil			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	A3	J1B856	6/30/10	0.338	B	0.835	10.4		2.09	36.9		0.835	43.9		2.51	21100		10100	4.22		3.38	32.7		3.38	47.1		3.38	30.2		3.38
6	Duplicate of J1B856	J1B866	6/30/10	0.283	B	0.784	10.7		1.96	38.6		0.784	44.1		2.35	31400		10000	3.51		3.34	32.4		3.34	75.7		3.34	43.8		3.34
7	A1	J1B854	6/30/10	0.346	B	0.874	9.50		2.18	50		0.874	40.5		2.62	8010	J	9980	3.32	U	3.32	3.04	J	3.32	6.65		3.32	5.79		3.32
8	A2	J1B855	6/30/10	0.422	B	0.844	12.6		2.11	45.6		0.844	43.0		2.53	24800		9850	3.28	U	3.28	4.51		3.28	8.07		3.28	6.02		3.28
9	A4	J1B857	6/30/10	0.459	B	0.820	10.4		2.05	43.4		0.820	50.7		2.46	54300		9960	1.33	J	3.32	23.9		3.32	51.5		3.32	34.4		3.32
10	A5	J1B858	6/30/10	0.354	B	0.870	10.0		2.18	42.8		0.870	43.8		2.61	12400		10100	1.18	J	3.37	15.3		3.37	55.0		3.37	40.3		3.37
11	A6	J1B859	6/30/10	0.337	B	0.855	10.6		2.14	41.6		0.855	50.1		2.56	26900		9620	5.93		3.20	51.4		3.20	88.0		3.20	60.0		3.20
12	A7	J1B860	6/30/10	0.421	B	0.845	11.0		2.11	41.1		0.845	48.7		2.54	70400		9900	3.63		3.30	39.0		3.30	63.9		3.30	46.8		3.30
13	A8	J1B861	6/30/10	0.368	B	0.839	10.5		2.1	41.3		0.839	42.0		2.52	21400		9870	2.30	J	3.29	28.2		3.29	43.8		3.29	30.6		3.29
14	A-9[a]	J1JVX2	6/16/11	0.28	B	0.15	10.7		0.11	38.1		0.15	49.3	X	0.37				2.80	U	2.80	31	X	2.9	58		5.9	34		3.9
15	A10	J1B863	6/30/10	0.315	B	0.949	11.7		2.37	44.8		0.949	58.5		2.85	14100		10400	1.21	J	3.46	26.7		3.46	48.8		3.46	30.9		3.46
16	A11	J1B864	6/30/10	0.369	B	0.678	9.32		1.70	50.7		0.678	43.2		2.04	13500		9640	3.21	U	3.21	9.00		3.21	17.0		3.21	15.3		3.21
17	A12	J1B865	6/30/10	0.369	B	0.822	8.99		2.05	54.8		0.822	47.4		2.47	12400		9780	3.26	U	3.26	6.20		3.26	10.7		3.26	11.9		3.26

18
19 **Statistical Computation Input Data**

	Sample	Sample	Sample	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	A3	J1B856/ J1B866	6/30/10	0.311	10.6	37.8	44.0	26250	3.87	32.6	61.4	37.0
23	A1	J1B854	6/30/10	0.346	9.50	50.0	40.5	8010	1.66	3.04	6.65	5.79
24	A2	J1B855	6/30/10	0.422	12.6	45.6	43.0	24800	1.64	4.51	8.07	6.02
25	A4	J1B857	6/30/10	0.459	10.4	43.4	50.7	54300	1.33	23.9	51.5	34.4
26	A5	J1B858	6/30/10	0.354	10.0	42.8	43.8	12400	1.18	15.3	55.0	40.3
27	A6	J1B859	6/30/10	0.337	10.6	41.6	50.1	26900	5.93	51.4	88.0	60.0
28	A7	J1B860	6/30/10	0.421	11.0	41.1	48.7	70400	3.63	39.0	63.9	46.8
29	A8	J1B861	6/30/10	0.368	10.5	41.3	42.0	21400	2.30	28.2	43.8	30.6
30	A-9[a]	J1JVX2	6/16/11	0.280	10.7	38.1	49.3		1.40	31	58	34
31	A10	J1B863	6/30/10	0.315	11.7	44.8	58.5	14100	1.21	26.7	48.8	30.9
32	A11	J1B864	6/30/10	0.369	9.32	50.7	43.2	13500	1.61	9.0	17.0	15.3
33	A12	J1B865	6/30/10	0.369	8.99	54.8	47.4	12400	1.63	6.2	10.7	11.9

34 **Statistical Computations**

35		Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution..	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.
37	N	12	12	12	12	11	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	42%	0%	0%	0%
39	Mean	0.363	10.5	44.3	46.8	25860	2.28	22.6	42.7	29.4
40	Standard deviation	0.0515	1.00	5.19	5.0	19460	1.46	15.2	26.2	16.7
41	95% UCL on mean	0.392	11.0	47.2	49.5	42894	2.97	55.3	56.3	38.1
42	Maximum value	0.459	12.6	54.8	58.5	70400	5.93	51.4	88.0	60.0
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	240000 GW Protection	15 GW & River Protection	15 GW & River Protection	15 GW & River Protection
44	WAC 173-340 3-PART TEST									
45	95% UCL > Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 8 of 49

1 **128-H-1 Statistical Calculations**
2 **Verification Data -Area A**

	Sample	Sample	Sample	Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
3																											
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	A3	J1B856	6/30/10	26.6		3.38	14.9		3.38	31.9		3.38	5.19		3.38	99.3		3.38	16.9		3.38	50.0		3.38	96.4		3.38
6	Duplicate of J1B856	J1B866	6/30/10	44.3		3.34	21.0		3.34	32.0		3.34	7.67		3.34	114		3.34	46.4		3.34	34.8		3.34	99.2		3.34
7	A1	J1B854	6/30/10	4.84		3.32	2.56	J	3.32	1.96	J	3.32	3.32	U	3.32	3.32	U	3.32	2.93	J	3.32	3.16	J	3.32	8.01		3.32
8	A2	J1B855	6/30/10	5.76		3.28	2.84	J	3.28	4.04		3.28	1.07	J	3.28	3.28	U	3.28	5.17		3.28	2.79	J	3.28	9.80		3.28
9	A4	J1B857	6/30/10	39.7		3.32	15.1		3.32	18.1		3.32	6.87		3.32	65.7		3.32	45.9		3.32	15.6		3.32	66.0		3.32
10	A5	J1B858	6/30/10	51.9		3.37	16.5		3.37	12.8		3.37	7.13		3.37	40.1		3.37	48.1		3.37	12.0		3.37	40.5		3.37
11	A6	J1B859	6/30/10	51.0		3.2	29.9		3.20	46.3		3.20	9.75		3.20	179		3.20	56.4		3.20	50.7		3.20	184		3.20
12	A7	J1B860	6/30/10	37.7		3.3	21.9		3.30	37.2		3.30	7.10		3.30	157		3.30	40.4		3.30	57.1		3.30	141		3.30
13	A8	J1B861	6/30/10	26.3		3.29	15.0		3.29	26.2		3.29	4.31		3.29	99.7		3.29	25.5		3.29	32.2		3.29	92.5		3.29
14	A-9[a]	J1JVX2	6/16/11	38		6.6	25		3.6	36	J	4.5	10	U	10	34	JX	12	38		11	14	J	11	58		11
15	A10	J1B863	6/30/10	28.0		3.46	15.1		3.46	28.3		3.46	5.26		3.46	59.0		3.46	30.5		3.46	11.2		3.46	62.2		3.46
16	A11	J1B864	6/30/10	13.9		3.21	6.44		3.21	8.53		3.21	1.98	J	3.21	25.4		3.21	5.93		3.21	7.07		3.21	27.2		3.21
17	A12	J1B865	6/30/10	7.81		3.26	4.19		3.26	4.12		3.26	1.26	J	3.26	17.1		3.26	5.36		3.26	4.89		3.26	16.2		3.26

18
19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
21	Area	Number	Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	A3	J1B856/ J1B866	6/30/10	35.5	18.0	32.0	6.43	107	31.7	42.4	97.8
23	A1	J1B854	6/30/10	4.84	2.56	1.96	1.66	1.66	2.93	3.16	8.01
24	A2	J1B855	6/30/10	5.76	2.84	4.04	1.07	1.64	5.17	2.79	9.80
25	A4	J1B857	6/30/10	39.7	15.1	18.1	6.87	65.7	45.9	15.6	66.0
26	A5	J1B858	6/30/10	51.9	16.5	12.8	7.13	40.1	48.1	12.0	40.5
27	A6	J1B859	6/30/10	51.0	29.9	46.3	9.75	179	56.4	50.7	184
28	A7	J1B860	6/30/10	37.7	21.9	37.2	7.10	157	40.4	57.1	141
29	A8	J1B861	6/30/10	26.3	15.0	26.2	4.31	99.7	25.5	32.2	92.5
30	A-9[a]	J1JVX2	6/16/11	38	25	36	5.0	34	38	14	58
31	A10	J1B863	6/30/10	28.0	15.1	28.3	5.26	59.0	30.5	11.2	62.2
32	A11	J1B864	6/30/10	13.9	6.44	8.53	1.98	25.4	5.93	7.07	27.2
33	A12	J1B865	6/30/10	7.81	4.19	4.12	1.26	17.1	5.36	4.89	16.2

34 **Statistical Computations**

35		Benzo(ghi)perylene		Benzo(k)fluoranthene		Chrysene		Dibenz(a,h)anthracene		Fluoranthene		Indeno(1,2,3-cd)pyrene		Phenanthrene		Pyrene	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
37	N	12		12		12		12		12		12		12		12	
38	% < Detection limit	0%		0%		0%		17%		17%		0%		0%		0%	
39	Mean	28.4		14.4		21.3		4.82		65.6		28.0		21.1		66.9	
40	Standard deviation	16.9		8.89		15.1		2.81		58.7		19.0		19.4		54.3	
41	95% UCL on mean	37.1		19.0		65.2		6.28		96.0		37.8		59.8		187	
42	Maximum value	51.9		29.9		46.3		9.75		179		56.4		57.1		184	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	48000	GW & River Protection	15	GW & River Protection	100	GW & River Protection	30	GW & River Protection	18000	River Protection	330	GW & River Protection	240000	GW Protection	48000	GW Protection
44	**WAC 173-340 3-PART TEST**																
45	95% UCL > Cleanup Limit?	NO		YES		NO		NO		NO		NO		NO		NO	
46	> 10% above Cleanup Limit?	NO		YES		NO		NO		NO		NO		NO		NO	
47	Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO		NO	
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.		A detailed assessment will be performed. The data set does meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
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128-H-1 Maximum Calculations
Verification Data -Area A

Sample Area	Sample Number	Sample Date	Mercury			TPH - diesel range			TPH - diesel range EXT			Acenaphthene			Acenapthylene			Fluorene			Naphthalene			4,4'-DDE			Endosulfan I		
			mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	0.027	U	0.027	3380	U	3380				3.38	U	3.38	3.38	U	3.38	2.87	J	3.38	3.38	U	3.38	1.26	UD	1.26	1.26	UD	1.26
Duplicate of J1B856	J1B866	6/30/10	0.028	U	0.028	3340	U	3340				3.34	U	3.34	3.34	U	3.34	2.51	J	3.34	3.34	U	3.34	1.31	UD	1.31	1.31	UD	1.31
A1	J1B854	6/30/10	0.0090	B	0.020	3330	U	3330				1.81	J	3.32	3.32	U	3.32	3.32	U	3.32	3.32	U	3.32	1.34	UD	1.34	1.34	UD	1.34
A2	J1B855	6/30/10	0.029	U	0.029	3280	U	3280				3.28	U	3.28	3.28	U	3.28	3.28	U	3.28	3.28	U	3.28	1.35	UD	1.35	1.35	UD	1.35
A4	J1B857	6/30/10	0.025	U	0.025	3320	U	3320				3.32	U	3.32	3.65		3.32	1.49	J	3.32	5.48		3.32	1.29	UD	1.29	1.29	JD	1.29
A5	J1B858	6/30/10	0.026	U	0.026	3380	U	3380				0.844	J	3.37	2.53	J	3.37	3.37	U	3.37	3.55		3.37	1.27	UD	1.27	1.27	UD	1.27
A6	J1B859	6/30/10	0.025	U	0.025	3210	U	3210				3.37		3.20	3.20	U	3.20	2.73	J	3.20	3.20	U	3.20	1.32	UD	1.32	1.32	UD	1.32
A7	J1B860	6/30/10	0.023	U	0.023	3300	U	3300				2.81	J	3.30	3.30	U	3.30	1.82	J	3.30	3.30	U	3.30	1.37	UD	1.37	1.37	UD	1.37
A8	J1B861	6/30/10	0.025	U	0.025	3290	U	3290				3.29	U	3.29	3.29	U	3.29	1.20	J	3.29	3.29	U	3.29	1.32	UD	1.32	1.32	UD	1.32
A-9[a]	J1JVX2	6/16/11	0.020	M	0.0053	8400	N	680	24000	N	1000	9.2	U	9.2	8.3	U	8.3	4.9	U	4.9	11	U	11	0.29	JX	0.22	0.16	U	0.16
A10	J1B863	6/30/10	0.025	U	0.025	3460	U	3460				10.9		3.46	3.46	U	3.46	3.46	U	3.46	3.46	U	3.46	1.33	UD	1.33	1.33	UD	1.33
A11	J1B864	6/30/10	0.020	B	0.030	3210	U	3210				3.21	U	3.21	3.21	U	3.21	3.21	U	3.21	3.21	U	3.21	1.28	UD	1.28	1.28	UD	1.28
A12	J1B865	6/30/10	0.027	U	0.027	3260	U	3260				3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	1.33	UD	1.33	1.33	UD	1.33

Statistical Computations

	Mercury	TPH - diesel range	TPH - diesel range EXT	Acenaphthene	Acenapthylene	Fluorene	Naphthalene	4,4'-DDE	Endosulfan I
% < Detection limit	75%	92%	0%	58%	83%	58%	83%	92%	92%
Maximum value	0.020	8400	24000	10.9	3.65	2.87	5.48	0.29	1.29
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	0.33 GW & River Protection	200000 DE, GW, & River Protection	200000 DE, GW, & River Protection	96000 GW Protection	96000 GW Protection	64000 GW Protection	16000 GW Protection	3.3 River Protection	11.2 River Protection
3-PART TEST									
Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
3-Part Test Compliance?	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

128-H-1 Maximum Calculations
Verification Data -Area A

Sample Area	Sample Number	Sample Date	Aroclor-1254			bis(2-ethylhexyl)phthalate		
			ug/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	3.61	J	3.61	319	U	319
Duplicate of J1B856	J1B866	6/30/10	13.1	U	13.1	327	U	327
A1	J1B854	6/30/10	13.4	U	13.4	332	U	332
A2	J1B855	6/30/10	13.5	U	13.5	317	U	317
A4	J1B857	6/30/10	12.9	U	12.9	328	U	328
A5	J1B858	6/30/10	12.7	U	12.7	337	U	337
A6	J1B859	6/30/10	13.2	U	13.2	331	U	331
A7	J1B860	6/30/10	13.6	U	13.6	340	U	340
A8	J1B861	6/30/10	8.05	J	13.2	332	U	332
A-9[a]	J1JVX2	6/16/11	2.6	U	2.6	71	JB	44
A10	J1B863	6/30/10	13.3	U	13.3	144	J	340
A11	J1B864	6/30/10	12.7	U	12.7	324	U	324
A12	J1B865	6/30/10	13.3	U	13.3	329	U	329

Statistical Computations

	Aroclor-1254	bis(2-ethylhexyl)phthalate
% < Detection limit	83%	83%
Maximum value	8.05	144
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	17 GW & River Protection	360 River Protection
3-PART TEST		
Maximum > Cleanup Limit?	NO	NO
> 10% above Cleanup Limit?	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator: T. E. Queen	Date: 07/13/11	Calc. No.: 0100H-CA-V0178	Rev. No.: 0
Project: 100-H Field Remediation	Job No.: 14655	Checked: J. D. Skoglie	Date: 07/13/11
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 10 of 49

128-H-1 Statistical Calculations

Verification Data -Area B

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
B8	J1B887	6/29/10	71.1		0.744	84.1		0.37	0.332		0.149	3.04		1.49	0.13	B	0.19	14.0		0.74	6.75		2.23	11.3		1.49	124		0.74	342		0.744
Duplicate of J1B887	J1B892	6/29/10	76.2		0.762	88.1		0.38	0.338		0.152	3.21		1.52	0.124	B	0.19	14.3		0.76	6.58		2.29	12.0		1.52	209		0.76	351		0.762
B1	J1B880	6/29/10	39.5		0.836	73.9		0.42	0.281		0.167	2.11		1.67	0.196	B	0.21	14.4		0.84	6.04		2.51	10.2		1.67	98.3		0.84	303		0.836
B2	J1B881	6/29/10	43.8		0.801	75.7		0.40	0.307		0.160	2.17		1.60	0.112	B	0.20	13.5		0.80	6.22		2.4	10.7		1.60	43.6		0.80	315		0.80
B3	J1B882	6/29/10	45.1		0.711	80.2		0.36	0.334		0.142	2.06		1.42	0.085	B	0.18	14.7		0.71	6.7		2.13	13.1		1.42	24.0		0.71	324		0.711
B4	J1B883	6/29/10	39.1		0.904	80.4		0.45	0.324		0.181	2.01		1.81	0.123	B	0.23	14.5		0.90	6.68		2.71	12.2		1.81	48.3		0.90	335		0.90
B13[b]	J1B884	6/29/10	24.8		1.01	86.1		0.51	0.336		0.202	2.93		2.02	0.143	B	0.25	14.4		1.01	6.87		3.04	12.4		2.02	58.3		1.01	347		1.01
B6	J1B885	6/29/10	12.9		0.950	82.0		0.48	0.281		0.190	3.51		1.90	0.158	B	0.24	13.0		0.95	6.02		2.85	13.0		1.90	166		0.95	296		0.95
B7	J1B886	6/29/10	14.2		0.752	78.3		0.38	0.351		0.150	2.19		1.50	0.105	B	0.19	14.9		0.75	7.03		2.26	13.5		1.50	9.41		0.75	337		0.752
B9	J1B888	6/29/10	36.5		0.814	80.6		0.41	0.316		0.163	2.52		1.63	0.146	B	0.20	13.2		0.81	6.61		2.44	11.3		1.63	178		0.81	341		0.814
B10	J1B889	6/29/10	47.6		0.877	76.3		0.44	0.281		0.175	2.85		1.75	0.124	B	0.22	12.7		0.88	5.94		2.63	10.3		1.75	125		0.88	299		0.877
B11	J1B890	6/29/10	97.7		0.801	86.8		0.40	0.341		0.160	2.37		1.60	0.104	B	0.20	13.9		0.80	6.81		2.40	11.8		1.60	95.7		0.80	354		0.80
B12	J1B891	6/29/10	16.0		0.848	113		0.42	0.380		0.170	5.53		1.70	0.161	B	0.21	18.8		0.85	7.33		2.54	16.8		1.70	30.1		0.85	345		0.848

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
B8	J1B887/ J1B892	6/29/10	73.7	86.1	0.335	3.13	0.127	14.2	6.67	11.7	167	347
B1	J1B880	6/29/10	39.5	73.9	0.281	2.11	0.196	14.4	6.04	10.2	98.3	303
B2	J1B881	6/29/10	43.8	75.7	0.307	2.17	0.112	13.5	6.22	10.7	43.6	315
B3	J1B882	6/29/10	45.1	80.2	0.334	2.06	0.085	14.7	6.70	13.1	24.0	324
B4	J1B883	6/29/10	39.1	80.4	0.324	2.01	0.123	14.5	6.68	12.2	48.3	335
B13[b]	J1B884	6/29/10	24.8	86.1	0.336	2.93	0.143	14.4	6.87	12.4	58.3	347
B6	J1B885	6/29/10	12.9	82.0	0.281	3.51	0.158	13.0	6.02	13.0	166	296
B7	J1B886	6/29/10	14.2	78.3	0.351	2.19	0.105	14.9	7.03	13.5	9.41	337
B9	J1B888	6/29/10	36.5	80.6	0.316	2.52	0.146	13.2	6.61	11.3	178	341
B10	J1B889	6/29/10	47.6	76.3	0.281	2.85	0.124	12.7	5.94	10.3	125	299
B11	J1B890	6/29/10	97.7	86.8	0.341	2.37	0.104	13.9	6.81	11.8	95.7	354
B12	J1B891	6/29/10	16.0	113.0	0.380	5.53	0.161	18.8	7.33	16.8	30.1	345

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mean	40.9	83.3	0.322	2.78	0.132	14.3	6.58	12.2	86.9	329
Standard deviation	24.8	10.3	0.0307	0.989	0.0305	1.57	0.435	1.80	60.2	20.5
95% UCL on mean	65.3	88.2	0.339	3.25	0.151	15.1	6.81	13.2	207	340
Maximum value	97.7	113	0.380	5.53	0.196	18.8	7.33	16.8	209	354
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	YES	NA	NA	NO	NA	NO	NA	NA	YES	NA
> 10% above Cleanup Limit?	YES	NA	NA	NO	NA	NO	NA	NA	YES	NA
Any sample > 2X Cleanup Limit?	YES	NA	NA	NO	NA	NO	NA	NA	YES	NA
WAC 173-340 Compliance?	A detailed assessment will be performed. The data set does not meet the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford

Originator	T. E. Queen	Date	07/13/11	Calc. No.	0100H-CA-V0178
Project	100-H Field Remediation	Job No.	14655	Checked	J. D. Skoglie
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations	Rev. No.	0	Date	07/13/11
		Sheet No.	11 of 49		

1 **128-H-1 Statistical Calculations**

2 **Verification Data -Area B**

3	Sample	Sample	Sample	Molybdenum			Nickel			Vanadium			Zinc			TPH - motor oil			Acenapthene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	B8	J1B887	6/29/10	0.217	B	0.744	11.1		1.86	44.4		0.744	41.9		2.23	9720	J	10300	1.38	J	3.44	10.9		3.44	12.9		3.44	10.5		3.44
6	Duplicate of J1B887	J1B892	6/29/10	0.233	B	0.762	11.1		1.91	44.9		0.762	43.5		2.29	8470	J	10200	3.38	U	3.38	4.06		3.38	6.34		3.38	5.33		3.38
7	B1	J1B880	6/29/10	0.232	B	0.836	10.5		2.09	46.5		0.836	45.8		2.51	57000		9940	3.32	U	3.32	2.97	J	3.32	3.83		3.32	5.05		3.32
8	B2	J1B881	6/29/10	0.269	B	0.801	11.1		2.00	42.8		0.801	38.6		2.40	8480	J	10200	3.41	U	3.41	5.74		3.41	6.17		3.41	5.01		3.41
9	B3	J1B882	6/29/10	0.216	B	0.711	12.1		1.78	44.9		0.711	37.7		2.13	6540	J	9890	3.36	U	3.36	3.52		3.36	2.86	J	3.36	2.27	J	3.36
10	B4	J1B883	6/29/10	0.224	B	0.904	11.7		2.26	44.9		0.904	41.1		2.71	5880	J	10000	1.18	J	3.37	13.1		3.37	19.7		3.37	12.1		3.37
11	B13[b]	J1B884	6/29/10	0.330	B	1.01	11.8		2.53	47.8		1.01	42.4		3.04	10700		10200	1.34	J	3.35	15.9		3.35	24.1		3.35	17.8		3.35
12	B6	J1B885	6/29/10	0.230	B	0.950	10.6		2.37	46.8		0.95	42.2		2.85	8600	J	9760	35.0		3.35	19.2		3.35	24.5		3.35	20.4		3.35
13	B7	J1B886	6/29/10	0.233	B	0.752	12.9		1.88	46.9		0.752	39.3		2.26	4230	J	10000	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30
14	B9	J1B888	6/29/10	0.228	B	0.814	11.1		2.04	44.0		0.814	41.8		2.44	13600		9630	3.37	U	3.44	2.78	J	3.44	4.64		3.44	3.00	J	3.44
15	B10	J1B889	6/29/10	0.207	B	0.877	10.4		2.19	42.4		0.877	39.2		2.63	13200		9990	178		3.33	14.8		3.33	18.7		3.33	15.3		3.33
16	B11	J1B890	6/29/10	0.220	B	0.801	11.0		2.00	44.5		0.801	44.5		2.40	5890	J	9970	3.41	U	3.41	4.66		3.41	8.51		3.41	8.68		3.41
17	B12	J1B891	6/29/10	0.369	B	0.848	14.0		2.12	50.2		0.848	47.0		2.54	26000		10500	15.8		3.51	14.4		3.51	17.2		3.51	22.1		3.51

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Acenapthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	B8	J1B887/ J1B892	6/29/10	0.225	11.1	44.7	42.7	9095	1.54	7.48	9.62	7.92
23	B1	J1B880	6/29/10	0.232	10.5	46.5	45.8	57000	1.66	2.97	3.83	5.05
24	B2	J1B881	6/29/10	0.269	11.1	42.8	38.6	8480	1.71	5.74	6.17	5.01
25	B3	J1B882	6/29/10	0.216	12.1	44.9	37.7	6540	1.68	3.52	2.86	2.27
26	B4	J1B883	6/29/10	0.224	11.7	44.9	41.1	5880	1.18	13.1	19.7	12.1
27	B13[b]	J1B884	6/29/10	0.330	11.8	47.8	42.4	10700	1.34	15.9	24.1	17.8
28	B6	J1B885	6/29/10	0.230	10.6	46.8	42.2	8600	35.0	19.2	24.5	20.4
29	B7	J1B886	6/29/10	0.233	12.9	46.9	39.3	4230	1.65	1.65	1.65	1.65
30	B9	J1B888	6/29/10	0.228	11.1	44.0	41.8	13600	1.72	2.78	4.64	3.00
31	B10	J1B889	6/29/10	0.207	10.4	42.4	39.2	13200	178	14.8	18.7	15.3
32	B11	J1B890	6/29/10	0.220	11.0	44.5	44.5	5890	1.71	4.66	8.51	8.68
33	B12	J1B891	6/29/10	0.369	14.0	50.2	47.0	26000	15.8	14.4	17.2	22.1

34 **Statistical Computations**

35		Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Acenapthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	0%	50%	8%	8%	8%
39	Mean	0.249	11.5	45.5	41.9	14101	20.2	8.85	11.8	10.1
40	Standard deviation	0.0501	1.06	2.21	2.89	14682	50.7	6.19	8.51	7.27
41	95% UCL on mean	0.272	12.0	46.7	43.4	21073	44.3	18.1	27.4	22.6
42	Maximum value	0.369	14.0	50.2	47.0	57000	178	19.2	24.5	22.1
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	96000 GW Protection	15 GW & River Protection	15 GW & River Protection	15 GW & River Protection
44	WAC 173-340 3-PART TEST									
45	95% UCL > Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NA	NO	NO	YES	YES	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NA	NO	NO	NO	NO	NO
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 12 of 49

128-H-1 Statistical Calculations

Verification Data -Area B

Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene ug/kg	Q	PQL	Benzo(k)fluoranthene ug/kg	Q	PQL	Chrysene ug/kg	Q	PQL	Dibenz(a,h)anthracene ug/kg	Q	PQL
B8	J1B887	6/29/10	9.60		3.44	4.85		3.44	9.67		3.44	1.62	J	3.44
Duplicate of J1B887	J1B892	6/29/10	8.01		3.38	2.30	J	3.38	3.94		3.38	3.38	U	3.38
B1	J1B880	6/29/10	5.33		3.32	1.79	J	3.32	1.94	J	3.32	1.06	J	3.32
B2	J1B881	6/29/10	4.54		3.41	2.78	J	3.41	3.33	J	3.41	3.41	U	3.41
B3	J1B882	6/29/10	2.00	J	3.36	1.30	J	3.36	2.02	J	3.36	3.36	U	3.36
B4	J1B883	6/29/10	15.4		3.37	6.93		3.37	7.17		3.37	2.34	J	3.37
B13[b]	J1B884	6/29/10	18.2		3.35	8.72		3.35	7.31		3.35	3.30	J	3.35
B6	J1B885	6/29/10	20.8		3.35	9.91		3.35	9.79		3.35	3.79	0	3.35
B7	J1B886	6/29/10	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30
B9	J1B888	6/29/10	4.32		3.44	1.87	J	3.44	0.861	J	3.44	3.37	U	3.44
B10	J1B889	6/29/10	13.1		3.33	7.03		3.33	22.0		3.33	1.97	J	3.33
B11	J1B890	6/29/10	12.6		3.41	3.00	J	3.41	1.94	J	3.41	1.02	J	3.41
B12	J1B891	6/29/10	9.70		3.51	7.17		3.51	16.2		3.51	2.18	J	3.51

Sample Area	Sample Number	Sample Date	Fluoranthene ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL
B8	J1B887	6/29/10	35.6		3.44	10.1		3.44	10.7		3.44	25.6		3.44
Duplicate of J1B887	J1B892	6/29/10	10.1		3.38	4.21		3.38	4.06		3.38	11.9		3.38
B1	J1B880	6/29/10	9.63		3.32	2.04	J	3.32	5.81		3.32	18.5		3.32
B2	J1B881	6/29/10	8.03		3.41	5.13		3.41	2.73	J	3.41	14.4		3.41
B3	J1B882	6/29/10	3.70		3.36	1.16	J	3.36	2.61	J	3.36	4.78		3.36
B4	J1B883	6/29/10	19.6		3.37	15.1		3.37	9.95		3.37	31.0		3.37
B13[b]	J1B884	6/29/10	30.1		3.35	20.7		3.35	8.48		3.35	33.6		3.35
B6	J1B885	6/29/10	89.7		3.35	23.3		3.35	19.8		3.35	59.2		3.35
B7	J1B886	6/29/10	3.3	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30
B9	J1B888	6/29/10	6.1		3.44	3.21	J	3.44	3.54		3.44	5.65		3.44
B10	J1B889	6/29/10	37.0		3.33	9.68		3.33	44.5		3.33	40.7		3.33
B11	J1B890	6/29/10	11.4		3.41	8.84		3.41	4.69		3.41	10.7		3.41
B12	J1B891	6/29/10	43.4		3.51	5.60		3.51	16.2		3.51	40.5		3.51

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene ug/kg	Benzo(k)fluoranthene ug/kg	Chrysene ug/kg	Dibenz(a,h)anthracene ug/kg	Fluoranthene ug/kg	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg
B8	J1B887/ J1B892	6/29/10	8.81	3.58	6.81	1.66	22.9	7.16	7.38	18.8
B1	J1B880	6/29/10	5.33	1.79	1.94	1.06	9.63	2.04	5.81	18.5
B2	J1B881	6/29/10	4.54	2.78	3.33	1.71	8.03	5.13	2.73	14.4
B3	J1B882	6/29/10	2.00	1.30	2.02	1.68	3.70	1.16	2.61	4.8
B4	J1B883	6/29/10	15.4	6.93	7.17	2.34	19.6	15.1	10.0	31.0
B13[b]	J1B884	6/29/10	18.2	8.72	7.31	3.30	30.1	20.7	8.48	33.6
B6	J1B885	6/29/10	20.8	9.91	9.79	3.79	89.7	23.3	19.8	59.2
B7	J1B886	6/29/10	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
B9	J1B888	6/29/10	4.32	1.87	0.861	1.72	6.08	3.21	3.54	5.65
B10	J1B889	6/29/10	13.1	7.03	22.0	1.97	37.0	9.68	44.5	40.7
B11	J1B890	6/29/10	12.6	3.00	1.94	1.02	11.4	8.84	4.69	10.7
B12	J1B891	6/29/10	9.70	7.17	16.2	2.18	43.4	5.60	16.2	40.5

Statistical Computations

	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12
% < Detection limit	8%	8%	8%	33%	8%	8%	8%	8%
Mean	9.70	4.64	6.75	2.01	23.6	8.63	10.6	23.3
Standard deviation	6.38	3.09	6.55	0.820	24.8	7.42	12.0	17.7
95% UCL on mean	20.5	8.24	17.7	2.55	79.4	22.2	24.2	72.9
Maximum value	20.8	9.91	22.0	3.79	89.7	23.3	44.5	59.2
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	48000 GW & River Protection	15 GW & River Protection	100 GW & River Protection	30 GW & River Protection	18000 River Protection	330 GW & River Protection	240000 GW Protection	48000 GW Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 13 of 49

128-H-1 Maximum Calculations
Verification Data -Area B

Sample Area	Sample Number	Sample Date	Mercury			Acenapthylene			Anthracene			Fluorene			Aroclor-1254			Aroclor-1260		
			mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
B8	J1B887	6/29/10	0.028	U	0.028	3.44	U	3.44	3.44	U	3.44	3.44	U	3.44	13.6	U	13.6	13.6	U	13.6
Duplicate of J1B887	J1B892	6/29/10	0.026	U	0.026	3.38	U	3.38	3.38	U	3.38	3.38	U	3.38	13.4	U	13.4	13.4	U	13.4
B1	J1B880	6/29/10	0.025	U	0.025	3.32	U	3.32	3.32	U	3.32	3.32	U	3.32	13.3	U	13.3	13.3	U	13.3
B2	J1B881	6/29/10	0.025	U	0.025	3.41	U	3.41	3.41	U	3.41	3.41	U	3.41	13.6	U	13.6	13.6	U	13.6
B3	J1B882	6/29/10	0.025	U	0.025	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	13.4	U	13.4	13.4	U	13.4
B4	J1B883	6/29/10	0.025	U	0.025	3.37	U	3.37	3.37	U	3.37	2.19	J	3.37	13.2	U	13.2	13.2	U	13.2
B13[b]	J1B884	6/29/10	0.027	U	0.027	3.35	U	3.35	1.26	J	3.35	3.35	U	3.35	13.7	U	13.7	13.7	U	13.7
B6	J1B885	6/29/10	0.028	U	0.028	3.35	U	3.35	1.01	J	3.35	3.35	U	3.35	13.2	U	13.2	13.2	U	13.2
B7	J1B886	6/29/10	0.009	B	0.020	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	13.3	U	13.3	13.3	U	13.3
B9	J1B888	6/29/10	0.023	U	0.023	3.37	U	3.44	3.37	U	3.44	3.37	U	3.44	13.6	U	13.6	13.6	U	13.6
B10	J1B889	6/29/10	0.023	U	0.023	3.33	U	3.33	2.83	J	3.33	11.8		3.33	8.75	J	13.2	13.2	U	13.2
B11	J1B890	6/29/10	0.026	U	0.026	3.41	U	3.41	3.41	U	3.41	3.41	U	3.41	13.6	U	13.6	13.6	U	13.6
B12	J1B891	6/29/10	0.082		0.030	1.58	J	3.51	1.76	J	3.51	3.51	U	3.51	14.2	U	14.2	3.73	J	14.2

Statistical Computations

	Mercury	Acenapthylene	Anthracene	Fluorene	Aroclor-1254	Aroclor-1260
% < Detection limit	83%	92%	67%	83%	92%	92%
Maximum value	0.082	1.58	2.83	11.8	8.75	3.73
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	0.33 GW & River Protection	96000 GW Protection	240000 GW Protection	64000 GW Protection	17 GW & River Protection	17 GW & River Protection
3-PART TEST						
Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO
3-Part Test Compliance?	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator: T. E. Queen	Date: 07/13/11	Calc. No.: 0100H-CA-V0174	Rev. No.: 0
Project: 100-H Field Remediation	Job No.: 14655	Checked: J. D. Skoglie	Date: 07/13/11
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 14 of 49

128-H-1 Statistical Calculations

Verification Data - Area C

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Hexavalent chromium mg/kg	Q	PQL	Lead mg/kg	Q	PQL
C8	J1B8B0	6/29/10	6.90		0.680	83.9		0.340	0.254		0.136	3.15		1.36	0.118	B	0.170	12.8	J	0.680	6.06		2.03	14.0		1.36	0.14	B	0.20	16.3		0.678
Duplicate of J1B8B0	J1B8B5	6/29/10	7.00		0.688	85.2		0.340	0.250		0.138	2.55		1.38	0.129	B	0.170	12.1	J	0.690	6.06		2.06	11.9		1.38	0.18	B	0.20	17.5		0.688
C1	J1B893	6/17/10	3.92		0.711	126		0.360	0.270		0.142	8.00		1.42	0.187		0.180	11.6		0.710	6.06		2.13	14.4		1.42	0.18	B	0.21	21.2		0.711
C2	J1B894	6/17/10	4.01		0.751	114		0.380	0.282		0.150	7.13		1.50	0.159	B	0.190	12.4		0.750	6.13		2.25	12.8		1.50	0.16	B	0.20	18.8		0.751
C3	J1B895	6/17/10	3.41		0.644	89.2		0.320	0.299		0.129	2.31		1.29	0.101	B	0.160	12.6		0.640	6.89		1.93	13.1		1.29	0.11	B	0.20	4.99		0.644
C4	J1B896	6/17/10	3.19		0.823	102		0.410	0.309		0.165	2.83		1.65	0.130	B	0.210	13.6		0.820	7.65		2.47	15.0		1.65	0.14	B	0.20	4.78		0.823
C5	J1B897	6/17/10	3.65		0.894	97.9		0.450	0.318		0.179	2.72		1.79	0.131	B	0.220	12.3		0.890	7.10		2.68	13.3		1.79	0.19	B	0.21	5.69		0.894
C6	J1B8B1	6/17/10	4.38		0.837	97.3		0.420	0.306		0.167	3.76		1.67	0.148	B	0.210	12.4		0.840	7.21		2.51	13.3		1.67	0.11	B	0.22	13.1		0.837
C7	J1B899	6/29/10	2.50		0.774	50.9		0.390	0.213		0.155	1.69		1.55	0.123	B	0.190	12.9	J	0.770	5.87		2.32	15.5		1.55	0.18	B	0.20	5.07		0.774
C9	J1B898	6/29/10	9.36		0.762	90.0		0.380	0.289		0.152	3.47		1.52	0.130	B	0.190	14.3	J	0.760	6.38		2.29	13.8		1.52	0.16	B	0.20	37.9		0.762
C10	J1B8B2	6/29/10	18.6		0.657	102		0.330	0.292		0.131	5.28		1.31	0.191		0.160	15.8	J	0.660	5.17		1.97	11.9		1.31	0.11	B	0.20	198		0.657
C11	J1B8B3	6/29/10	11.2		0.753	72.2		0.380	0.247		0.151	2.02		1.51	0.111	B	0.190	12.6	J	0.750	5.09		2.26	8.93		1.51	0.20	U	0.20	32.0		0.753
C12	J1B8B4	6/29/10	15.6		0.765	77.5		0.380	0.296		0.153	2.31		1.53	0.105	B	0.190	13.4	J	0.770	6.17		2.29	12.2		1.53	0.20	U	0.20	43.6		0.765

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Hexavalent chromium mg/kg	Lead mg/kg
C8	J1B8B0/ J1B8B5	6/29/10	6.95	84.6	0.252	2.85	0.124	12.5	6.06	13.0	0.16	16.9
C1	J1B893	6/17/10	3.92	126	0.270	8.00	0.187	11.6	6.06	14.4	0.18	21.2
C2	J1B894	6/17/10	4.01	114	0.282	7.13	0.159	12.4	6.13	12.8	0.16	18.8
C3	J1B895	6/17/10	3.41	89.2	0.299	2.31	0.101	12.6	6.89	13.1	0.11	4.99
C4	J1B896	6/17/10	3.19	102	0.309	2.83	0.130	13.6	7.65	15.0	0.14	4.78
C5	J1B897	6/17/10	3.65	97.9	0.318	2.72	0.131	12.3	7.10	13.3	0.19	5.69
C6	J1B8B1	6/17/10	4.38	97.3	0.306	3.76	0.148	12.4	7.21	13.3	0.11	13.1
C7	J1B899	6/29/10	2.50	50.9	0.213	1.69	0.123	12.9	5.87	15.5	0.18	5.07
C9	J1B898	6/29/10	9.36	90.0	0.289	3.47	0.130	14.30	6.38	13.8	0.16	37.9
C10	J1B8B2	6/29/10	18.6	102	0.292	5.28	0.191	15.8	5.17	11.9	0.11	198.0
C11	J1B8B3	6/29/10	11.2	72.2	0.247	2.02	0.111	12.60	5.09	8.9	0.10	32.0
C12	J1B8B4	6/29/10	15.6	77.5	0.296	2.31	0.105	13.4	6.17	12.2	0.10	43.6

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Hexavalent chromium	Lead
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%
Mean	7.23	92.0	0.281	3.70	0.137	13.0	6.32	13.1	0.14	33.5
Standard deviation	5.35	19.7	0.0305	2.04	0.0294	1.12	0.782	1.69	0.034	53.5
95% UCL on mean	11.7	106	0.297	5.07	0.153	13.6	6.76	13.9	0.16	93.3
Maximum value	18.6	126	0.318	8.00	0.191	15.8	7.65	15.5	0.19	198
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	2 River Protection	10.2 GW & River Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen — Date 07/13/11 — Calc. No. 0100H-CA-V0178 — Rev. No. 0
Project 100-H Field Remediation — Job No. 14655 — Checked J. D. Skoglie — Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 15 of 49

128-H-1 Statistical Calculations

Verification Data - Area C

Sample Area	Sample Number	Sample Date	Manganese mg/kg	Q	PQL	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
C8	J1B8B0	6/29/10	276		0.027	0.301	B	0.678	9.96	J	1.70	46.2	J	0.678	38.5		2.03
Duplicate of J1B8B0	J1B8B5	6/29/10	280		0.024	0.286	B	0.688	10.0	J	1.72	46.6	J	0.688	40.2		2.06
C1	J1B893	6/17/10	270		0.030	0.434	B	0.711	10.0		1.78	46.4		0.711	44.2		2.13
C2	J1B894	6/17/10	270		0.026	0.367	B	0.751	10.8		1.88	40.6		0.751	43.4		2.25
C3	J1B895	6/17/10	290		0.031	0.298	B	0.644	12.4		1.61	41.3		0.644	40.1		1.93
C4	J1B896	6/17/10	320		0.026	0.325	B	0.823	14.3		2.06	49.6		0.823	44.9		2.47
C5	J1B897	6/17/10	314		0.026	0.301	B	0.894	12.6		2.24	43.3		0.894	44.6		2.68
C6	J1B8B1	6/17/10	326		0.032	0.345	B	0.837	11.5		2.09	47.7		0.837	47.3		2.51
C7	J1B899	6/29/10	235		0.030	0.354	B	0.774	17.6	J	1.93	44.3	J	0.774	39.4		2.32
C9	J1B898	6/29/10	305		0.028	0.331	B	0.762	11.2	J	1.91	50.1	J	0.762	41.9		2.29
C10	J1B8B2	6/29/10	250		0.020	0.299	B	0.657	9.53	J	1.64	38.1	J	0.657	44.8		1.97
C11	J1B8B3	6/29/10	249		0.023	0.249	B	0.753	9.64	J	1.88	36.4	J	0.753	35.6		2.26
C12	J1B8B4	6/29/10	287		0.020	0.237	B	0.765	11.0	J	1.91	42.1	J	0.765	38.8		2.29

Sample Area	Sample Number	Sample Date	TPH - motor oil ug/kg	Q	PQL	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL
C8	J1B8B0	6/29/10	9130	J	9710	85.7	J	3.29	50.8	J	3.29	85.1	J	3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	11600	J	9920	2.89	J	3.30	4.16	J	3.30	5.00	J	3.30
C1	J1B893	6/17/10	36400		10200	13.4		3.53	11.1		3.53	4.24		3.53
C2	J1B894	6/17/10	29500		10200	3.14	J	3.3	2.48	J	3.3	3.47		3.30
C3	J1B895	6/17/10	10200	U	10200	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34
C4	J1B896	6/17/10	10100	U	10100	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37
C5	J1B897	6/17/10	13400		10500	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36
C6	J1B8B1	6/17/10	4060	J	10700	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59
C7	J1B899	6/29/10	10000	UJ	10000	3.16	UJ	3.16	3.16	UJ	3.16	3.16	UJ	3.16
C9	J1B898	6/29/10	17200	J	9990	129	J	3.13	179	J	3.13	190	J	3.13
C10	J1B8B2	6/29/10	18500	J	9960	31.1	J	3.34	46.6	J	3.34	47.3	J	3.34
C11	J1B8B3	6/29/10	5430	J	10000	15.0	J	3.34	14.3	J	3.34	10.7	J	3.34
C12	J1B8B4	6/29/10	16000	J	9920	11.9	J	3.26	12.6	J	3.26	11.7	J	3.26

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Manganese mg/kg	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	TPH - motor oil ug/kg	Benzo(a)anthracene ug/kg	Benzo(a)pyrene ug/kg	Benzo(b)fluoranthene ug/kg
C8	J1B8B0/ J1B8B5	6/29/10	278	0.294	10.0	46.4	39.4	10365	44.3	27.5	45.1
C1	J1B893	6/17/10	270	0.434	10.0	46.4	44.2	36400	13.4	11.1	4.24
C2	J1B894	6/17/10	270	0.367	10.8	40.6	43.4	29500	3.14	2.48	3.47
C3	J1B895	6/17/10	290	0.298	12.4	41.3	40.1	5100	1.67	1.67	1.67
C4	J1B896	6/17/10	320	0.325	14.3	49.6	44.9	5050	1.69	1.69	1.69
C5	J1B897	6/17/10	314	0.301	12.6	43.3	44.6	13400	1.68	1.68	1.68
C6	J1B8B1	6/17/10	326	0.345	11.5	47.7	47.3	4060	1.80	1.80	1.80
C7	J1B899	6/29/10	235	0.354	17.6	44.3	39.4	5000	1.58	1.58	1.58
C9	J1B898	6/29/10	305	0.331	11.2	50.1	41.9	17200	129	179	190
C10	J1B8B2	6/29/10	250	0.299	9.53	38.1	44.8	18500	31.1	46.6	47.3
C11	J1B8B3	6/29/10	249	0.249	9.64	36.4	35.6	5430	15.0	14.3	10.7
C12	J1B8B4	6/29/10	287	0.237	11.0	42.1	38.8	16000	11.9	12.6	11.7

Statistical Computations

	Manganese	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	25%	42%	42%	42%
Mean	283	0.319	11.7	43.9	42.0	13834	21.4	25.2	26.7
Standard deviation	29.6	0.0531	2.32	4.36	3.39	10455	36.5	50.3	54.0
95% UCL on mean	299	0.350	12.8	46.3	43.9	25289	38.7	49.1	52.4
Maximum value	326	0.434	17.6	50.1	47.3	36400	129	179	190
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	512 GW & River Protection	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	15 GW & River Protection	15 GW & River Protection	15 GW & River Protection
WAC 173-340 3-PART TEST									
95% UCL > Cleanup Limit?	NA	NO	NA	NA	NA	NO	YES	YES	YES
> 10% above Cleanup Limit?	NA	NO	NA	NA	NA	NO	YES	YES	YES
Any sample > 2X Cleanup Limit?	NA	NO	NA	NA	NA	NO	YES	YES	YES
WAC 173-340 Compliance?	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 16 of 49

128-H-1 Statistical Calculations

Verification Data - Area C

Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene ug/kg	Q	PQL	Benzo(k)fluoranthene ug/kg	Q	PQL	Chrysene ug/kg	Q	PQL	Fluoranthene ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL
C8	J1B8B0	6/29/10	26.6	J	3.29	26.2		3.29	105	J	3.29	261	J	3.29	22.5	J	3.29	50.3		3.29	181	J	3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	3.27	J	3.30	1.87	J	3.30	3.29	J	3.30	8.59	J	3.30	1.39	J	3.30	4.46		3.30	5.95	J	3.30
C1	J1B893	6/17/10	90.1		3.53	6.89		3.53	19.4		3.53	11.0		3.53	9.19		3.53	26.5		3.53	35.5		3.53
C2	J1B894	6/17/10	1.82	J	3.30	1.65	J	3.30	22.7		3.30	14.7		3.30	7.44		3.30	9.26		3.30	6.12		3.30
C3	J1B895	6/17/10	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34
C4	J1B896	6/17/10	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37
C5	J1B897	6/17/10	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	2.19	J	2.19	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36
C6	J1B8B1	6/17/10	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59	11.0		3.59	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59
C7	J1B899	6/29/10	3.16	UJ	3.16	3.16	U	3.16	3.16	UJ	3.16	3.16	UJ	3.16	3.16	UJ	3.16	3.16	U	3.16	3.16	UJ	3.16
C9	J1B898	6/29/10	116	J	3.13	86.3		3.13	99.9	J	3.13	149	J	3.13	121	J	3.13	19.3		3.13	262	J	3.13
C10	J1B8B2	6/29/10	34.3	J	3.34	17.6		3.34	30.3	J	3.34	100	J	3.34	35.3	J	3.34	33.3		3.34	104	J	3.34
C11	J1B8B3	6/29/10	10.6	J	3.34	5.6		3.34	8.18	J	3.34	29.4	J	3.34	14.7	J	3.3	9.7		3.34	33.3	J	3.34
C12	J1B8B4	6/29/10	8.93	J	3.26	5.35		3.26	8.66	J	3.26	24.5	J	3.26	10.9	J	3.26	8.97		3.26	30.5	J	3.26

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene ug/kg	Benzo(k)fluoranthene ug/kg	Chrysene ug/kg	Fluoranthene ug/kg	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg
C8	J1B8B0/ J1B8B5	6/29/10	14.9	14.0	54.1	135	11.9	27.4	93.5
C1	J1B893	6/17/10	90.1	6.89	19.4	11.0	9.19	26.5	35.5
C2	J1B894	6/17/10	1.82	1.65	22.7	14.7	7.44	9.26	6.12
C3	J1B895	6/17/10	1.67	1.67	1.67	1.67	1.67	1.67	1.67
C4	J1B896	6/17/10	1.69	1.69	1.69	1.69	1.69	1.69	1.69
C5	J1B897	6/17/10	1.68	1.68	1.68	2.19	1.68	1.68	1.68
C6	J1B8B1	6/17/10	1.80	1.80	1.80	11.0	1.80	1.80	1.80
C7	J1B899	6/29/10	1.58	1.58	1.58	1.58	1.58	1.58	1.58
C9	J1B898	6/29/10	116	86.3	99.9	149	121	19.3	262
C10	J1B8B2	6/29/10	34.3	17.6	30.3	100	35.3	33.3	104
C11	J1B8B3	6/29/10	10.6	5.55	8.18	29.4	14.7	9.70	33.3
C12	J1B8B4	6/29/10	8.93	5.35	8.66	24.5	10.9	8.97	30.5

Statistical Computations

	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12
% < Detection limit	42%	42%	42%	25%	42%	42%	42%
Mean	23.8	12.1	21.0	40.1	18.2	11.9	47.8
Standard deviation	38.6	23.9	29.5	54.8	33.7	11.7	76.4
95% UCL on mean	42.1	23.5	35.0	561	34.3	17.5	84.0
Maximum value	116	86.3	105	261	121	50.3	262
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	48000 GW & River Protection	15 GW & River Protection	100 GW & River Protection	18000 River Protection	330 GW & River Protection	240000 GW Protection	48000 GW Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 17 of 49

128-H-1 Maximum Calculations

Verification Data - Area C

Sample Area	Sample Number	Sample Date	Antimony mg/kg	Q	PQL	Mercury mg/kg	Q	PQL	TPH - diesel range ug/kg	Q	PQL	Acenapthene ug/kg	Q	PQL
C8	J1B8B0	6/29/10	0.239	JB	0.68	0.027	U	0.027	3240	U	3240	68.2		3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	0.688	UJ	0.688	0.024	U	0.024	3310	U	3310	3.30	U	3.30
C1	J1B893	6/17/10	0.711	U	0.711	0.030	B	0.030	9300		3410	12.5		3.53
C2	J1B894	6/17/10	0.751	U	0.751	0.026	U	0.026	8630		3390	3.30	U	3.30
C3	J1B895	6/17/10	0.644	U	0.644	0.031	U	0.031	3390	U	3390	3.34	U	3.34
C4	J1B896	6/17/10	0.823	U	0.823	0.026	U	0.026	3370	U	3370	3.37	U	3.37
C5	J1B897	6/17/10	0.894	U	0.894	0.026	U	0.026	3500	U	3500	3.36	U	3.36
C6	J1B8B1	6/17/10	0.837	U	0.837	0.032	U	0.032	3570	U	3570	3.59	U	3.59
C7	J1B899	6/29/10	0.774	UJ	0.774	0.030	U	0.030	3340	U	3340	3.16	U	3.16
C9	J1B898	6/29/10	0.762	UJ	0.762	0.028	U	0.028	3330	U	3330	3.1	U	3.13
C10	J1B8B2	6/29/10	0.657	UJ	0.657	0.015	B	0.020	5320		3320	0.837	J	3.34
C11	J1B8B3	6/29/10	0.753	UJ	0.753	0.023	U	0.023	3340	U	3340	14.2		3.34
C12	J1B8B4	6/29/10	0.765	UJ	0.765	0.008	B	0.020	7630		3310	3.26	U	3.26

Sample Area	Acenapthylene ug/kg	Q	PQL	Anthracene ug/kg	Q	PQL	Dibenz(a,h)anthracene ug/kg	Q	PQL	Fluorene ug/kg	Q	PQL	4,4'-DDE ug/kg	Q	PQL	Aroclor-1260 ug/kg	Q	PQL
C8	3.29	U	3.29	3.54		3.29	5.20		3.29	3.29	U	3.29	1.29	UD	1.29	12.9	U	12.9
Duplicate of J1B8B0	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	1.34	UD	1.34	13.3	U	13.3
C1	3.53	U	3.53	1.59	J	3.53	3.53	U	3.53	3.53	U	3.53	1.41	UD	1.41	14.1	U	14.1
C2	3.30	U	3.30	3.30	U	3.30	3.30	U	3.30	4.30		3.30	1.30	UD	1.30	13.0	U	13.0
C3	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	3.34	U	3.34	1.30	UD	1.30	13.0	U	13.0
C4	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	3.37	U	3.37	1.36	UD	1.36	13.6	U	13.6
C5	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	1.39	UD	1.39	13.8	U	13.8
C6	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59	1.43	UD	1.43	14.3	U	14.3
C7	3.16	U	3.16	3.16	U	3.16	3.16	U	3.16	3.16	U	3.16	1.29	UD	1.29	12.9	U	12.9
C9	1.72	J	3.13	2.67	J	3.13	18.6		3.13	0.909	J	3.13	1.36	UD	1.36	13.6	U	13.6
C10	55.4		3.34	3.34	U	3.34	7.14		3.34	3.34	U	3.34	2.90	JD	2.90	3.40	J	13.4
C11	5.52		3.34	3.34	U	3.34	1.61	J	3.34	3.34	U	3.34	1.32	UD	1.32	13.2	U	13.2
C12	3.26	U	3.26	3.26	U	3.26	1.47	J	3.26	3.26	U	3.26	1.34	UD	1.34	13.4	U	13.4

Statistical Computations

	Antimony	Mercury	TPH - diesel range	Acenapthene	Acenapthylene
% < Detection limit	92%	75%	67%	67%	75%
Maximum value	0.239	0.030	9300	68.2	55.4
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	5 GW & River Protection	0.33 GW & River Protection	200000 DE, GW, & River Protection	96000 GW Protection	96000 GW Protection
3-PART TEST					
Maximum > Cleanup Limit?	NA	NA	NO	NO	NO
> 10% above Cleanup Limit?	NA	NA	NO	NO	NO
Any sample > 2X Cleanup Limit?	NA	NA	NO	NO	NO
3-Part Test Compliance?	Because all values are below background (5 mg/kg) the 3-part test is not required.	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

	Anthracene	Dibenz(a,h)anthracene	Fluorene	4,4'-DDE	Aroclor-1260
% < Detection limit	75%	58%	83%	92%	92%
Maximum value	3.54	18.6	4.30	2.90	3.40
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	240000 GW Protection	30 GW & River Protection	64000 GW Protection	3.3 River Protection	17 GW & River Protection
3-PART TEST					
Maximum > Cleanup Limit?	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 18 of 49

128-H-1 Statistical Calculations

Verification Data - Area D

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	3.31		0.793	98.6		0.400	0.385		0.159	2.26		1.59
Duplicate of J1B8C0	J1B8C8	6/29/10	3.29		0.749	101		0.370	0.396		0.150	2.20		1.50
D1	J1B8B6	6/29/10	3.46		0.743	98.7		0.370	0.338		0.149	3.53		1.49
D2	J1B8B7	6/29/10	3.14		0.990	105		0.500	0.240		0.198	7.11		1.98
D3	J1B8B8	6/29/10	3.31		0.677	91.4		0.340	0.301		0.135	3.26		1.35
D4	J1B8B9	6/29/10	2.75		0.881	71.4		0.440	0.263		0.176	2.21		1.76
D6	J1B8C1	6/29/10	2.96		0.798	76.5		0.400	0.211		0.160	3.42		1.60
D7	J1B8C2	6/29/10	2.78		0.680	85.7		0.340	0.279		0.136	1.99		1.36
D8	J1B8C3	6/29/10	2.26		0.680	58.1		0.340	0.205		0.136	1.61		1.36
D9	J1B8C4	6/29/10	3.57		0.806	85.1		0.400	0.328		0.161	1.91		1.61
D10	J1B8C5	6/29/10	6.68		0.822	107		0.410	0.272		0.164	6.91		1.64
D11	J1B8C6	6/29/10	10.7		0.635	97.2		0.320	0.290		0.127	4.12		1.27
D12	J1B8C7	6/29/10	3.80		0.757	61.4		0.380	0.245		0.151	1.91		1.51

Sample Area	Sample Number	Sample Date	Cadmium			Chromium			Cobalt			Copper			Hexavalent chromium			Lead		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	0.137	B	0.200	15.0	J	0.793	7.44		2.38	13.3		1.59	0.20	U	0.20	5.03		0.793
Duplicate of J1B8C0	J1B8C8	6/29/10	0.130	B	0.190	15.2	J	0.749	7.67		2.25	13.4		1.50	0.11	B	0.22	5.09		0.749
D1	J1B8B6	6/29/10	0.129	B	0.190	14.5	J	0.743	6.81		2.23	12.1		1.49	0.16	B	0.20	3.75		0.743
D2	J1B8B7	6/29/10	0.191	B	0.250	11.3	J	0.990	5.14		2.97	12.6		1.98	0.21	U	0.21	19.9		0.990
D3	J1B8B8	6/29/10	0.108	B	0.170	13.3	J	0.677	6.26		2.03	12.0		1.35	0.20	U	0.20	4.08		0.677
D4	J1B8B9	6/29/10	0.153	B	0.220	14.6	J	0.881	7.05		2.64	13.6		1.76	0.21	U	0.21	6.90		0.881
D6	J1B8C1	6/29/10	0.144	B	0.200	12.9	J	0.798	5.82		2.40	13.7		1.60	0.070	B	0.20	19.6		0.798
D7	J1B8C2	6/29/10	0.129	B	0.170	12.2	J	0.680	7.10		2.04	12.3		1.36	0.14	B	0.20	4.90		0.680
D8	J1B8C3	6/29/10	0.123	B	0.170	12.1	J	0.680	6.34		2.04	11.7		1.36	0.16	B	0.20	4.67		0.680
D9	J1B8C4	6/29/10	0.146	B	0.200	13.4	J	0.806	6.59		2.42	10.9		1.61	0.18	B	0.21	5.13		0.806
D10	J1B8C5	6/29/10	0.227		0.210	12.5	J	0.822	6.10		2.47	17.4		1.64	0.090	B	0.20	74.9		0.822
D11	J1B8C6	6/29/10	0.140	B	0.160	16.4	J	0.635	6.13		1.90	13.8		1.27	0.12	B	0.20	44.4		0.635
D12	J1B8C7	6/29/10	0.119	B	0.190	14.7	J	0.757	6.26		2.27	12.5		1.51	0.17	B	0.20	14.4		0.757

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Hexavalent chromium mg/kg	Lead mg/kg
D5	J1B8C0/ J1B8C8	6/29/10	3.30	99.8	0.391	2.23	0.134	15.1	7.56	13.4	0.11	5.06
D1	J1B8B6	6/29/10	3.46	98.7	0.338	3.53	0.129	14.5	6.81	12.1	0.16	3.75
D2	J1B8B7	6/29/10	3.14	105	0.240	7.11	0.191	11.3	5.14	12.6	0.11	19.9
D3	J1B8B8	6/29/10	3.31	91.4	0.301	3.26	0.108	13.3	6.26	12.0	0.10	4.08
D4	J1B8B9	6/29/10	2.75	71.4	0.263	2.21	0.153	14.6	7.05	13.6	0.11	6.90
D6	J1B8C1	6/29/10	2.96	76.5	0.211	3.42	0.144	12.9	5.82	13.7	0.07	19.6
D7	J1B8C2	6/29/10	2.78	85.7	0.279	1.99	0.129	12.2	7.10	12.3	0.14	4.90
D8	J1B8C3	6/29/10	2.26	58.1	0.205	1.61	0.123	12.1	6.34	11.7	0.16	4.67
D9	J1B8C4	6/29/10	3.57	85.1	0.328	1.91	0.146	13.4	6.59	10.9	0.18	5.13
D10	J1B8C5	6/29/10	6.68	107	0.272	6.91	0.227	12.5	6.10	17.4	0.09	74.9
D11	J1B8C6	6/29/10	10.7	97.2	0.290	4.12	0.140	16.4	6.13	13.8	0.12	44.4
D12	J1B8C7	6/29/10	3.80	61.4	0.245	1.91	0.119	14.7	6.26	12.5	0.17	14.4

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Hexavalent chromium	Lead
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%
Mean	4.06	86.4	0.280	3.35	0.145	13.6	6.43	13.0	0.13	17.3
Standard deviation	2.36	16.5	0.0539	1.88	0.0332	1.49	0.64	1.65	0.035	21.6
95% UCL on mean	5.18	97.1	0.312	4.63	0.161	14.4	6.79	13.8	0.15	27.6
Maximum value	10.7	107	0.396	7.11	0.227	16.4	7.67	17.4	0.18	74.9
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	2 GW Protection	10.2 GW & River Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	NO	YES
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen	Date 07/13/11	Calc. No. 0100H-CA-V0178	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked J. D. Skoglie	Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 19 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area D**

	Sample	Sample	Sample	Manganese			Mercury			Molybdenum			Nickel			Vanadium			Zinc			TPH - motor oil			Acenapthene			Benzo(a)anthracene			Benzo(a)pyrene		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	D5	J1B8C0	6/29/10	369		0.793	0.029	U	0.029	0.352	B	0.793	13.0	J	1.98	47.8	J	0.793	42.5		2.38	9950	UJ	9950	3.36	U	3.36	3.36	UJ	3.36	3.36	UJ	3.36
6	Duplicate of J1B8C0	J1B8C8	6/29/10	374		0.749	0.032	U	0.032	0.302	B	0.749	13.3	J	1.87	49.0	J	0.749	43.9		2.25	10700	UJ	10700	3.48	U	3.48	3.48	UJ	3.48	3.48	UJ	3.48
7	D1	J1B8B6	6/29/10	326		0.743	0.027	U	0.027	0.288	B	0.743	11.8	J	1.86	41.7	J	0.743	42.6		2.23	9900	UJ	9900	3.28	U	3.28	3.28	UJ	3.28	3.28	UJ	3.28
8	D2	J1B8B7	6/29/10	222		0.990	1.07		0.030	0.315	B	0.990	9.91	J	2.48	39.4	J	0.990	38.7		2.97	29300	J	10000	19.4		3.38	22.6	J	3.38	11.0	J	3.38
9	D3	J1B8B8	6/29/10	284		0.677	0.026	U	0.026	0.242	B	0.677	11.2	J	1.69	39.8	J	0.677	37		2.03	6970	J	10000	3.31	U	3.31	1.84	J	3.31	3.31	UJ	3.31
10	D4	J1B8B9	6/29/10	310		0.881	0.020	B	0.030	0.524	B	0.881	11.5	J	2.20	58.4	J	0.881	40.7		2.64	4970	J	10400	3.58	U	3.58	3.58	UJ	3.58	3.58	UJ	3.58
11	D6	J1B8C1	6/29/10	267		0.798	0.035		0.030	0.389	B	0.798	11.1	J	2.00	48.4	J	0.798	36.9		2.40	3590	J	9800	2.31	J	3.30	2.59	J	3.30	3.52	J	3.30
12	D7	J1B8C2	6/29/10	333		0.680	0.024	U	0.024	0.327	B	0.680	10.0	J	1.70	52.5	J	0.680	39.5		2.04	4800	J	10100	9.82		3.38	3.38	UJ	3.38	3.38	UJ	3.38
13	D8	J1B8C3	6/29/10	282		0.680	0.010	B	0.030	0.427	B	0.680	10.5	J	1.70	58.2	J	0.680	36.3		2.04	6810	J	9950	3.35	U	3.35	3.35	UJ	3.35	3.35	UJ	3.35
14	D9	J1B8C4	6/29/10	343		0.806	0.030	U	0.030	0.329	B	0.806	11.2	J	2.01	43.0	J	0.806	39.9		2.42	10200	UJ	10200	3.44	U	3.44	6.21	J	3.44	7.91	J	3.44
15	D10	J1B8C5	6/29/10	275		0.822	0.048		0.030	0.481	B	0.822	10.4	J	2.05	49.4	J	0.822	42.8		2.47	25100	J	9630	15.6		3.32	5.09	J	3.32	8.22	J	3.32
16	D11	J1B8C6	6/29/10	277		0.635	0.0080	B	0.020	0.459	B	0.635	12.3	J	1.59	45.7	J	0.635	38.5		1.90	66700	J	9810	34.0		3.28	19.1	J	3.28	24.3	J	3.28
17	D12	J1B8C7	6/29/10	284		0.757	0.029	U	0.029	0.302	B	0.757	10.5	J	1.89	50.2	J	0.757	36.5		2.27	6450	J	9650	2.87	J	3.19	2.65	J	3.19	1.59	J	3.19

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Mercury	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Acenapthene	Benzo(a)anthracene	Benzo(a)pyrene
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	D5	J1B8C0/ J1B8C8	6/29/10	372	0.015	0.327	13.2	48.4	43.2	5163	1.71	1.71	1.71
23	D1	J1B8B6	6/29/10	326	0.014	0.288	11.8	41.7	42.6	4950	1.64	1.64	1.64
24	D2	J1B8B7	6/29/10	222	1.07	0.315	9.91	39.4	38.7	29300	19.4	22.6	11.0
25	D3	J1B8B8	6/29/10	284	0.013	0.242	11.2	39.8	37.0	6970	1.66	1.84	1.66
26	D4	J1B8B9	6/29/10	310	0.020	0.524	11.5	58.4	40.7	4970	1.79	1.79	1.79
27	D6	J1B8C1	6/29/10	267	0.035	0.389	11.1	48.4	36.9	3590	2.31	2.59	3.52
28	D7	J1B8C2	6/29/10	333	0.012	0.327	10.0	52.5	39.5	4800	9.82	1.69	1.69
29	D8	J1B8C3	6/29/10	282	0.010	0.427	10.5	58.2	36.3	6810	1.68	1.68	1.68
30	D9	J1B8C4	6/29/10	343	0.015	0.329	11.2	43.0	39.9	5100	1.72	6.21	7.91
31	D10	J1B8C5	6/29/10	275	0.048	0.481	10.4	49.4	42.8	25100	15.6	5.09	8.22
32	D11	J1B8C6	6/29/10	277	0.008	0.459	12.3	45.7	38.5	66700	34.0	19.1	24.3
33	D12	J1B8C7	6/29/10	284	0.015	0.302	10.5	50.2	36.5	6450	2.87	2.65	1.59

34 **Statistical Computations**

35		Manganese	Mercury	Molybdenum	Nickel	Vanadium	Zinc	TPH - motor oil	Acenapthene	Benzo(a)anthracene	Benzo(a)pyrene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	50%	0%	0%	0%	0%	25%	50%	42%	50%
39	Mean	298	0.11	0.368	11.1	47.9	39.4	14159	7.85	5.72	5.56
40	Standard deviation	40.4	0.30	0.0872	0.96	6.40	2.51	18601	10.3	7.26	6.76
41	95% UCL on mean	321	0.25	0.420	11.6	51.5	40.7	22992	12.7	9.16	8.77
42	Maximum value	374	1.07	0.524	13.3	58.4	43.9	66700	34.0	22.6	24.3
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	512 GW & River Protection	0.33 GW & River Protection	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	96000 GW Protection	15 GW & River Protection	15 GW & River Protection
44	**WAC 173-340 3-PART TEST**										
45	95% UCL > Cleanup Limit?	NA	NO	NO	NA	NA	NA	NO	NO	NO	NO
46	> 10% above Cleanup Limit?	NA	NO	NO	NA	NA	NA	NO	NO	YES	NO
47	Any sample > 2X Cleanup Limit?	NA	YES	NO	NA	NA	NA	NO	NO	NO	NO
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 20 of 49

1 **128-H-1 Statistical Calculations**
2 **Verification Data - Area D**

	Sample	Sample	Sample	Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
3/4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	D5	J1B8C0	6/29/10	3.36	UJ	3.36	3.36	UJ	3.36	3.36	U	3.36	3.36	UJ	3.36	3.36	UJ	3.36	3.36	U	3.36	3.36	UJ	3.36
6	Duplicate of J1B8C0	J1B8C8	6/29/10	3.48	UJ	3.48	3.48	UJ	3.48	3.48	U	3.48	3.48	UJ	3.48	3.48	UJ	3.48	3.48	U	3.48	3.48	UJ	3.48
7	D1	J1B8B6	6/29/10	3.28	UJ	3.28	3.28	UJ	3.28	3.28	U	3.28	3.28	UJ	3.28	3.28	UJ	3.28	3.28	U	3.28	3.28	UJ	3.28
8	D2	J1B8B7	6/29/10	14.3	J	3.38	7.96	J	3.38	4.70		3.38	42.4	J	3.38	3.38	UJ	3.38	25.7		3.38	5.66	J	3.38
9	D3	J1B8B8	6/29/10	3.31	UJ	3.31	3.31	UJ	3.31	3.31	U	3.31	2.49	J	3.31	4.76	J	3.31	2.15	J	3.31	1.69	J	3.31
10	D4	J1B8B9	6/29/10	3.58	UJ	3.58	1.06	J	3.58	3.58	U	3.58	5.19	J	3.58	2.33	J	3.58	0.967	J	3.58	1.09	J	3.58
11	D6	J1B8C1	6/29/10	5.39	J	3.30	2.97	J	3.30	1.78	J	3.30	28.2	J	3.30	2.00	J	3.30	5.45		3.30	6.77	J	3.30
12	D7	J1B8C2	6/29/10	3.38	UJ	3.38	3.38	UJ	3.38	3.38	U	3.38	2.20	J	3.38	2.01	J	3.38	1.02	J	3.38	3.38	UJ	3.38
13	D8	J1B8C3	6/29/10	3.35	UJ	3.35	3.35	UJ	3.35	3.35	U	3.35	27.3	J	3.35	3.35	UJ	3.35	3.35	U	3.35	3.35	UJ	3.35
14	D9	J1B8C4	6/29/10	4.75	J	3.44	4.56	J	3.44	2.75	J	3.44	16.0	J	3.44	4.68	J	3.44	5.68		3.44	12.6	J	3.44
15	D10	J1B8C5	6/29/10	9.58	J	3.32	6.44	J	3.32	3.34		3.32	27.6	J	3.32	4.19	J	3.32	9.15		3.32	16.3	J	3.32
16	D11	J1B8C6	6/29/10	27.9	J	3.28	15.9	J	3.28	9.49		3.28	57.3	J	3.28	13.7	J	3.28	19.5		3.28	58.6	J	3.28
17	D12	J1B8C7	6/29/10	1.59	J	3.19	1.28	J	3.19	0.93	J	3.19	3.35	J	3.19	1.67	J	3.19	1.12	J	3.19	2.95	J	3.19

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19 **Statistical Computation Input Data**

	Sample	Sample	Sample	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
20/21	Area	Number	Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	D5	J1B8C0/ J1B8C8	6/29/10	1.71	1.71	1.71	1.71	1.71	1.71	1.71
23	D1	J1B8B6	6/29/10	1.64	1.64	1.64	1.64	1.64	1.64	1.64
24	D2	J1B8B7	6/29/10	14.3	7.96	4.70	42.4	1.69	25.7	5.66
25	D3	J1B8B8	6/29/10	1.66	1.66	1.66	2.49	4.76	2.15	1.69
26	D4	J1B8B9	6/29/10	1.79	1.06	1.79	5.19	2.33	0.97	1.09
27	D6	J1B8C1	6/29/10	5.39	2.97	1.78	28.2	2.00	5.45	6.77
28	D7	J1B8C2	6/29/10	1.69	1.69	1.69	2.20	2.01	1.02	1.69
29	D8	J1B8C3	6/29/10	1.68	1.68	1.68	27.3	1.68	1.68	1.68
30	D9	J1B8C4	6/29/10	4.75	4.56	2.75	16.0	4.68	5.68	12.6
31	D10	J1B8C5	6/29/10	9.58	6.44	3.34	27.6	4.19	9.15	16.3
32	D11	J1B8C6	6/29/10	27.9	15.9	9.49	57.3	13.7	19.5	58.6
33	D12	J1B8C7	6/29/10	1.59	1.28	0.93	3.35	1.67	1.12	2.95

34 **Statistical Computations**

35		Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12
38	% < Detection limit	50%	42%	50%	17%	33%	25%	33%
39	Mean	6.14	4.05	2.76	17.9	3.50	6.31	9.36
40	Standard deviation	7.94	4.35	2.35	18.7	3.44	8.11	16.3
41	95% UCL on mean	9.91	6.11	3.88	26.8	5.14	10.2	17.1
42	Maximum value	27.9	15.9	9.49	57.3	13.7	25.7	58.6
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	15 GW & River Protection	48000 GW & River Protection	15 GW & River Protection	18000 River Protection	330 GW & River Protection	240000 GW Protection	48000 GW Protection
44	**WAC 173-340 3-PART TEST**							
45	95% UCL > Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO
46	> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0118
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 21 of 49

1 **128-H-1 Maximum Calculations**
2 **Verification Data - Area D**

	Sample	Sample	Sample	TPH - diesel range			Acenapthylene			Anthracene			Chrysene			Dibenz(a,h)anthracene		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	D5	J1B8C0	6/29/10	3320	U	3320	3.36	U	3.36	3.36	U	3.36	3.36	UJ	3.36	3.36	U	3.36
6	Duplicate of J1B8C0	J1B8C8	6/29/10	3580	U	3580	3.48	U	3.48	3.48	U	3.48	3.48	UJ	3.48	3.48	U	3.48
7	D1	J1B8B6	6/29/10	3300	U	3300	3.28	U	3.28	3.28	U	3.28	3.28	UJ	3.28	3.28	U	3.28
8	D2	J1B8B7	6/29/10	8970		3350	3.38	U	3.38	3.38	U	3.38	14.2	J	3.38	3.38	U	3.38
9	D3	J1B8B8	6/29/10	3340	U	3340	3.31	U	3.31	3.31	U	3.31	3.31	UJ	3.31	3.31	U	3.31
10	D4	J1B8B9	6/29/10	3470	U	3470	3.58	U	3.58	3.58	U	3.58	3.58	UJ	3.58	3.58	U	3.58
11	D6	J1B8C1	6/29/10	1060	J	3270	3.3	U	3.30	3.30	U	3.30	3.30	UJ	3.30	3.30	U	3.30
12	D7	J1B8C2	6/29/10	3370	U	3370	3.38	U	3.38	3.38	U	3.38	3.38	UJ	3.38	3.38	U	3.38
13	D8	J1B8C3	6/29/10	925	J	3320	3.35	U	3.35	3.35	U	3.35	3.35	UJ	3.35	3.35	U	3.35
14	D9	J1B8C4	6/29/10	3400	U	3400	3.44	U	3.44	3.44	U	3.44	5.40	J	3.44	3.44	U	3.44
15	D10	J1B8C5	6/29/10	5210		3210	21.6		3.32	3.32	U	3.32	8.37	J	3.32	1.10	J	3.32
16	D11	J1B8C6	6/29/10	28800		3270	66.2		3.28	1.31	J	3.28	17.9	J	3.3	2.59	J	3.28
17	D12	J1B8C7	6/29/10	3210	U	3210	3.19	U	3.19	3.19	U	3.19	1.13	J	3.19	3.19	U	3.19

3	Sample	Sample	Fluorene			Napthalene			4,4'-DDE			Aroclor-1254			Aroclor-1260		
4	Area	Number	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	D5	J1B8C0	3.36	U	3.36	3.36	U	3.36	1.33	UD	1.33	13.2	U	13.2	13.2	U	13.2
6	Duplicate of J1B8C0	J1B8C8	3.48	U	3.48	3.48	U	3.48	1.42	UD	1.42	14.2	U	14.2	14.2	U	14.2
7	D1	J1B8B6	3.28	U	3.28	3.28	U	3.28	1.34	UD	1.34	13.4	U	13.4	13.4	U	13.4
8	D2	J1B8B7	3.38	U	3.38	3.38	U	3.38	2.46	JD	2.46	9.43	J	13.2	19.2		13.2
9	D3	J1B8B8	3.31	U	3.31	3.31	U	3.31	1.33	UD	1.33	13.3	U	13.3	13.3	U	13.3
10	D4	J1B8B9	3.58	U	3.58	3.58	U	3.58	1.43	UD	1.43	14.3	U	14.3	14.3	U	14.3
11	D6	J1B8C1	3.30	U	3.30	3.30	U	3.30	1.54	JD	1.54	13.3	U	13.3	13.3	U	13.3
12	D7	J1B8C2	3.38	U	3.38	3.38	U	3.38	1.33	UD	1.33	13.3	U	13.3	13.3	U	13.3
13	D8	J1B8C3	3.35	U	3.35	3.35	U	3.35	1.34	UD	1.34	13.4	U	13.4	13.4	U	13.4
14	D9	J1B8C4	3.44	U	3.44	3.44	U	3.44	1.36	UD	1.36	13.6	U	13.6	13.6	U	13.6
15	D10	J1B8C5	1.10	J	3.32	3.32	U	3.32	2.02	JD	2.02	13.2	U	13.2	13.2	U	13.2
16	D11	J1B8C6	4.27		3.28	6.57		3.28	1.35	UD	1.35	13.5	U	13.5	13.5	U	13.5
17	D12	J1B8C7	3.19	U	3.19	3.19	U	3.19	1.34	UD	1.34	13.4	U	13.4	13.4	U	13.4

18 **Statistical Computations**

19		TPH - diesel range	Acenapthylene	Anthracene	Chrysene	Dibenz(a,h)anthracene
20	% < Detection limit	58%	83%	92%	58%	83%
21	Maximum value	28800	66.2	1.31	17.9	2.59
22	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	200000 DE, GW, & River Protection	96000 GW Protection	240000 GW Protection	100 River Protection	30 GW & River Protection
23	**3-PART TEST**					
24	Maximum > Cleanup Limit?	NO	NO	NO	NO	NO
25	> 10% above Cleanup Limit?	NO	NO	NO	NO	NO
26	Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO
27	**3-Part Test Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

19		Fluorene	Napthalene	4,4'-DDE	Aroclor-1254	Aroclor-1260
20	% < Detection limit	83%	92%	75%	92%	92%
21	Maximum value	4.27	6.57	2.46	9.43	19.2
22	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	64000 GW Protection	16.0 GW Protection	3.3 River Protection	17 GW & River Protection	17 GW & River Protection
23	**3-PART TEST**					
24	Maximum > Cleanup Limit?	NO	NO	NO	NO	YES
25	> 10% above Cleanup Limit?	NO	NO	NO	NO	NO
26	Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO
27	**3-Part Test Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

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CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 22 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area E**

Row	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Boron mg/kg	Boron Q	Boron PQL	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL	Copper mg/kg	Copper Q	Copper PQL	Lead mg/kg	Lead Q	Lead PQL
5	E-6	J1JCT4	5/31/11	5.9		0.57	88.2		0.065	2.8		0.84	0.11	B	0.035	12.4		0.050	6.8		0.086	13.2	X	0.19	5.7		0.23
6	Duplicate of J1JCT4	J1JCV1	5/31/11	6.0		0.64	87.8		0.074	2.7		0.95	0.11	B	0.040	13.5		0.056	6.9		0.097	13.2	X	0.21	5.4		0.26
7	E-1	J1JCR9	5/31/11	3.7	M	0.72	60.7		0.083	1.1	B	1.1	0.063	B	0.045	11.0		0.063	6.9		0.11	15.9	X	0.24	3.0		0.29
8	E-2	J1JCT0	5/31/11	2.2		0.58	51.4		0.067	0.98	B	0.86	0.064	B	0.036	16.5		0.051	5.9		0.088	15.0	X	0.19	4.9		0.24
9	E-3	J1JCT1	5/31/11	2.5		0.66	71.2		0.076	1.3	B	0.98	0.086	B	0.041	10.7		0.058	7.6		0.10	17.4	X	0.22	4.2		0.27
10	E-4	J1JCT2	5/31/11	1.7		0.61	49.7		0.070	0.91	U	0.91	0.041	B	0.038	9.70		0.054	5.8		0.093	13.6	X	0.2	2.6		0.25
11	E-5	J1JCT3	5/31/11	4.1		0.57	52.6		0.066	0.85	U	0.85	0.041	B	0.036	9.40		0.050	5.1		0.087	21.9	X	0.19	6.5		0.24
12	E-7	J1JCT5	5/31/11	3.1		0.64	52.6		0.073	0.94	U	0.94	0.048	B	0.040	10.8		0.056	5.2		0.096	14.2	X	0.21	8.1		0.26
13	E-8	J1JCT6	5/31/11	2.9		0.61	70.7		0.071	1.3	B	0.91	0.076	B	0.038	13.3		0.054	6.3		0.093	13.1	X	0.20	4.9		0.25
14	E-9	J1JCT7	5/31/11	2.7		0.63	49.8		0.073	0.94	U	0.94	0.039	U	0.039	11.0		0.056	5.7		0.096	14.5	X	0.21	4.5		0.26
15	E-10	J1JCT8	5/31/11	4.5		0.64	74.0		0.074	1.6	B	0.95	0.083	B	0.040	11.8		0.056	5.8		0.097	10.7	X	0.21	11.6		0.26
16	E-11	J1JCT9	5/31/11	2.5		0.63	41.6		0.073	0.94	U	0.94	0.042	B	0.039	12.8		0.056	5.6		0.096	16.1	X	0.21	3.2		0.26
17	E-12	J1JCV0	5/31/11	1.7		0.67	43.6		0.077	0.99	U	0.99	0.045	B	0.041	9.6		0.058	6.6		0.10	15.9	X	0.22	2.8		0.27

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19 **Statistical Computation Input Data**

Row	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg
22	E-6	J1JCT4/ J1JCV1	5/31/11	6.0	88.0	2.8	0.11	13.0	6.9	13.2	5.6
23	E-1	J1JCR9	5/31/11	3.7	60.7	1.1	0.063	11.0	6.9	15.9	3.0
24	E-2	J1JCT0	5/31/11	2.2	51.4	0.98	0.064	16.5	5.9	15.0	4.9
25	E-3	J1JCT1	5/31/11	2.5	71.2	1.3	0.086	10.7	7.6	17.4	4.2
26	E-4	J1JCT2	5/31/11	1.7	49.7	0.46	0.041	9.7	5.8	13.6	2.6
27	E-5	J1JCT3	5/31/11	4.1	52.6	0.43	0.041	9.4	5.1	21.9	6.5
28	E-7	J1JCT5	5/31/11	3.1	52.6	0.47	0.048	10.8	5.2	14.2	8.1
29	E-8	J1JCT6	5/31/11	2.9	70.7	1.3	0.076	13.3	6.3	13.1	4.9
30	E-9	J1JCT7	5/31/11	2.7	49.8	0.47	0.020	11.0	5.7	14.5	4.5
31	E-10	J1JCT8	5/31/11	4.5	74.0	1.6	0.083	11.8	5.8	10.7	11.6
32	E-11	J1JCT9	5/31/11	2.5	41.6	0.47	0.042	12.8	5.6	16.1	3.2
33	E-12	J1JCV0	5/31/11	1.7	43.6	0.50	0.045	9.6	6.6	15.9	2.8

34 **Statistical Computations**

Row		Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	50%	8%	0%	0%	0%	0%
39	Mean	3.1	58.8	0.98	0.060	11.6	6.1	15.1	5.2
40	Standard deviation	1.2	14.2	0.70	0.025	2.0	0.75	2.77	2.6
41	95% UCL on mean	4.0	67.1	1.3	0.082	12.7	6.5	16.7	6.9
42	Maximum value	6.0	88.2	2.8	0.11	16.5	7.6	21.9	11.6
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection
44	WAC 173-340 3-PART TEST								
45	95% UCL > Cleanup Limit?	NA	NA	NO	NA	NA	NA	NA	NO
46	> 10% above Cleanup Limit?	NA	NA	NO	NA	NA	NA	NA	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NO	NA	NA	NA	NA	NO
48	WAC 173-340 Compliance?	Because all values are below background (6.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen **Date** 07/13/11 **Calc. No.** 0100H-CA-V0178 **Rev. No.** 0

Project 100-H Field Remediation **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 23 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area E**

3	Sample	Sample	Sample	Manganese			Mercury			Nickel			Vanadium			Zinc			TPH - motor oil			Bis(2-ethylhexyl)phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	E-6	J1JCT4	5/31/11	324		0.086	0.0076	B	0.0053	11.4		0.11	35.9		0.081	39.6	X	0.34	1600	J	1000	76	JB	47
6	Duplicate of J1JCT4	J1JCV1	5/31/11	310		0.097	0.074		0.0057	11.7		0.12	38.0		0.091	40.5	X	0.39	980	U	980	66	JB	45
7	E-1	J1JCR9	5/31/11	284		0.11	0.0057	U	0.0057	10.6	M	0.13	46.6		0.10	35.1	X	0.43	1100	U	1100	51	U	51
8	E-2	J1JCT0	5/31/11	230		0.088	0.0054	B	0.0051	13.6		0.11	38.1		0.083	34.0	X	0.35	380000		990	45	U	45
9	E-3	J1JCT1	5/31/11	331		0.10	0.0063	B	0.0055	11.9		0.12	41.8		0.094	37.5	X	0.40	1000	U	1000	76	JB	45
10	E-4	J1JCT2	5/31/11	225		0.093	0.0072	B	0.0056	9.1		0.11	37.8		0.087	29.8	X	0.37	12000		980	74	JB	46
11	E-5	J1JCT3	5/31/11	203		0.087	0.0055	U	0.0055	9.9		0.11	36.0		0.082	30.9	X	0.35	2700	J	990	70	JB	44
12	E-7	J1JCT5	5/31/11	197		0.096	0.011	B	0.0049	9.4		0.12	36.3		0.091	31.8	X	0.38	1900	J	1000	77	JB	46
13	E-8	J1JCT6	5/31/11	266		0.093	0.0049	U	0.0049	12.3		0.11	35.6		0.087	39.0	X	0.37	1000	U	1000	74	JB	45
14	E-9	J1JCT7	5/31/11	201		0.096	0.0054	U	0.0054	10.2		0.12	41.0		0.090	31.5	X	0.38	960	U	960	75	JB	45
15	E-10	J1JCT8	5/31/11	251		0.097	0.0054	U	0.0054	10.6		0.12	33.8		0.091	34.1	X	0.39	1900	J	1000	69	JB	46
16	E-11	J1JCT9	5/31/11	212		0.096	0.0062	B	0.0055	11.0		0.12	37.3		0.090	31.2	X	0.38	1000	J	1000	74	JB	46
17	E-12	J1JCV0	5/31/11	236		0.10	0.0056	U	0.0056	9.8		0.12	44.0		0.095	37.0	X	0.40	1000	U	1000	72	JB	45

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Mercury	Nickel	Vanadium	Zinc	TPH - motor oil	Bis(2-ethylhexyl)phthalate
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg
22	E-6	J1JCT4/ J1JCV1	5/31/11	317	0.041	11.6	37.0	40.1	1045	71
23	E-1	J1JCR9	5/31/11	284	0.0029	10.6	46.6	35.1	550	26
24	E-2	J1JCT0	5/31/11	230	0.0054	13.6	38.1	34.0	380000	23
25	E-3	J1JCT1	5/31/11	331	0.0063	11.9	41.8	37.5	500	76
26	E-4	J1JCT2	5/31/11	225	0.0072	9.1	37.8	29.8	12000	74
27	E-5	J1JCT3	5/31/11	203	0.0028	9.9	36.0	30.9	2700	70
28	E-7	J1JCT5	5/31/11	197	0.011	9.4	36.3	31.8	1900	77
29	E-8	J1JCT6	5/31/11	266	0.0025	12.3	35.6	39.0	500	74
30	E-9	J1JCT7	5/31/11	201	0.0027	10.2	41.0	31.5	480	75
31	E-10	J1JCT8	5/31/11	251	0.0027	10.6	33.8	34.1	1900	69
32	E-11	J1JCT9	5/31/11	212	0.0062	11.0	37.3	31.2	1000	74
33	E-12	J1JCV0	5/31/11	236	0.0028	9.8	44.0	37.0	500	72

34 **Statistical Computations**

35		Manganese		Mercury		Nickel		Vanadium		Zinc		TPH - motor oil		Bis(2-ethylhexyl)phthalate	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	
37	N	12		12		12		12		12		12		12	
38	% < Detection limit	0%		50%		0%		0%		0%		42%		17%	
39	Mean	246		0.0078		10.8		38.8		34.3		33590		65	
40	Standard deviation	45.1		0.011		1.31		3.8		3.4		109138		19	
41	95% UCL on mean	271		0.013		11.5		40.8		36.2		85416		74	
42	Maximum value	331		0.074		13.6		46.6		40.5		380000		77	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	512	GW & River Protection	0.33	GW & River Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection	200000	DE, GW, & River Protection	360	River Protection
44	**WAC 173-340 3-PART TEST**														
45	95% UCL > Cleanup Limit?	NA		NA		NA		NA		NA		NO		NO	
46	> 10% above Cleanup Limit?	NA		NA		NA		NA		NA		NO		NO	
47	Any sample > 2X Cleanup Limit?	NA		NA		NA		NA		NA		NO		NO	
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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128-H-1 Maximum Calculations

Verification Data - Area E

Sample	Sample	Sample	Beryllium			Hexavalent chromium			Molybdenum			TPH - diesel range			Benzo(a)anthracene			Benzo(b)fluoranthene			Chrysene			Fluoranthene			Pyrene		
Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
E-6	J1JCT4	5/31/11	0.16	B	0.028	0.154	U	0.154	0.22	U	0.22	690	U	690	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
Duplicate of J1JCT4	J1JCV1	5/31/11	0.17	B	0.032	0.154	U	0.154	0.25	U	0.25	660	U	660	3.2	U	3.2	4.2	U	4.2	4.8	U	4.8	13	U	13	12	U	12
E-1	J1JCR9	5/31/11	0.036	U	0.036	0.155	U	0.155	0.49	B	0.28	770	U	770	3.6	U	3.6	4.8	U	4.8	5.5	U	5.5	15	U	15	14	U	14
E-2	J1JCT0	5/31/11	0.029	U	0.029	0.917		0.154	0.23	U	0.23	160000		670	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
E-3	J1JCT1	5/31/11	0.066	B	0.033	0.154	U	0.154	0.26	U	0.26	680	U	680	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
E-4	J1JCT2	5/31/11	0.031	U	0.031	0.155	U	0.155	0.24	U	0.24	3700	J	670	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
E-5	J1JCT3	5/31/11	0.029	U	0.029	0.154	U	0.154	0.23	U	0.23	670	U	670	3.2	U	3.2	4.2	U	4.2	4.9	U	4.9	13	U	13	12	U	12
E-7	J1JCT5	5/31/11	0.032	U	0.032	0.154	U	0.154	0.25	U	0.25	680	U	680	3.2	U	3.2	4.2	U	4.2	4.8	U	4.8	13	U	13	12	U	12
E-8	J1JCT6	5/31/11	0.13	B	0.031	0.154	U	0.154	0.24	U	0.24	680	U	680	3.1	U	3.1	4.1	U	4.1	4.7	U	4.7	13	U	13	12	U	12
E-9	J1JCT7	5/31/11	0.032	U	0.032	0.153	U	0.153	0.25	U	0.25	650	U	650	3.1	U	3.1	4.1	U	4.1	4.8	U	4.8	13	U	13	12	U	12
E-10	J1JCT8	5/31/11	0.11	B	0.032	0.155	U	0.155	0.25	U	0.25	680	U	680	12	J	3.3	13	J	4.3	15	J	4.9	23	J	13	30	J	12
E-11	J1JCT9	5/31/11	0.068	B	0.032	0.154	U	0.154	0.25	U	0.25	690	U	690	3.2	U	3.2	4.3	U	4.3	4.9	U	4.9	13	U	13	12	U	12
E-12	J1JCV0	5/31/11	0.033	U	0.033	0.154	U	0.154	0.26	U	0.26	680	U	680	3.1	U	3.1	4.1	U	4.1	4.7	U	4.7	13	U	13	12	U	12

Statistical Computations

	Beryllium	Hexavalent chromium	Molybdenum	TPH - diesel range	Benzo(a)anthracene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Pyrene
% < Detection limit	58%	92%	92%	83%	92%	92%	92%	92%	92%
Maximum value	0.17	0.917	0.49	160000	12	13	15	23	30
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	1.51 GW & River Protection	2 GW Protection	8 GW Protection	200000 DE, GW & River Protection	15 GW & River Protection	15 GW & River Protection	100 River Protection	18000 River Protection	48000 GW Protection
3-PART TEST									
Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
3-Part Test Compliance?	Because all values are below background (1.51 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

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128-H-1 Statistical Calculations

Verification Data - Area F

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Arsenic Q	Arsenic PQL	Barium mg/kg	Barium Q	Barium PQL	Beryllium mg/kg	Beryllium Q	Beryllium PQL	Boron mg/kg	Boron Q	Boron PQL
F-2	J1JCV3	5/26/11	3.9		0.65	93.4		0.075	0.27		0.033	2.1		0.97
Duplicate of J1JCV3	J1JCW4	5/26/11	3.9		0.66	89.4		0.076	0.27		0.033	2.0		0.98
F-1	J1JCV2	5/26/11	3.8		0.65	84.3		0.075	0.25		0.032	1.5	B	0.96
F-3	J1JCV4	5/26/11	3.4		0.63	84.9		0.073	0.27		0.032	1.4	B	0.94
F-4	J1JCV5	5/26/11	3.4		0.63	93.9		0.073	0.26		0.032	1.9		0.94
F-5	J1JCV6	5/26/11	4.0		0.6	89.1		0.069	0.28		0.030	1.4	B	0.89
F-6	J1JCV7	5/26/11	4.1		0.68	97.6		0.078	0.29		0.034	1.6	B	1.0
F-7	J1JCV8	5/26/11	3.3		0.61	96.7		0.070	0.28		0.031	1.6	B	0.91
F-8	J1JCV9	5/26/11	3.4		0.65	74.3		0.075	0.23		0.032	1.4	B	0.96
F-9	J1JCW0	5/26/11	3.4		0.61	72.6		0.070	0.24		0.030	1.5	B	0.90
F-10	J1JCW1	5/26/11	3.4		0.67	67.3		0.077	0.22		0.034	1.8	B	1.0
F-11	J1JCW2	5/26/11	3.2		0.61	64.7		0.071	0.17	B	0.031	1.3	B	0.91
F-12	J1JCW3	5/26/11	3.6		0.59	88.9		0.068	0.29		0.030	1.9		0.88

Sample Number	Cadmium mg/kg	Cadmium Q	Cadmium PQL	Chromium mg/kg	Chromium Q	Chromium PQL	Cobalt mg/kg	Cobalt Q	Cobalt PQL	Copper mg/kg	Copper Q	Copper PQL	Lead mg/kg	Lead Q	Lead PQL
J1JCV3	0.091	B	0.041	12.2		0.057	7.0	X	0.099	12.5	0	0.21	5.4		0.27
J1JCW4	0.087	B	0.041	12.7		0.058	6.9	X	0.10	13.0	0	0.22	5.2		0.27
J1JCV2	0.083	B	0.040	12.6		0.057	7.1	X	0.098	14.0	0	0.21	6.7		0.27
J1JCV4	0.082	B	0.039	15.2		0.056	7.1	X	0.096	14.1	0	0.21	5.5		0.26
J1JCV5	0.11	B	0.039	12.5		0.056	7.0	X	0.096	11.6	0	0.21	5.4		0.26
J1JCV6	0.070	B	0.037	12.4		0.053	7.4	X	0.091	13.8	0	0.2	5.6		0.25
J1JCV7	0.094	B	0.042	15.0		0.060	7.4	X	0.10	13.2	0	0.22	5.7		0.28
J1JCV8	0.097	B	0.038	12.5		0.054	7.6	X	0.092	13.4	0	0.200	5.8		0.25
J1JCV9	0.080	B	0.040	11.7		0.057	6.8	X	0.098	15	0	0.210	5.3		0.26
J1JCW0	0.076	B	0.038	11.8		0.053	7.0	X	0.092	14.1	0	0.200	5.5		0.25
J1JCW1	0.086	B	0.042	18.0		0.059	7.2	X	0.10	17.3	0	0.22	5.3		0.27
J1JCW2	0.069	B	0.038	9.3		0.054	6.4	X	0.093	15.1	0	0.2	3.9		0.25
J1JCW3	0.085	B	0.037	12.9		0.052	7.7	X	0.089	14.9	0	0.19	6.1		0.24

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg
F-2	J1JCV3/ J1JCW4	5/26/11	3.9	91.4	0.27	2.1	0.089	12.5	7.0	12.8	5.3
F-1	J1JCV2	5/26/11	3.8	84.3	0.25	1.5	0.083	12.6	7.1	14.0	6.7
F-3	J1JCV4	5/26/11	3.4	84.9	0.27	1.4	0.082	15.2	7.1	14.1	5.5
F-4	J1JCV5	5/26/11	3.4	93.9	0.26	1.9	0.11	12.5	7.0	11.6	5.4
F-5	J1JCV6	5/26/11	4.0	89.1	0.28	1.4	0.070	12.4	7.4	13.8	5.6
F-6	J1JCV7	5/26/11	4.1	97.6	0.29	1.6	0.094	15.0	7.4	13.2	5.7
F-7	J1JCV8	5/26/11	3.3	96.7	0.28	1.6	0.097	12.5	7.6	13.4	5.8
F-8	J1JCV9	5/26/11	3.4	74.3	0.23	1.4	0.080	11.7	6.8	15.0	5.3
F-9	J1JCW0	5/26/11	3.4	72.6	0.24	1.5	0.076	11.8	7.0	14.1	5.5
F-10	J1JCW1	5/26/11	3.4	67.3	0.22	1.8	0.086	18.0	7.2	17.3	5.3
F-11	J1JCW2	5/26/11	3.2	64.7	0.17	1.3	0.069	9.3	6.4	15.1	3.9
F-12	J1JCW3	5/26/11	3.6	88.9	0.29	1.9	0.085	12.9	7.7	14.9	6.1

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mean	3.6	83.8	0.25	1.6	0.085	13.0	7.1	14.1	5.5
Standard deviation	0.30	11.4	0.035	0.24	0.012	2.2	0.36	1.42	0.65
95% UCL on mean	3.7	90.6	0.27	1.7	0.092	14.1	7.3	14.9	5.8
Maximum value	4.1	97.6	0.29	2.1	0.11	18.0	7.7	17.3	6.7
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection
WAC 173-340 3-PART TEST									
95% UCL > Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA	NA
WAC 173-340 Compliance?	Because all values are below background (6.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (10.2 mg/kg) the WAC 173-340 3-part test is not required.

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Originator T. E. Queen	**Date** 07/13/11	**Calc. No.** 0100H-CA-V0178	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** J. D. Skoglie	**Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 26 of 49

1 **128-H-1 Statistical Calculations**

2 **Verification Data - Area F**

3	Sample	Sample	Sample	Manganese			Nickel			Vanadium			Zinc			TPH - diesel range			TPH - motor oil			Bis(2-ethylhexyl)phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	F-2	J1JCV3	5/26/11	330		0.099	11.9		0.12	38.1		0.093	39.8		0.39	700	U	700	1100	J	1000	47	U	47
6	Duplicate of J1JCV3	J1JCW4	5/26/11	329		0.10	12.4		0.12	37.8		0.094	40.3		0.40	650	U	650	1200	J	960	76	JB	46
7	F-1	J1JCV2	5/26/11	315		0.098	12.8		0.12	38.5		0.092	38.8		0.39	650	J	650	1400	J	950	46	U	46
8	F-3	J1JCV4	5/26/11	309		0.096	13.9		0.12	38.6		0.090	39.0		0.38	690	U	690	1200	J	1000	77	JB	48
9	F-4	J1JCV5	5/26/11	342		0.096	11.4		0.12	38.7		0.090	41.9		0.38	700	U	700	1100	J	1000	74	JB	49
10	F-5	J1JCV6	5/26/11	326		0.091	12.6		0.11	40.0		0.085	39.6		0.36	660	U	660	1400	J	980	71	JB	45
11	F-6	J1JCV7	5/26/11	359		0.10	14.3		0.13	40.4		0.096	43.8		0.41	690	U	690	1000	J	1000	73	JB	46
12	F-7	J1JCV8	5/26/11	351		0.092	12.4		0.11	41.7		0.087	42.0		0.37	690	U	690	1000	U	1000	66	JB	45
13	F-8	J1JCV9	5/26/11	305		0.098	12.3		0.12	41.0		0.092	37.8		0.39	11000		680	26000		1000	45	U	45
14	F-9	J1JCW0	5/26/11	297		0.092	12.4		0.11	40.1		0.086	37.6		0.37	4300		670	7500		990	46	U	46
15	F-10	J1JCW1	5/26/11	291		0.10	14.9		0.13	42.0		0.096	38.4		0.40	2800	J	660	7600		970	45	U	45
16	F-11	J1JCW2	5/26/11	250		0.093	10.6		0.11	40.1		0.087	33.0		0.37	24000		650	25000		960	44	U	44
17	F-12	J1JCW3	5/26/11	342		0.089	13.2		0.11	41.2		0.084	41.6		0.36	4600		680	8400		1000	46	U	46

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Nickel	Vanadium	Zinc	TPH - diesel range	TPH - motor oil	Bis(2-ethylhexyl)phthalate
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg
22	F-2	J1JCV3/ J1JCW4	5/26/11	330	12.2	38.0	40.1	338	1150	50
23	F-1	J1JCV2	5/26/11	315	12.8	38.5	38.8	650	1400	23
24	F-3	J1JCV4	5/26/11	309	13.9	38.6	39.0	345	1200	77
25	F-4	J1JCV5	5/26/11	342	11.4	38.7	41.9	350	1100	74
26	F-5	J1JCV6	5/26/11	326	12.6	40.0	39.6	330	1400	71
27	F-6	J1JCV7	5/26/11	359	14.3	40.4	43.8	345	1000	73
28	F-7	J1JCV8	5/26/11	351	12.4	41.7	42.0	345	500	66
29	F-8	J1JCV9	5/26/11	305	12.3	41.0	37.8	11000	26000	23
30	F-9	J1JCW0	5/26/11	297	12.4	40.1	37.6	4300	7500	23
31	F-10	J1JCW1	5/26/11	291	14.9	42.0	38.4	2800	7600	23
32	F-11	J1JCW2	5/26/11	250	10.6	40.1	33.0	24000	25000	22
33	F-12	J1JCW3	5/26/11	342	13.2	41.2	41.6	4600	8400	23

34 **Statistical Computations**

35		Manganese	Nickel	Vanadium	Zinc	TPH - diesel range	TPH - motor oil	Bis(2-ethylhexyl)phthalate
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	50%	8%	50%
39	Mean	318	12.7	40.0	39.5	4117	6854	46
40	Standard deviation	30.4	1.2	1.3	2.8	7021	9200	25
41	95% UCL on mean	336	13.4	40.7	41.0	7451	11223	57
42	Maximum value	359	14.9	42.0	43.8	24000	26000	77
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	512 GW & River Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	200000 DE, GW, & River Protection	200000 DE, GW, & River Protection	360 River Protection
44	**WAC 173-340 3-PART TEST**							
45	95% UCL > Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
46	> 10% above Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

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128-H-1 Maximum Calculations

Verification Data - Area F

Sample Area	Sample Number	Sample Date	Hexavalent chromium mg/kg	Q	PQL	Mercury mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	0.265		0.154	0.0053	U	0.0053
Duplicate of J1JCV3	J1JCW4	5/26/11	0.154	U	0.154	0.0052	U	0.0052
F-1	J1JCV2	5/26/11	0.154	U	0.154	0.0073	B	0.0057
F-3	J1JCV4	5/26/11	0.154	U	0.154	0.0057	U	0.0057
F-4	J1JCV5	5/26/11	0.223		0.155	0.0054	U	0.0054
F-5	J1JCV6	5/26/11	0.155	U	0.155	0.0053	U	0.0053
F-6	J1JCV7	5/26/11	0.221		0.155	0.0054	U	0.0054
F-7	J1JCV8	5/26/11	0.154	U	0.154	0.0053	U	0.0053
F-8	J1JCV9	5/26/11	0.154	U	0.154	0.0057	U	0.0057
F-9	J1JCW0	5/26/11	0.154	U	0.154	0.0067	B	0.0057
F-10	J1JCW1	5/26/11	0.154	U	0.154	0.0094	B	0.0050
F-11	J1JCW2	5/26/11	0.155	U	0.155	0.0052	U	0.0052
F-12	J1JCW3	5/26/11	0.154	U	0.154	0.0053	U	0.0053

Statistical Computations

	Hexavalent chromium		Mercury	
% < Detection limit	75%		75%	
Maximum value	0.265		0.0094	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	2	GW Protection	0.33	GW & River Protection
3-PART TEST				
Maximum > Cleanup Limit?	NO		NA	
> 10% above Cleanup Limit?	NO		NA	
Any sample > 2X Cleanup Limit?	NO		NA	
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (0.33 mg/kg) the 3-part test is not required.	

CALCULATION SHEET

Washington Closure Hanford

Originator	T. E. Queen	Date	07/13/11	Calc. No.	0100H-CA-V0178
Project	100-H Field Remediation	Job No.	14655	Checked	J. D. Skoglie
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations	Rev. No.	0	Date	07/13/11
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Ecology Software (MTCAStat) Results, Area A

Arsenic 95% UCL Calculation

DATA	ID
46.4	J1B856/J1B866
15.1	J1B854
23.5	J1B855
56.8	J1B857
31.8	J1B858
42.4	J1B859
29.7	J1B860
33.8	J1B861
40.5	J1JVX2
47.6	J1B863
16.5	J1B864
17.3	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	33.4
Censored		Lognormal mean	33.9
Detection limit or PQL		Std. devn.	13.6
Method detection limit		Median	32.8
TOTAL	12	Min.	15.1
		Max.	56.8

Lognormal distribution? r-squared is: 0.942 | Normal distribution? r-squared is: 0.966

Recommendations: Use lognormal distribution.

UCL (Land's method) is 45.0

Barium 95% UCL Calculation

DATA	ID
79.9	J1B856/J1B866
70.0	J1B854
79.5	J1B855
81.6	J1B857
69.0	J1B858
77.8	J1B859
79.1	J1B860
83.7	J1B861
80.1	J1JVX2
85.5	J1B863
72.1	J1B864
105	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	80.3
Censored		Lognormal mean	80.3
Detection limit or PQL		Std. devn.	9.34
Method detection limit		Median	79.7
TOTAL	12	Min.	69.0
		Max.	105

Lognormal distribution? r-squared is: 0.857 | Normal distribution? r-squared is: 0.812

Recommendations: Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 84.7

Beryllium 95% UCL Calculation

DATA	ID
0.269	J1B856/J1B866
0.219	J1B854
0.302	J1B855
0.276	J1B857
0.271	J1B858
0.275	J1B859
0.241	J1B860
0.253	J1B861
0.210	J1JVX2
0.321	J1B863
0.200	J1B864
0.184	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	0.252
Censored		Lognormal mean	0.252
Detection limit or PQL		Std. devn.	0.0419
Method detection limit		Median	0.261
TOTAL	12	Min.	0.184
		Max.	0.321

Lognormal distribution? r-squared is: 0.965 | Normal distribution? r-squared is: 0.974

Recommendations: Use lognormal distribution.

UCL (Land's method) is 0.277

Boron 95% UCL Calculation

DATA	ID
2.78	J1B856/J1B866
1.96	J1B854
2.37	J1B855
3.20	J1B857
2.53	J1B858
2.79	J1B859
3.17	J1B860
2.58	J1B861
2.80	J1JVX2
2.66	J1B863
2.11	J1B864
1.93	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	2.57
Censored		Lognormal mean	2.58
Detection limit or PQL		Std. devn.	0.421
Method detection limit		Median	2.62
TOTAL	12	Min.	1.93
		Max.	3.20

Lognormal distribution? r-squared is: 0.942 | Normal distribution? r-squared is: 0.955

Recommendations: Use lognormal distribution.

UCL (Land's method) is 2.83

Cadmium 95% UCL Calculation

DATA	ID
0.0670	J1B856/J1B866
0.187	J1B854
0.122	J1B855
0.148	J1B857
0.113	J1B858
0.179	J1B859
0.177	J1B860
0.0910	J1B861
0.290	J1JVX2
0.116	J1B863
0.121	J1B864
0.114	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	0.145
Censored		Lognormal mean	0.146
Detection limit or PQL		Std. devn.	0.0566
Method detection limit		Median	0.122
TOTAL	12	Min.	0.0870
		Max.	0.290

Lognormal distribution? r-squared is: 0.924 | Normal distribution? r-squared is: 0.824

Recommendations: Use lognormal distribution.

UCL (Land's method) is 0.179

Chromium 95% UCL Calculation

DATA	ID
12.1	J1B856/J1B866
10.8	J1B854
14.6	J1B855
13.0	J1B857
12.7	J1B858
13.1	J1B859
11.6	J1B860
12.7	J1B861
12.4	J1JVX2
13.7	J1B863
10.2	J1B864
12.6	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	12.5
Censored		Lognormal mean	12.5
Detection limit or PQL		Std. devn.	1.19
Method detection limit		Median	12.7
TOTAL	12	Min.	10.2
		Max.	14.6

Lognormal distribution? r-squared is: 0.949 | Normal distribution? r-squared is: 0.961

Recommendations: Use lognormal distribution.

UCL (Land's method) is 13.1

Cobalt 95% UCL Calculation

DATA	ID
5.97	J1B856/J1B866
6.37	J1B854
6.69	J1B855
6.16	J1B857
6.14	J1B858
5.95	J1B859
5.47	J1B860
5.92	J1B861
6.60	J1JVX2
6.75	J1B863
6.84	J1B864
6.80	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	6.31
Censored		Lognormal mean	6.31
Detection limit or PQL		Std. devn.	0.437
Method detection limit		Median	6.27
TOTAL	12	Min.	5.47
		Max.	6.84

Lognormal distribution? r-squared is: 0.930 | Normal distribution? r-squared is: 0.935

Recommendations: Use lognormal distribution.

UCL (Land's method) is 6.55

Copper 95% UCL Calculation

DATA	ID
13.4	J1B856/J1B866
13.1	J1B854
13.8	J1B855
12.6	J1B857
12.3	J1B858
12.7	J1B859
12.8	J1B860
12.0	J1B861
14.0	J1JVX2
13.7	J1B863
13.8	J1B864
13.0	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	13.1
Censored		Lognormal mean	13.1
Detection limit or PQL		Std. devn.	0.645
Method detection limit		Median	13.1
TOTAL	12	Min.	12.0
		Max.	14.0

Lognormal distribution? r-squared is: 0.967 | Normal distribution? r-squared is: 0.968

Recommendations: Use lognormal distribution.

UCL (Land's method) is 13.4

Lead 95% UCL Calculation

DATA	ID
138	J1B856/J1B866
73.6	J1B854
84.2	J1B855
406	J1B857
164	J1B858
278	J1B859
319	J1B860
98.0	J1B861
348	J1JVX2
224	J1B863
88.3	J1B864
86.0	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	192
Censored		Lognormal mean	196
Detection limit or PQL		Std. devn.	119
Method detection limit		Median	151
TOTAL	12	Min.	73.6
		Max.	406

Lognormal distribution? r-squared is: 0.918 | Normal distribution? r-squared is: 0.889

Recommendations: Use lognormal distribution.

UCL (Land's method) is 304

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

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Ecology Software (MTCAStat) Results, Area A

Manganese 95% UCL Calculation

DATA	ID				
302	J1B856/ J1B866				
301	J1B854				
329	J1B855	Number of samples		Uncensored values	
331	J1B857	Uncensored	12	Mean	306
304	J1B858	Censored		Lognormal mean	306
300	J1B859	Detection limit or PQL		Std. devn.	15.9
289	J1B860	Method detection limit		Median	302
291	J1B861	TOTAL	12	Min.	282
311	J1JVX2			Max.	331
326	J1B863				
282	J1B864				
302	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.934 r-squared is: 0.928
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 314

Molybdenum 95% UCL Calculation

DATA	ID				
0.311	J1B856/ J1B866				
0.346	J1B854				
0.422	J1B855	Number of samples		Uncensored values	
0.459	J1B857	Uncensored	12	Mean	0.363
0.354	J1B858	Censored		Lognormal mean	0.363
0.337	J1B859	Detection limit or PQL		Std. devn.	0.0515
0.421	J1B860	Method detection limit		Median	0.361
0.368	J1B861	TOTAL	12	Min.	0.280
0.280	J1JVX2			Max.	0.459
0.315	J1B863				
0.369	J1B864				
0.369	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.973 r-squared is: 0.963
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.392

Nickel 95% UCL Calculation

DATA	ID				
10.6	J1B856/ J1B866				
9.50	J1B854				
12.6	J1B855	Number of samples		Uncensored values	
10.4	J1B857	Uncensored	12	Mean	10.5
10.0	J1B858	Censored		Lognormal mean	10.5
10.6	J1B859	Detection limit or PQL		Std. devn.	1.00
11.0	J1B860	Method detection limit		Median	10.5
10.5	J1B861	TOTAL	12	Min.	8.99
10.7	J1JVX2			Max.	12.6
11.7	J1B863				
9.32	J1B864				
8.99	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.960 r-squared is: 0.948
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.0

Vanadium 95% UCL Calculation

DATA	ID				
37.8	J1B856/ J1B866				
50.0	J1B854				
45.6	J1B855	Number of samples		Uncensored values	
43.4	J1B857	Uncensored	12	Mean	44.3
42.8	J1B858	Censored		Lognormal mean	44.3
41.6	J1B859	Detection limit or PQL		Std. devn.	5.19
41.1	J1B860	Method detection limit		Median	43.1
41.3	J1B861	TOTAL	12	Min.	37.8
38.1	J1JVX2			Max.	54.8
44.8	J1B863				
50.7	J1B864				
54.8	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.953 r-squared is: 0.935
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 47.2

Zinc 95% UCL Calculation

DATA	ID				
43.9	J1B856/ J1B866				
40.5	J1B854				
43.0	J1B855	Number of samples		Uncensored values	
50.7	J1B857	Uncensored	12	Mean	46.8
43.8	J1B858	Censored		Lognormal mean	46.8
50.1	J1B859	Detection limit or PQL		Std. devn.	5.05
48.7	J1B860	Method detection limit		Median	45.7
42.0	J1B861	TOTAL	12	Min.	40.5
49.3	J1JVX2			Max.	58.5
58.5	J1B863				
43.2	J1B864				
47.4	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.925 r-squared is: 0.900
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 49.5

TPH - motor oil 95% UCL Calculation

DATA	ID				
26250	J1B856/ J1B866				
8010	J1B854				
24800	J1B855	Number of samples		Uncensored values	
54300	J1B857	Uncensored	11	Mean	25860
12400	J1B858	Censored		Lognormal mean	25993
26900	J1B859	Detection limit or PQL		Std. devn.	19460
70400	J1B860	Method detection limit		Median	21400
21400	J1B861	TOTAL	11	Min.	8010
14100	J1B863			Max.	70400
13500	J1B864				
12400	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.938 r-squared is: 0.784
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 42894

Anthracene 95% UCL Calculation

DATA	ID				
3.87	J1B856/ J1B866				
1.66	J1B854				
1.64	J1B855	Number of samples		Uncensored values	
1.33	J1B857	Uncensored	12	Mean	2.28
1.18	J1B858	Censored		Lognormal mean	2.27
5.93	J1B859	Detection limit or PQL		Std. devn.	1.46
3.63	J1B860	Method detection limit		Median	1.64
2.30	J1B861	TOTAL	12	Min.	1.18
1.40	J1JVX2			Max.	5.93
1.21	J1B863				
1.61	J1B864				
1.63	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.852 r-squared is: 0.738
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 2.97

Benzo(a)anthracene 95% UCL Calculation

DATA	ID				
32.6	J1B856/ J1B866				
3.04	J1B854				
4.51	J1B855	Number of samples		Uncensored values	
23.9	J1B857	Uncensored	12	Mean	22.6
15.3	J1B858	Censored		Lognormal mean	25.4
51.4	J1B859	Detection limit or PQL		Std. devn.	15.2
39.0	J1B860	Method detection limit		Median	25.3
28.2	J1B861	TOTAL	12	Min.	3.04
31.0	J1JVX2			Max.	51.4
26.7	J1B863				
9.00	J1B864				
6.20	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.911 r-squared is: 0.953
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 55.3

Benzo(a)pyrene 95% UCL Calculation

DATA	ID				
61.4	J1B856/ J1B866				
6.65	J1B854				
8.07	J1B855	Number of samples		Uncensored values	
51.5	J1B857	Uncensored	12	Mean	42.7
55.0	J1B858	Censored		Lognormal mean	48.4
88.0	J1B859	Detection limit or PQL		Std. devn.	26.2
63.9	J1B860	Method detection limit		Median	50.2
43.8	J1B861	TOTAL	12	Min.	6.65
58.0	J1JVX2			Max.	88.0
48.8	J1B863				
17.0	J1B864				
10.7	J1B865				

Lognormal distribution? Normal distribution?
r-squared is: 0.837 r-squared is: 0.916
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 56.3

CALCULATION SHEET

Washington Closure Hanford

Originator	T. E. Queen	Date	07/13/11
Project	100-H Field Remediation	Job No.	14655
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations		
Calc. No.	0100H-CA-V0179	Rev. No.	0
Checked	J. D. Skoglie	Date	07/13/11
		Sheet No.	30 of 49

Ecology Software (MTCAStat) Results, Area A

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
37.0	J1B856/ J1B866
5.79	J1B854
6.02	J1B855
34.4	J1B857
40.3	J1B858
60.0	J1B859
46.8	J1B860
30.6	J1B861
34.0	J1JVX2
30.9	J1B863
15.3	J1B864
11.9	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	29.4
Censored		Lognormal mean	32.0
Detection limit or PQL		Std. devn.	16.7
Method detection limit		Median	32.5
TOTAL	12	Min.	5.79
		Max.	60.0

Lognormal distribution? r-squared is: 0.866
Normal distribution? r-squared is: 0.949
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 38.1

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
35.5	J1B856/ J1B866
4.84	J1B854
5.76	J1B855
39.7	J1B857
51.9	J1B858
51.0	J1B859
37.7	J1B860
26.3	J1B861
38.0	J1JVX2
28.0	J1B863
13.9	J1B864
7.81	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	28.4
Censored		Lognormal mean	31.5
Detection limit or PQL		Std. devn.	16.9
Method detection limit		Median	31.7
TOTAL	12	Min.	4.84
		Max.	51.9

Lognormal distribution? r-squared is: 0.859
Normal distribution? r-squared is: 0.935
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 37.1

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
18.0	J1B856/ J1B866
2.56	J1B854
2.84	J1B855
15.1	J1B857
16.5	J1B858
29.9	J1B859
21.9	J1B860
15.0	J1B861
25.0	J1JVX2
15.1	J1B863
6.44	J1B864
4.19	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	14.4
Censored		Lognormal mean	15.9
Detection limit or PQL		Std. devn.	8.89
Method detection limit		Median	15.1
TOTAL	12	Min.	2.56
		Max.	29.9

Lognormal distribution? r-squared is: 0.876
Normal distribution? r-squared is: 0.946
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 19.0

Chrysene 95% UCL Calculation

DATA	ID
32.0	J1B856/ J1B866
1.96	J1B854
4.04	J1B855
18.1	J1B857
12.8	J1B858
46.3	J1B859
37.2	J1B860
26.2	J1B861
36.0	J1JVX2
28.3	J1B863
8.53	J1B864
4.12	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	21.3
Censored		Lognormal mean	25.3
Detection limit or PQL		Std. devn.	15.1
Method detection limit		Median	22.2
TOTAL	12	Min.	1.96
		Max.	46.3

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.950
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 65.2

Dibenz(a,h)anthracene 95% UCL Calculation

DATA	ID
6.43	J1B856/ J1B866
1.66	J1B854
1.07	J1B855
6.87	J1B857
7.13	J1B858
9.75	J1B859
7.10	J1B860
4.31	J1B861
5.00	J1JVX2
5.26	J1B863
1.98	J1B864
1.26	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	4.82
Censored		Lognormal mean	5.17
Detection limit or PQL		Std. devn.	2.81
Method detection limit		Median	5.13
TOTAL	12	Min.	1.07
		Max.	9.75

Lognormal distribution? r-squared is: 0.884
Normal distribution? r-squared is: 0.937
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 6.28

Fluoranthene 95% UCL Calculation

DATA	ID
107	J1B856/ J1B866
1.66	J1B854
1.64	J1B855
65.7	J1B857
40.1	J1B858
179	J1B859
157	J1B860
99.7	J1B861
34.0	J1JVX2
59.0	J1B863
25.4	J1B864
17.1	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	65.6
Censored		Lognormal mean	115
Detection limit or PQL		Std. devn.	58.7
Method detection limit		Median	49.6
TOTAL	12	Min.	1.64
		Max.	179

Lognormal distribution? r-squared is: 0.857
Normal distribution? r-squared is: 0.916
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 96.0

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
31.7	J1B856/ J1B866
2.93	J1B854
5.17	J1B855
45.9	J1B857
48.1	J1B858
56.4	J1B859
40.4	J1B860
25.5	J1B861
38.0	J1JVX2
30.5	J1B863
5.93	J1B864
5.36	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	28.0
Censored		Lognormal mean	33.7
Detection limit or PQL		Std. devn.	19.0
Method detection limit		Median	31.1
TOTAL	12	Min.	2.93
		Max.	56.4

Lognormal distribution? r-squared is: 0.833
Normal distribution? r-squared is: 0.922
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 37.8

Phenanthrene 95% UCL Calculation

DATA	ID
42.4	J1B856/ J1B866
3.16	J1B854
2.79	J1B855
15.6	J1B857
12.0	J1B858
50.7	J1B859
57.1	J1B860
32.2	J1B861
14.0	J1JVX2
11.2	J1B863
7.07	J1B864
4.89	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	21.1
Censored		Lognormal mean	23.2
Detection limit or PQL		Std. devn.	19.4
Method detection limit		Median	13.0
TOTAL	12	Min.	2.79
		Max.	57.1

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.854
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 59.8

Pyrene 95% UCL Calculation

DATA	ID
97.8	J1B856/ J1B866
8.01	J1B854
9.80	J1B855
86.0	J1B857
40.5	J1B858
184	J1B859
141	J1B860
92.5	J1B861
58.0	J1JVX2
62.2	J1B863
27.2	J1B864
16.2	J1B865

Number of samples		Uncensored values	
Uncensored	12	Mean	66.9
Censored		Lognormal mean	76.1
Detection limit or PQL		Std. devn.	54.3
Method detection limit		Median	60.1
TOTAL	12	Min.	8.01
		Max.	184

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.916
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 187

CALCULATION SHEET

Washington Closure Hanford
Originator: T. E. Queen
Project: 100-H Field Remediation
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date: 07/13/11
Job No.: 14655

Calc. No.: 0100H-CA-V0178
Checked: J. D. Skoglie

Rev. No.: 0
Date: 07/13/11
Sheet No.: 31 of 49

Ecology Software (MTCAStat) Results, Area B

Arsenic 95% UCL Calculation

DATA	ID
	J1B887/
73.7	J1B892
39.5	J1B880
43.8	J1B881
45.1	J1B882
39.1	J1B883
24.8	J1B884
12.9	J1B885
14.2	J1B886
36.5	J1B888
47.6	J1B889
97.7	J1B890
16.0	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	40.9
Censored		Lognormal mean	42.0
Detection limit or PQL		Std. devn.	24.8
Method detection limit		Median	39.3
TOTAL	12	Min.	12.9
		Max.	97.7

Lognormal distribution? r-squared is: 0.942
Normal distribution? r-squared is: 0.884
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 65.3

Barium 95% UCL Calculation

DATA	ID
	J1B887/
86.1	J1B892
73.9	J1B880
75.7	J1B881
80.2	J1B882
80.4	J1B883
86.1	J1B884
82.0	J1B885
78.3	J1B886
80.6	J1B888
76.3	J1B889
86.8	J1B890
113	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	83.3
Censored		Lognormal mean	83.3
Detection limit or PQL		Std. devn.	10.3
Method detection limit		Median	80.5
TOTAL	12	Min.	73.9
		Max.	113

Lognormal distribution? r-squared is: 0.749
Normal distribution? r-squared is: 0.691
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 88.2

Beryllium 95% UCL Calculation

DATA	ID
	J1B887/
0.335	J1B892
0.281	J1B880
0.307	J1B881
0.334	J1B882
0.324	J1B883
0.336	J1B884
0.281	J1B885
0.351	J1B886
0.316	J1B888
0.281	J1B889
0.341	J1B890
0.380	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	0.322
Censored		Lognormal mean	0.322
Detection limit or PQL		Std. devn.	0.0307
Method detection limit		Median	0.329
TOTAL	12	Min.	0.281
		Max.	0.380

Lognormal distribution? r-squared is: 0.932
Normal distribution? r-squared is: 0.937
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.339

Boron 95% UCL Calculation

DATA	ID
	J1B887/
3.13	J1B892
2.11	J1B880
2.17	J1B881
2.06	J1B882
2.01	J1B883
2.93	J1B884
3.51	J1B885
2.19	J1B886
2.52	J1B888
2.85	J1B889
2.37	J1B890
5.53	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	2.78
Censored		Lognormal mean	2.78
Detection limit or PQL		Std. devn.	0.989
Method detection limit		Median	2.45
TOTAL	12	Min.	2.01
		Max.	5.53

Lognormal distribution? r-squared is: 0.845
Normal distribution? r-squared is: 0.730
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.25

Cadmium 95% UCL Calculation

DATA	ID
	J1B887/
0.127	J1B892
0.196	J1B880
0.112	J1B881
0.0850	J1B882
0.123	J1B883
0.143	J1B884
0.158	J1B885
0.105	J1B886
0.146	J1B888
0.124	J1B889
0.104	J1B890
0.161	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	0.132
Censored		Lognormal mean	0.132
Detection limit or PQL		Std. devn.	0.0305
Method detection limit		Median	0.126
TOTAL	12	Min.	0.0850
		Max.	0.196

Lognormal distribution? r-squared is: 0.983
Normal distribution? r-squared is: 0.963
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.151

Chromium 95% UCL Calculation

DATA	ID
	J1B887/
14.2	J1B892
14.4	J1B880
13.5	J1B881
14.7	J1B882
14.5	J1B883
14.4	J1B884
13.0	J1B885
14.9	J1B886
13.2	J1B888
12.7	J1B889
13.9	J1B890
18.8	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	14.3
Censored		Lognormal mean	14.3
Detection limit or PQL		Std. devn.	1.57
Method detection limit		Median	14.3
TOTAL	12	Min.	12.7
		Max.	18.8

Lognormal distribution? r-squared is: 0.786
Normal distribution? r-squared is: 0.732
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 15.1

Cobalt 95% UCL Calculation

DATA	ID
	J1B887/
6.67	J1B892
6.04	J1B880
6.22	J1B881
6.70	J1B882
6.68	J1B883
6.87	J1B884
6.02	J1B885
7.03	J1B886
6.61	J1B888
5.94	J1B889
6.81	J1B890
7.33	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	6.58
Censored		Lognormal mean	6.58
Detection limit or PQL		Std. devn.	0.435
Method detection limit		Median	6.67
TOTAL	12	Min.	5.94
		Max.	7.33

Lognormal distribution? r-squared is: 0.940
Normal distribution? r-squared is: 0.944
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.81

Copper 95% UCL Calculation

DATA	ID
	J1B887/
11.7	J1B892
10.2	J1B880
10.7	J1B881
13.1	J1B882
12.2	J1B883
12.4	J1B884
13.0	J1B885
13.5	J1B886
11.3	J1B888
10.3	J1B889
11.8	J1B890
16.8	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	12.2
Censored		Lognormal mean	12.3
Detection limit or PQL		Std. devn.	1.80
Method detection limit		Median	12.0
TOTAL	12	Min.	10.2
		Max.	16.8

Lognormal distribution? r-squared is: 0.918
Normal distribution? r-squared is: 0.869
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.2

Lead 95% UCL Calculation

DATA	ID
	J1B887/
167	J1B892
98.3	J1B880
43.6	J1B881
24.0	J1B882
48.3	J1B883
58.3	J1B884
166	J1B885
9.41	J1B886
178	J1B888
125	J1B889
95.7	J1B890
30.1	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	86.9
Censored		Lognormal mean	97.0
Detection limit or PQL		Std. devn.	60.2
Method detection limit		Median	77.0
TOTAL	12	Min.	9.41
		Max.	178

Lognormal distribution? r-squared is: 0.932
Normal distribution? r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 207

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0179
Checked J. D. Skoglie

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Ecology Software (MTCAStat) Results, Area B

Manganese 95% UCL Calculation

DATA	ID
347	J1B887/ J1B892
303	J1B880
315	J1B881
324	J1B882
335	J1B883
347	J1B884
296	J1B885
337	J1B886
341	J1B888
299	J1B889
354	J1B890
345	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	329
Censored		Lognormal mean	329
Detection limit or PQL		Std. devn.	20.5
Method detection limit		Median	336
TOTAL	12	Min.	296
		Max.	354

Lognormal distribution? r-squared is: 0.905
Normal distribution? r-squared is: 0.912
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 340

Molybdenum 95% UCL Calculation

DATA	ID
0.225	J1B887/ J1B892
0.232	J1B880
0.269	J1B881
0.216	J1B882
0.224	J1B883
0.330	J1B884
0.230	J1B885
0.233	J1B886
0.228	J1B888
0.207	J1B889
0.220	J1B890
0.369	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	0.249
Censored		Lognormal mean	0.249
Detection limit or PQL		Std. devn.	0.0501
Method detection limit		Median	0.229
TOTAL	12	Min.	0.207
		Max.	0.369

Lognormal distribution? r-squared is: 0.746
Normal distribution? r-squared is: 0.704
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.272

Nickel 95% UCL Calculation

DATA	ID
11.1	J1B887/ J1B892
10.5	J1B880
11.1	J1B881
12.1	J1B882
11.7	J1B883
11.8	J1B884
10.6	J1B885
12.9	J1B886
11.1	J1B888
10.4	J1B889
11.0	J1B890
14.0	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	11.5
Censored		Lognormal mean	11.5
Detection limit or PQL		Std. devn.	1.06
Method detection limit		Median	11.1
TOTAL	12	Min.	10.4
		Max.	14.0

Lognormal distribution? r-squared is: 0.898
Normal distribution? r-squared is: 0.874
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.0

Vanadium 95% UCL Calculation

DATA	ID
44.7	J1B887/ J1B892
46.5	J1B880
42.8	J1B881
44.9	J1B882
44.9	J1B883
47.8	J1B884
46.8	J1B885
46.9	J1B886
44.0	J1B888
42.4	J1B889
44.5	J1B890
50.2	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	45.5
Censored		Lognormal mean	45.5
Detection limit or PQL		Std. devn.	2.21
Method detection limit		Median	44.9
TOTAL	12	Min.	42.4
		Max.	50.2

Lognormal distribution? r-squared is: 0.958
Normal distribution? r-squared is: 0.950
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 46.7

Zinc 95% UCL Calculation

DATA	ID
42.7	J1B887/ J1B892
45.8	J1B880
38.6	J1B881
37.7	J1B882
41.1	J1B883
42.4	J1B884
42.2	J1B885
39.3	J1B886
41.8	J1B888
39.2	J1B889
44.5	J1B890
47.0	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	41.9
Censored		Lognormal mean	41.9
Detection limit or PQL		Std. devn.	2.89
Method detection limit		Median	42.0
TOTAL	12	Min.	37.7
		Max.	47.0

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.969
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 43.4

TPH - motor oil 95% UCL Calculation

DATA	ID
9095	J1B887/ J1B892
57000	J1B880
8480	J1B881
6540	J1B882
5880	J1B883
10700	J1B884
8600	J1B885
4230	J1B886
13600	J1B888
13200	J1B889
5890	J1B890
26000	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	14101
Censored		Lognormal mean	13571
Detection limit or PQL		Std. devn.	14682
Method detection limit		Median	8848
TOTAL	12	Min.	4230
		Max.	57000

Lognormal distribution? r-squared is: 0.888
Normal distribution? r-squared is: 0.606
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 21073

Acenapthene 95% UCL Calculation

DATA	ID
1.54	J1B887/ J1B892
1.66	J1B880
1.71	J1B881
1.68	J1B882
1.18	J1B883
1.34	J1B884
35.0	J1B885
1.65	J1B886
1.72	J1B888
178	J1B889
1.71	J1B890
15.8	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	20.2
Censored		Lognormal mean	13.6
Detection limit or PQL		Std. devn.	50.7
Method detection limit		Median	1.69
TOTAL	12	Min.	1.18
		Max.	178

Lognormal distribution? r-squared is: 0.658
Normal distribution? r-squared is: 0.409
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 44.3

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
7.48	J1B887/ J1B892
2.97	J1B880
5.74	J1B881
3.52	J1B882
13.1	J1B883
15.9	J1B884
19.2	J1B885
1.65	J1B886
2.78	J1B888
14.8	J1B889
4.66	J1B890
14.4	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	8.85
Censored		Lognormal mean	9.42
Detection limit or PQL		Std. devn.	6.19
Method detection limit		Median	6.61
TOTAL	12	Min.	1.65
		Max.	19.2

Lognormal distribution? r-squared is: 0.937
Normal distribution? r-squared is: 0.903
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.1

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
9.62	J1B887/ J1B892
3.83	J1B880
6.17	J1B881
2.86	J1B882
19.7	J1B883
24.1	J1B884
24.5	J1B885
1.65	J1B886
4.64	J1B888
18.7	J1B889
6.51	J1B890
17.2	J1B891

Number of samples		Uncensored values	
Uncensored	12	Mean	11.8
Censored		Lognormal mean	12.9
Detection limit or PQL		Std. devn.	8.51
Method detection limit		Median	9.07
TOTAL	12	Min.	1.65
		Max.	24.5

Lognormal distribution? r-squared is: 0.942
Normal distribution? r-squared is: 0.912
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 27.4

CALCULATION SHEET

Washington Closure Hanford					
Originator	T. E. Queen	**Date**	07/13/11	**Calc. No.** 0100H-CA-V0178	**Rev. No.** 0
Project	100-H Field Remediation	**Job No.**	14655	**Checked** J. D. Skoglie	**Date** 07/13/11
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations				**Sheet No.** 33 of 49

Ecology Software (MTCAStat) Results, Area B

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID				
	J1B887/				
7.92	J1B892				
5.05	J1B880				
5.01	J1B881	Number of samples		Uncensored values	
2.27	J1B882	Uncensored	12	Mean	10.1
12.1	J1B883	Censored		Lognormal mean	11.0
17.8	J1B884	Detection limit or PQL		Std. devn.	7.27
20.4	J1B885	Method detection limit		Median	8.30
1.65	J1B886	TOTAL	12	Min.	1.65
3.0	J1B888			Max.	22.1
15.3	J1B889				
8.68	J1B890				
22.1	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.954 r-squared is: 0.932
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 22.6

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID				
	J1B887/				
8.81	J1B892				
5.33	J1B880				
4.54	J1B881	Number of samples		Uncensored values	
2.00	J1B882	Uncensored	12	Mean	9.70
15.4	J1B883	Censored		Lognormal mean	10.6
18.2	J1B884	Detection limit or PQL		Std. devn.	6.38
20.8	J1B885	Method detection limit		Median	9.25
1.65	J1B886	TOTAL	12	Min.	1.65
4.32	J1B888			Max.	20.8
13.1	J1B889				
12.6	J1B890				
9.7	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.937 r-squared is: 0.959
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 20.5

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID				
	J1B887/				
3.58	J1B892				
1.79	J1B880				
2.78	J1B881	Number of samples		Uncensored values	
1.30	J1B882	Uncensored	12	Mean	4.64
6.93	J1B883	Censored		Lognormal mean	4.81
8.72	J1B884	Detection limit or PQL		Std. devn.	3.09
9.91	J1B885	Method detection limit		Median	3.29
1.65	J1B886	TOTAL	12	Min.	1.30
1.87	J1B888			Max.	9.91
7.03	J1B889				
3.00	J1B890				
7.17	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.925 r-squared is: 0.888
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 8.24

Chrysene 95% UCL Calculation

DATA	ID				
	J1B887/				
6.81	J1B892				
1.94	J1B880				
3.33	J1B881	Number of samples		Uncensored values	
2.02	J1B882	Uncensored	12	Mean	6.75
7.17	J1B883	Censored		Lognormal mean	7.24
7.31	J1B884	Detection limit or PQL		Std. devn.	6.55
9.79	J1B885	Method detection limit		Median	5.07
1.65	J1B886	TOTAL	12	Min.	0.861
0.861	J1B888			Max.	22.0
22.0	J1B889				
1.94	J1B890				
16.2	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.955 r-squared is: 0.819
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 17.7

Dibenz(a,h)anthracene 95% UCL Calculation

DATA	ID				
	J1B887/				
1.66	J1B892				
1.06	J1B880				
1.71	J1B881	Number of samples		Uncensored values	
1.68	J1B882	Uncensored	12	Mean	2.01
2.34	J1B883	Censored		Lognormal mean	2.02
3.30	J1B884	Detection limit or PQL		Std. devn.	0.820
3.79	J1B885	Method detection limit		Median	1.71
1.65	J1B886	TOTAL	12	Min.	1.02
1.72	J1B888			Max.	3.79
1.97	J1B889				
1.02	J1B890				
2.18	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.930 r-squared is: 0.864
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.55

Fluoranthene 95% UCL Calculation

DATA	ID				
	J1B887/				
22.9	J1B892				
9.63	J1B880				
8.03	J1B881	Number of samples		Uncensored values	
3.70	J1B882	Uncensored	12	Mean	23.6
19.6	J1B883	Censored		Lognormal mean	26.9
30.1	J1B884	Detection limit or PQL		Std. devn.	24.8
89.7	J1B885	Method detection limit		Median	15.5
1.65	J1B886	TOTAL	12	Min.	1.65
6.08	J1B888			Max.	89.7
37.0	J1B889				
11.4	J1B890				
43.4	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.987 r-squared is: 0.788
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 79.4

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID				
	J1B887/				
7.16	J1B892				
2.04	J1B880				
5.13	J1B881	Number of samples		Uncensored values	
1.16	J1B882	Uncensored	12	Mean	8.63
15.1	J1B883	Censored		Lognormal mean	9.46
20.7	J1B884	Detection limit or PQL		Std. devn.	7.42
23.3	J1B885	Method detection limit		Median	6.38
1.65	J1B886	TOTAL	12	Min.	1.16
3.21	J1B888			Max.	23.3
9.68	J1B889				
8.84	J1B890				
5.60	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.976 r-squared is: 0.881
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 22.2

Phenanthrene 95% UCL Calculation

DATA	ID				
	J1B887/				
7.38	J1B892				
5.81	J1B880				
2.73	J1B881	Number of samples		Uncensored values	
2.61	J1B882	Uncensored	12	Mean	10.6
9.95	J1B883	Censored		Lognormal mean	10.7
8.48	J1B884	Detection limit or PQL		Std. devn.	12.0
19.8	J1B885	Method detection limit		Median	6.60
1.65	J1B886	TOTAL	12	Min.	1.65
3.54	J1B888			Max.	44.5
44.5	J1B889				
4.69	J1B890				
16.2	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.979 r-squared is: 0.696
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 24.2

Pyrene 95% UCL Calculation

DATA	ID				
	J1B887/				
18.8	J1B892				
18.5	J1B880				
14.4	J1B881	Number of samples		Uncensored values	
4.78	J1B882	Uncensored	12	Mean	23.3
31.0	J1B883	Censored		Lognormal mean	27.7
33.6	J1B884	Detection limit or PQL		Std. devn.	17.7
59.2	J1B885	Method detection limit		Median	18.6
1.65	J1B886	TOTAL	12	Min.	1.65
5.65	J1B888			Max.	59.2
40.7	J1B889				
10.7	J1B890				
40.5	J1B891				

Lognormal distribution? Normal distribution?
r-squared is: 0.930 r-squared is: 0.941
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 72.9

CALCULATION SHEET

Washington Closure Hanford			
Originator	T. E. Queen	Date	07/13/11
Project	100-H Field Remediation	Job No.	14655
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations		
Calc. No.	0100H-CA-V0178	Rev. No.	0
Checked	J. D. Skoglie	Date	07/13/11
		Sheet No.	34 of 49

Ecology Software (MTCAStat) Results, Area C

Arsenic 95% UCL Calculation

DATA	ID
	J1B8B0/
6.95	J1B8B5
3.92	J1B893
4.01	J1B894
3.41	J1B895
3.19	J1B896
3.65	J1B897
4.38	J1B8B1
2.50	J1B899
9.36	J1B898
18.6	J1B8B2
11.2	J1B8B3
15.6	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	7.23
Censored		Lognormal mean	7.27
Detection limit or PQL		Std. devn.	5.35
Method detection limit		Median	4.20
TOTAL	12	Min.	2.50
		Max.	18.6

Lognormal distribution? r-squared is: 0.912
Normal distribution? r-squared is: 0.815
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.7

Barium 95% UCL Calculation

DATA	ID
	J1B8B0/
84.6	J1B8B5
126	J1B893
114	J1B894
89.2	J1B895
102	J1B896
97.9	J1B897
97.3	J1B8B1
50.9	J1B899
90.0	J1B898
102	J1B8B2
72.2	J1B8B3
77.5	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	92.0
Censored		Lognormal mean	92.3
Detection limit or PQL		Std. devn.	19.7
Method detection limit		Median	93.7
TOTAL	12	Min.	50.9
		Max.	126

Lognormal distribution? r-squared is: 0.909
Normal distribution? r-squared is: 0.966
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 106

Beryllium 95% UCL Calculation

DATA	ID
	J1B8B0/
0.252	J1B8B5
0.270	J1B893
0.282	J1B894
0.299	J1B895
0.309	J1B896
0.318	J1B897
0.306	J1B8B1
0.213	J1B899
0.289	J1B898
0.292	J1B8B2
0.247	J1B8B3
0.296	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.281
Censored		Lognormal mean	0.281
Detection limit or PQL		Std. devn.	0.0305
Method detection limit		Median	0.291
TOTAL	12	Min.	0.213
		Max.	0.318

Lognormal distribution? r-squared is: 0.879
Normal distribution? r-squared is: 0.911
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 0.297

Boron 95% UCL Calculation

DATA	ID
	J1B8B0/
2.85	J1B8B5
8.00	J1B893
7.13	J1B894
2.31	J1B895
2.83	J1B896
2.72	J1B897
3.76	J1B8B1
1.69	J1B899
3.47	J1B898
5.28	J1B8B2
2.02	J1B8B3
2.31	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	3.70
Censored		Lognormal mean	3.70
Detection limit or PQL		Std. devn.	2.04
Method detection limit		Median	2.84
TOTAL	12	Min.	1.69
		Max.	8.00

Lognormal distribution? r-squared is: 0.935
Normal distribution? r-squared is: 0.827
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.07

Cadmium 95% UCL Calculation

DATA	ID
	J1B8B0/
0.124	J1B8B5
0.187	J1B893
0.159	J1B894
0.101	J1B895
0.130	J1B896
0.131	J1B897
0.148	J1B8B1
0.123	J1B899
0.130	J1B898
0.191	J1B8B2
0.111	J1B8B3
0.105	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.137
Censored		Lognormal mean	0.137
Detection limit or PQL		Std. devn.	0.0294
Method detection limit		Median	0.130
TOTAL	12	Min.	0.101
		Max.	0.191

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.908
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.153

Chromium 95% UCL Calculation

DATA	ID
	J1B8B0/
12.5	J1B8B5
11.6	J1B893
12.4	J1B894
12.6	J1B895
13.6	J1B896
12.3	J1B897
12.4	J1B8B1
12.9	J1B899
14.3	J1B898
15.8	J1B8B2
12.6	J1B8B3
13.4	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	13.0
Censored		Lognormal mean	13.0
Detection limit or PQL		Std. devn.	1.12
Method detection limit		Median	12.6
TOTAL	12	Min.	11.6
		Max.	15.8

Lognormal distribution? r-squared is: 0.868
Normal distribution? r-squared is: 0.841
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.6

Cobalt 95% UCL Calculation

DATA	ID
	J1B8B0/
6.06	J1B8B5
6.06	J1B893
6.13	J1B894
6.89	J1B895
7.65	J1B896
7.10	J1B897
7.21	J1B8B1
5.87	J1B899
6.38	J1B898
5.17	J1B8B2
5.09	J1B8B3
6.17	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	6.32
Censored		Lognormal mean	6.32
Detection limit or PQL		Std. devn.	0.782
Method detection limit		Median	6.15
TOTAL	12	Min.	5.09
		Max.	7.65

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.959
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.76

Copper 95% UCL Calculation

DATA	ID
	J1B8B0/
13.0	J1B8B5
14.4	J1B893
12.8	J1B894
13.1	J1B895
15.0	J1B896
13.3	J1B897
13.3	J1B8B1
15.5	J1B899
13.8	J1B898
11.9	J1B8B2
8.93	J1B8B3
12.2	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	13.1
Censored		Lognormal mean	13.1
Detection limit or PQL		Std. devn.	1.69
Method detection limit		Median	13.2
TOTAL	12	Min.	8.93
		Max.	15.5

Lognormal distribution? r-squared is: 0.829
Normal distribution? r-squared is: 0.890
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.9

Hexavalent chromium 95% UCL Calculation

DATA	ID
	J1B8B0/
0.16	J1B8B5
0.18	J1B893
0.16	J1B894
0.11	J1B895
0.14	J1B896
0.19	J1B897
0.11	J1B8B1
0.18	J1B899
0.16	J1B898
0.11	J1B8B2
0.10	J1B8B3
0.10	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	0.14
Censored		Lognormal mean	0.14
Detection limit or PQL		Std. devn.	0.034
Method detection limit		Median	0.15
TOTAL	12	Min.	0.10
		Max.	0.19

Lognormal distribution? r-squared is: 0.888
Normal distribution? r-squared is: 0.896
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.16

CALCULATION SHEET

Washington Closure Hanford

Originator: T. E. Queen
Project: 100-H Field Remediation
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date: 07/13/11
Job No.: 14655

Calc. No.: 0100H-CA-V0178
Checked: J. D. Skoglie

Rev. No.: 0
Date: 07/13/11
Sheet No.: 35 of 49

Ecology Software (MTCAStat) Results, Area C

DATA	ID	Lead 95% UCL Calculation			
	J1B8B0/				
16.9	J1B8B5				
21.2	J1B893				
18.8	J1B894	Number of samples		Uncensored values	
4.99	J1B895	Uncensored	12	Mean	33.5
4.78	J1B896	Censored		Lognormal mean	32.1
5.69	J1B897	Detection limit or PQL		Std. devn.	53.5
13.1	J1B8B1	Method detection limit		Median	17.9
5.07	J1B899	TOTAL	12	Min.	4.78
37.9	J1B898			Max.	198
198	J1B8B2				
32.0	J1B8B3				
43.6	J1B8B4				

Lognormal distribution? r-squared is: 0.914
Normal distribution? r-squared is: 0.520
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 93.3

DATA	ID	Manganese 95% UCL Calculation			
	J1B8B0/				
278	J1B8B5				
270	J1B893				
270	J1B894	Number of samples		Uncensored values	
290	J1B895	Uncensored	12	Mean	283
320	J1B896	Censored		Lognormal mean	283
314	J1B897	Detection limit or PQL		Std. devn.	29.6
326	J1B8B1	Method detection limit		Median	283
235	J1B899	TOTAL	12	Min.	235
305	J1B898			Max.	326
250	J1B8B2				
249	J1B8B3				
287	J1B8B4				

Lognormal distribution? r-squared is: 0.971
Normal distribution? r-squared is: 0.974
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 299

DATA	ID	Molybdenum 95% UCL Calculation			
	J1B8B0/				
0.294	J1B8B5				
0.434	J1B893				
0.367	J1B894	Number of samples		Uncensored values	
0.298	J1B895	Uncensored	12	Mean	0.319
0.325	J1B896	Censored		Lognormal mean	0.320
0.301	J1B897	Detection limit or PQL		Std. devn.	0.0531
0.345	J1B8B1	Method detection limit		Median	0.313
0.354	J1B899	TOTAL	12	Min.	0.237
0.331	J1B898			Max.	0.434
0.299	J1B8B2				
0.249	J1B8B3				
0.237	J1B8B4				

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.948
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.350

DATA	ID	Nickel 95% UCL Calculation			
	J1B8B0/				
9.98	J1B8B5				
10.0	J1B893				
10.8	J1B894	Number of samples		Uncensored values	
12.4	J1B895	Uncensored	12	Mean	11.7
14.3	J1B896	Censored		Lognormal mean	11.7
12.6	J1B897	Detection limit or PQL		Std. devn.	2.32
11.5	J1B8B1	Method detection limit		Median	11.1
17.6	J1B899	TOTAL	12	Min.	9.53
11.2	J1B898			Max.	17.6
9.53	J1B8B2				
9.64	J1B8B3				
11.0	J1B8B4				

Lognormal distribution? r-squared is: 0.887
Normal distribution? r-squared is: 0.826
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.8

DATA	ID	Vanadium 95% UCL Calculation			
	J1B8B0/				
46.4	J1B8B5				
46.4	J1B893				
40.6	J1B894	Number of samples		Uncensored values	
41.3	J1B895	Uncensored	12	Mean	43.9
49.6	J1B896	Censored		Lognormal mean	43.9
43.3	J1B897	Detection limit or PQL		Std. devn.	4.36
47.7	J1B8B1	Method detection limit		Median	43.8
44.3	J1B899	TOTAL	12	Min.	36.4
50.1	J1B898			Max.	50.1
38.1	J1B8B2				
36.4	J1B8B3				
42.1	J1B8B4				

Lognormal distribution? r-squared is: 0.976
Normal distribution? r-squared is: 0.981
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 46.3

DATA	ID	Zinc 95% UCL Calculation			
	J1B8B0/				
39.35	J1B8B5				
44.2	J1B893				
43.4	J1B894	Number of samples		Uncensored values	
40.1	J1B895	Uncensored	12	Mean	42.0
44.9	J1B896	Censored		Lognormal mean	42.0
44.6	J1B897	Detection limit or PQL		Std. devn.	3.39
47.3	J1B8B1	Method detection limit		Median	42.7
39.4	J1B899	TOTAL	12	Min.	35.6
41.9	J1B898			Max.	47.3
44.8	J1B8B2				
35.6	J1B8B3				
38.8	J1B8B4				

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.951
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 43.9

DATA	ID	TPH - motor oil 95% UCL Calculation			
	J1B8B0/				
10365	J1B8B5				
36400	J1B893				
29500	J1B894	Number of samples		Uncensored values	
5100	J1B895	Uncensored	12	Mean	13834
5050	J1B896	Censored		Lognormal mean	14233
13400	J1B897	Detection limit or PQL		Std. devn.	10455
4060	J1B8B1	Method detection limit		Median	11883
5000	J1B899	TOTAL	12	Min.	4060
17200	J1B898			Max.	36400
18500	J1B8B2				
5430	J1B8B3				
16000	J1B8B4				

Lognormal distribution? r-squared is: 0.922
Normal distribution? r-squared is: 0.858
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 25289

DATA	ID	Benzo(a)anthracene 95% UCL Calculation			
	J1B8B0/				
44.3	J1B8B5				
13.4	J1B893				
3.14	J1B894	Number of samples		Uncensored values	
1.67	J1B895	Uncensored	12	Mean	21.4
1.69	J1B896	Censored		Lognormal mean	23.6
1.68	J1B897	Detection limit or PQL		Std. devn.	36.5
1.80	J1B8B1	Method detection limit		Median	7.52
1.58	J1B899	TOTAL	12	Min.	1.58
129	J1B898			Max.	129
31.1	J1B8B2				
15.0	J1B8B3				
11.9	J1B8B4				

Lognormal distribution? r-squared is: 0.880
Normal distribution? r-squared is: 0.584
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 38.7

DATA	ID	Benzo(a)pyrene 95% UCL Calculation			
	J1B8B0/				
27.5	J1B8B5				
11.1	J1B893				
2.48	J1B894	Number of samples		Uncensored values	
1.67	J1B895	Uncensored	12	Mean	25.2
1.69	J1B896	Censored		Lognormal mean	25.5
1.68	J1B897	Detection limit or PQL		Std. devn.	50.3
1.80	J1B8B1	Method detection limit		Median	6.79
1.58	J1B899	TOTAL	12	Min.	1.58
179	J1B898			Max.	179
46.6	J1B8B2				
14.3	J1B8B3				
12.6	J1B8B4				

Lognormal distribution? r-squared is: 0.867
Normal distribution? r-squared is: 0.502
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 49.1

CALCULATION SHEET

Washington Closure Hanford			
Originator: T. E. Queen	Date: 07/13/11	Calc. No.: 0100H-CA-V0178	Rev. No.: 0
Project: 100-H Field Remediation	Job No.: 14655	Checked: J. D. Skoglie	Date: 07/13/11
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 36 of 49

Ecology Software (MTCAStat) Results, Area C

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
45.1	J1B8B0/ J1B8B5
4.24	J1B893
3.47	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
190	J1B898
47.3	J1B8B2
10.7	J1B8B3
11.7	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	26.7
Censored		Lognormal mean	25.9
Detection limit or PQL		Std. devn.	54.0
Method detection limit		Median	3.86
TOTAL	12	Min.	1.58
		Max.	190

Lognormal distribution? r-squared is: 0.858
Normal distribution? r-squared is: 0.509
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 52.4

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
14.9	J1B8B0/ J1B8B5
90.1	J1B893
1.82	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
116	J1B898
34.3	J1B8B2
10.6	J1B8B3
8.93	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	23.8
Censored		Lognormal mean	26.8
Detection limit or PQL		Std. devn.	38.6
Method detection limit		Median	5.38
TOTAL	12	Min.	1.58
		Max.	116

Lognormal distribution? r-squared is: 0.844
Normal distribution? r-squared is: 0.640
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 42.1

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
14.0	J1B8B0/ J1B8B5
6.89	J1B893
1.65	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
86.3	J1B898
17.6	J1B8B2
5.55	J1B8B3
5.35	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	12.1
Censored		Lognormal mean	10.5
Detection limit or PQL		Std. devn.	23.9
Method detection limit		Median	3.57
TOTAL	12	Min.	1.58
		Max.	86.3

Lognormal distribution? r-squared is: 0.825
Normal distribution? r-squared is: 0.467
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 23.5

Chrysene 95% UCL Calculation

DATA	ID
54.1	J1B8B0/ J1B8B5
19.4	J1B893
22.7	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
99.9	J1B898
30.3	J1B8B2
8.18	J1B8B3
8.66	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	21.0
Censored		Lognormal mean	25.9
Detection limit or PQL		Std. devn.	29.5
Method detection limit		Median	8.42
TOTAL	12	Min.	1.58
		Max.	99.9

Lognormal distribution? r-squared is: 0.892
Normal distribution? r-squared is: 0.706
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 35.0

Fluoranthene 95% UCL Calculation

DATA	ID
135	J1B8B0/ J1B8B5
11.0	J1B893
14.7	J1B894
1.67	J1B895
1.69	J1B896
2.19	J1B897
11.0	J1B8B1
1.58	J1B899
149	J1B898
100	J1B8B2
29.4	J1B8B3
24.5	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	40.1
Censored		Lognormal mean	57.9
Detection limit or PQL		Std. devn.	54.8
Method detection limit		Median	12.9
TOTAL	12	Min.	1.58
		Max.	149

Lognormal distribution? r-squared is: 0.919
Normal distribution? r-squared is: 0.726
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 561

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
11.9	J1B8B0/ J1B8B5
9.19	J1B893
7.44	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
121	J1B898
35.3	J1B8B2
14.7	J1B8B3
10.9	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	18.2
Censored		Lognormal mean	18.1
Detection limit or PQL		Std. devn.	33.7
Method detection limit		Median	8.32
TOTAL	12	Min.	1.58
		Max.	121

Lognormal distribution? r-squared is: 0.882
Normal distribution? r-squared is: 0.512
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 34.3

Phenanthrene 95% UCL Calculation

DATA	ID
27.4	J1B8B0/ J1B8B5
26.5	J1B893
9.26	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
19.3	J1B898
33.3	J1B8B2
9.70	J1B8B3
8.97	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	11.9
Censored		Lognormal mean	14.2
Detection limit or PQL		Std. devn.	11.7
Method detection limit		Median	9.12
TOTAL	12	Min.	1.58
		Max.	33.3

Lognormal distribution? r-squared is: 0.853
Normal distribution? r-squared is: 0.844
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 17.5

Pyrene 95% UCL Calculation

DATA	ID
93.5	J1B8B0/ J1B8B5
35.5	J1B893
6.12	J1B894
1.67	J1B895
1.69	J1B896
1.68	J1B897
1.80	J1B8B1
1.58	J1B899
262	J1B898
104	J1B8B2
33.3	J1B8B3
30.5	J1B8B4

Number of samples		Uncensored values	
Uncensored	12	Mean	47.8
Censored		Lognormal mean	77.2
Detection limit or PQL		Std. devn.	76.4
Method detection limit		Median	18.3
TOTAL	12	Min.	1.58
		Max.	262

Lognormal distribution? r-squared is: 0.872
Normal distribution? r-squared is: 0.653
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 84.0

CALCULATION SHEET

Washington Closure Hanford			
Originator: T. E. Queen	Date: 07/13/11	Calc. No.: 0100H-CA-V0178	Rev. No.: 0
Project: 100-H Field Remediation	Job No.: 14655	Checked: J. D. Skoglie	Date: 07/13/11
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 37 of 49

Ecology Software (MTCAStat) Results, Area D

Arsenic 95% UCL Calculation

DATA	ID
3.30	J1B8C0/ J1B8C8
3.46	J1B8B6
3.14	J1B8B7
3.31	J1B8B8
2.75	J1B8B9
2.96	J1B8C1
2.78	J1B8C2
2.26	J1B8C3
3.57	J1B8C4
6.68	J1B8C5
10.7	J1B8C6
3.80	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	4.06
Censored		Lognormal mean	4.01
Detection limit or PQL		Std. devn.	2.36
Method detection limit		Median	3.31
TOTAL	12	Min.	2.26
		Max.	10.7

Lognormal distribution? r-squared is: 0.775
Normal distribution? r-squared is: 0.622
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 5.18

Barium 95% UCL Calculation

DATA	ID
99.8	J1B8C0/ J1B8C8
98.7	J1B8B6
105	J1B8B7
91.4	J1B8B8
71.4	J1B8B9
76.5	J1B8C1
85.7	J1B8C2
58.1	J1B8C3
85.1	J1B8C4
107	J1B8C5
97.2	J1B8C6
61.4	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	86.4
Censored		Lognormal mean	86.7
Detection limit or PQL		Std. devn.	16.5
Method detection limit		Median	88.6
TOTAL	12	Min.	58.1
		Max.	107

Lognormal distribution? r-squared is: 0.920
Normal distribution? r-squared is: 0.947
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 97.1

Beryllium 95% UCL Calculation

DATA	ID
0.391	J1B8C0/ J1B8C8
0.338	J1B8B6
0.240	J1B8B7
0.301	J1B8B8
0.263	J1B8B9
0.211	J1B8C1
0.279	J1B8C2
0.205	J1B8C3
0.328	J1B8C4
0.272	J1B8C5
0.290	J1B8C6
0.245	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.280
Censored		Lognormal mean	0.281
Detection limit or PQL		Std. devn.	0.0539
Method detection limit		Median	0.276
TOTAL	12	Min.	0.205
		Max.	0.391

Lognormal distribution? r-squared is: 0.987
Normal distribution? r-squared is: 0.971
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.312

Boron 95% UCL Calculation

DATA	ID
2.23	J1B8C0/ J1B8C8
3.53	J1B8B6
7.11	J1B8B7
3.26	J1B8B8
2.21	J1B8B9
3.42	J1B8C1
1.99	J1B8C2
1.61	J1B8C3
1.91	J1B8C4
6.91	J1B8C5
4.12	J1B8C6
1.91	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	3.35
Censored		Lognormal mean	3.36
Detection limit or PQL		Std. devn.	1.88
Method detection limit		Median	2.75
TOTAL	12	Min.	1.61
		Max.	7.11

Lognormal distribution? r-squared is: 0.908
Normal distribution? r-squared is: 0.806
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.63

Cadmium 95% UCL Calculation

DATA	ID
0.134	J1B8C0/ J1B8C8
0.129	J1B8B6
0.191	J1B8B7
0.108	J1B8B8
0.153	J1B8B9
0.144	J1B8C1
0.129	J1B8C2
0.123	J1B8C3
0.146	J1B8C4
0.227	J1B8C5
0.140	J1B8C6
0.119	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.145
Censored		Lognormal mean	0.145
Detection limit or PQL		Std. devn.	0.0332
Method detection limit		Median	0.137
TOTAL	12	Min.	0.108
		Max.	0.227

Lognormal distribution? r-squared is: 0.891
Normal distribution? r-squared is: 0.820
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.161

Chromium 95% UCL Calculation

DATA	ID
15.1	J1B8C0/ J1B8C8
14.5	J1B8B6
11.3	J1B8B7
13.3	J1B8B8
14.6	J1B8B9
12.9	J1B8C1
12.2	J1B8C2
12.1	J1B8C3
13.4	J1B8C4
12.5	J1B8C5
16.4	J1B8C6
14.7	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	13.6
Censored		Lognormal mean	13.6
Detection limit or PQL		Std. devn.	1.49
Method detection limit		Median	13.4
TOTAL	12	Min.	11.3
		Max.	16.4

Lognormal distribution? r-squared is: 0.976
Normal distribution? r-squared is: 0.970
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.4

Cobalt 95% UCL Calculation

DATA	ID
7.56	J1B8C0/ J1B8C8
6.81	J1B8B6
5.14	J1B8B7
6.26	J1B8B8
7.05	J1B8B9
5.82	J1B8C1
7.10	J1B8C2
6.34	J1B8C3
6.59	J1B8C4
6.10	J1B8C5
6.13	J1B8C6
6.26	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	6.43
Censored		Lognormal mean	6.43
Detection limit or PQL		Std. devn.	0.645
Method detection limit		Median	6.30
TOTAL	12	Min.	5.14
		Max.	7.56

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.966
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.79

Copper 95% UCL Calculation

DATA	ID
13.4	J1B8C0/ J1B8C8
12.1	J1B8B6
12.6	J1B8B7
12.0	J1B8B8
13.6	J1B8B9
13.7	J1B8C1
12.3	J1B8C2
11.7	J1B8C3
10.9	J1B8C4
17.4	J1B8C5
13.8	J1B8C6
12.5	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	13.0
Censored		Lognormal mean	13.0
Detection limit or PQL		Std. devn.	1.65
Method detection limit		Median	12.6
TOTAL	12	Min.	10.9
		Max.	17.4

Lognormal distribution? r-squared is: 0.866
Normal distribution? r-squared is: 0.812
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.8

Hexavalent chromium 95% UCL Calculation

DATA	ID
0.11	J1B8C0/ J1B8C8
0.16	J1B8B6
0.11	J1B8B7
0.10	J1B8B8
0.11	J1B8B9
0.070	J1B8C1
0.14	J1B8C2
0.16	J1B8C3
0.18	J1B8C4
0.090	J1B8C5
0.12	J1B8C6
0.17	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.13
Censored		Lognormal mean	0.13
Detection limit or PQL		Std. devn.	0.035
Method detection limit		Median	0.11
TOTAL	12	Min.	0.070
		Max.	0.18

Lognormal distribution? r-squared is: 0.946
Normal distribution? r-squared is: 0.941
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.15

CALCULATION SHEET

Washington Closure Hanford					
Originator	T. E. Queen	**Date**	07/13/11	**Calc. No.**	0100H-CA-V0178
Project	100-H Field Remediation	**Job No.**	14655	**Checked**	J. D. Skoglie
Subject	128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			**Rev. No.**	0
				Date	07/13/11
				Sheet No.	38 of 49

Ecology Software (MTCAStat) Results, Area D

Lead 95% UCL Calculation

DATA	ID J1B8C0/
5.06	J1B8C8
3.75	J1B8B6
19.9	J1B8B7
4.08	J1B8B8
6.90	J1B8B9
19.6	J1B8C1
4.90	J1B8C2
4.67	J1B8C3
5.13	J1B8C4
74.9	J1B8C5
44.4	J1B8C6
14.4	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	17.3
Censored		Lognormal mean	16.9
Detection limit or PQL		Std. devn.	21.6
Method detection limit		Median	6.02
TOTAL	12	Min.	3.75
		Max.	74.9

Lognormal distribution? r-squared is: 0.866
Normal distribution? r-squared is: 0.668
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 27.6

Manganese 95% UCL Calculation

DATA	ID J1B8C0/
372	J1B8C8
326	J1B8B6
222	J1B8B7
284	J1B8B8
310	J1B8B9
267	J1B8C1
333	J1B8C2
282	J1B8C3
343	J1B8C4
275	J1B8C5
277	J1B8C6
284	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	298
Censored		Lognormal mean	298
Detection limit or PQL		Std. devn.	40.4
Method detection limit		Median	284
TOTAL	12	Min.	222
		Max.	372

Lognormal distribution? r-squared is: 0.942
Normal distribution? r-squared is: 0.949
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 321

Mercury 95% UCL Calculation

DATA	ID J1B8C0/
0.015	J1B8C8
0.014	J1B8B6
1.07	J1B8B7
0.013	J1B8B8
0.020	J1B8B9
0.035	J1B8C1
0.012	J1B8C2
0.010	J1B8C3
0.015	J1B8C4
0.048	J1B8C5
0.0080	J1B8C6
0.015	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.11
Censored		Lognormal mean	0.054
Detection limit or PQL		Std. devn.	0.30
Method detection limit		Median	0.015
TOTAL	12	Min.	0.0080
		Max.	1.07

Lognormal distribution? r-squared is: 0.634
Normal distribution? r-squared is: NA
Recommendations:
Reject BOTH lognormal and normal distributions.
Unable to analyze probability plot for normal case.
UCL (based on Z-statistic) is 0.25

Molybdenum 95% UCL Calculation

DATA	ID J1B8C0/
0.327	J1B8C8
0.288	J1B8B6
0.315	J1B8B7
0.242	J1B8B8
0.524	J1B8B9
0.389	J1B8C1
0.327	J1B8C2
0.427	J1B8C3
0.329	J1B8C4
0.481	J1B8C5
0.459	J1B8C6
0.302	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	0.368
Censored		Lognormal mean	0.368
Detection limit or PQL		Std. devn.	0.0872
Method detection limit		Median	0.328
TOTAL	12	Min.	0.242
		Max.	0.524

Lognormal distribution? r-squared is: 0.957
Normal distribution? r-squared is: 0.938
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 0.420

Nickel 95% UCL Calculation

DATA	ID J1B8C0/
13.2	J1B8C8
11.8	J1B8B6
9.9	J1B8B7
11.2	J1B8B8
11.5	J1B8B9
11.1	J1B8C1
10.0	J1B8C2
10.5	J1B8C3
11.2	J1B8C4
10.4	J1B8C5
12.3	J1B8C6
10.5	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	11.1
Censored		Lognormal mean	11.1
Detection limit or PQL		Std. devn.	0.96
Method detection limit		Median	11.2
TOTAL	12	Min.	9.91
		Max.	13.2

Lognormal distribution? r-squared is: 0.960
Normal distribution? r-squared is: 0.946
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 11.6

Vanadium 95% UCL Calculation

DATA	ID J1B8C0/
48.4	J1B8C8
41.7	J1B8B6
39.4	J1B8B7
39.8	J1B8B8
58.4	J1B8B9
48.4	J1B8C1
52.5	J1B8C2
58.2	J1B8C3
43.0	J1B8C4
49.4	J1B8C5
45.7	J1B8C6
50.2	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	47.9
Censored		Lognormal mean	48.0
Detection limit or PQL		Std. devn.	6.40
Method detection limit		Median	48.4
TOTAL	12	Min.	39.4
		Max.	58.4

Lognormal distribution? r-squared is: 0.961
Normal distribution? r-squared is: 0.953
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 51.5

Zinc 95% UCL Calculation

DATA	ID J1B8C0/
43.2	J1B8C8
42.6	J1B8B6
38.7	J1B8B7
37.0	J1B8B8
40.7	J1B8B9
36.9	J1B8C1
39.5	J1B8C2
36.3	J1B8C3
39.9	J1B8C4
42.8	J1B8C5
38.5	J1B8C6
36.5	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	39.4
Censored		Lognormal mean	39.4
Detection limit or PQL		Std. devn.	2.51
Method detection limit		Median	39.1
TOTAL	12	Min.	36.3
		Max.	43.2

Lognormal distribution? r-squared is: 0.938
Normal distribution? r-squared is: 0.934
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 40.7

TPH - motor oil 95% UCL Calculation

DATA	ID J1B8C0/
5163	J1B8C8
4950	J1B8B6
29300	J1B8B7
6970	J1B8B8
4970	J1B8B9
3590	J1B8C1
4800	J1B8C2
6810	J1B8C3
5100	J1B8C4
25100	J1B8C5
66700	J1B8C6
6450	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	14159
Censored		Lognormal mean	13133
Detection limit or PQL		Std. devn.	18601
Method detection limit		Median	5806
TOTAL	12	Min.	3590
		Max.	66700

Lognormal distribution? r-squared is: 0.766
Normal distribution? r-squared is: 0.584
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 22992

Acenapthene 95% UCL Calculation

DATA	ID J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
19.4	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
2.31	J1B8C1
9.82	J1B8C2
1.68	J1B8C3
1.72	J1B8C4
15.6	J1B8C5
34.0	J1B8C6
2.87	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	7.85
Censored		Lognormal mean	7.72
Detection limit or PQL		Std. devn.	10.3
Method detection limit		Median	2.05
TOTAL	12	Min.	1.64
		Max.	34.0

Lognormal distribution? r-squared is: 0.780
Normal distribution? r-squared is: 0.681
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 12.7

CALCULATION SHEET

Washington Closure Hanford			
Originator T. E. Queen	**Date** 07/13/11	**Calc. No.** 0100H-CA-V0178	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** J. D. Skoglie	**Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 39 of 49

Ecology Software (MTCAStat) Results, Area D

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
22.6	J1B8B7
1.84	J1B8B8
1.79	J1B8B9
2.59	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
6.21	J1B8C4
5.09	J1B8C5
19.1	J1B8C6
2.65	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	5.72
Censored		Lognormal mean	5.37
Detection limit or PQL		Std. devn.	7.26
Method detection limit		Median	2.22
TOTAL	12	Min.	1.64
		Max.	22.6

Lognormal distribution? r-squared is: 0.779
Normal distribution? r-squared is: 0.617
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 9.16

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
11.0	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
3.52	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
7.91	J1B8C4
8.22	J1B8C5
24.3	J1B8C6
1.59	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	5.56
Censored		Lognormal mean	5.40
Detection limit or PQL		Std. devn.	6.76
Method detection limit		Median	1.75
TOTAL	12	Min.	1.59
		Max.	24.3

Lognormal distribution? r-squared is: 0.786
Normal distribution? r-squared is: 0.647
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 8.77

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
14.3	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
5.39	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
4.75	J1B8C4
9.58	J1B8C5
27.9	J1B8C6
1.59	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	6.14
Censored		Lognormal mean	5.91
Detection limit or PQL		Std. devn.	7.94
Method detection limit		Median	1.75
TOTAL	12	Min.	1.59
		Max.	27.9

Lognormal distribution? r-squared is: 0.793
Normal distribution? r-squared is: 0.643
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 9.91

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
7.96	J1B8B7
1.66	J1B8B8
1.06	J1B8B9
2.97	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
4.56	J1B8C4
6.44	J1B8C5
15.9	J1B8C6
1.28	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	4.05
Censored		Lognormal mean	3.96
Detection limit or PQL		Std. devn.	4.35
Method detection limit		Median	1.70
TOTAL	12	Min.	1.06
		Max.	15.9

Lognormal distribution? r-squared is: 0.874
Normal distribution? r-squared is: 0.685
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 6.11

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
4.7	J1B8B7
1.66	J1B8B8
1.79	J1B8B9
1.78	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
2.75	J1B8C4
3.34	J1B8C5
9.49	J1B8C6
0.93	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	2.76
Censored		Lognormal mean	2.70
Detection limit or PQL		Std. devn.	2.35
Method detection limit		Median	1.745
TOTAL	12	Min.	0.93
		Max.	9.49

Lognormal distribution? r-squared is: 0.828
Normal distribution? r-squared is: 0.627
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.88

Fluoranthene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
42.4	J1B8B7
2.49	J1B8B8
5.19	J1B8B9
28.2	J1B8C1
2.20	J1B8C2
27.3	J1B8C3
16.0	J1B8C4
27.6	J1B8C5
57.3	J1B8C6
3.35	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	17.9
Censored		Lognormal mean	22.4
Detection limit or PQL		Std. devn.	18.7
Method detection limit		Median	10.6
TOTAL	12	Min.	1.64
		Max.	57.3

Lognormal distribution? r-squared is: 0.895
Normal distribution? r-squared is: 0.847
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 26.8

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
1.69	J1B8B7
4.76	J1B8B8
2.33	J1B8B9
2.00	J1B8C1
2.01	J1B8C2
1.68	J1B8C3
4.68	J1B8C4
4.19	J1B8C5
13.7	J1B8C6
1.67	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	3.50
Censored		Lognormal mean	3.37
Detection limit or PQL		Std. devn.	3.44
Method detection limit		Median	2.01
TOTAL	12	Min.	1.64
		Max.	13.7

Lognormal distribution? r-squared is: 0.770
Normal distribution? r-squared is: 0.571
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 5.14

Phenanthrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
25.7	J1B8B7
2.15	J1B8B8
0.97	J1B8B9
5.45	J1B8C1
1.02	J1B8C2
1.68	J1B8C3
5.68	J1B8C4
9.15	J1B8C5
19.5	J1B8C6
1.12	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	6.31
Censored		Lognormal mean	6.37
Detection limit or PQL		Std. devn.	8.11
Method detection limit		Median	1.93
TOTAL	12	Min.	0.97
		Max.	25.7

Lognormal distribution? r-squared is: 0.899
Normal distribution? r-squared is: 0.700
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 10.2

Pyrene 95% UCL Calculation

DATA	ID
	J1B8C0/
1.71	J1B8C8
1.64	J1B8B6
5.66	J1B8B7
1.69	J1B8B8
1.09	J1B8B9
6.77	J1B8C1
1.69	J1B8C2
1.68	J1B8C3
12.6	J1B8C4
16.3	J1B8C5
58.6	J1B8C6
2.95	J1B8C7

Number of samples		Uncensored values	
Uncensored	12	Mean	9.36
Censored		Lognormal mean	8.56
Detection limit or PQL		Std. devn.	16.3
Method detection limit		Median	2.33
TOTAL	12	Min.	1.09
		Max.	58.6

Lognormal distribution? r-squared is: 0.865
Normal distribution? r-squared is: 0.528
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 17.1

CALCULATION SHEET

Washington Closure Hanford			
Originator: T. E. Queen	Date: 07/13/11	Calc. No.: 0100H-CA-V0178	Rev. No.: 0
Project: 100-H Field Remediation	Job No.: 14655	Checked: J. D. Skoglie	Date: 07/13/11
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 40 of 49

Ecology Software (MTCAStat) Results, Area E

Arsenic 95% UCL Calculation

DATA	ID
6.0	J1JCT4/ J1JCV1
3.7	J1JCR9
2.2	J1JCT0
2.5	J1JCT1
1.7	J1JCT2
4.1	J1JCT3
3.1	J1JCT5
2.9	J1JCT6
2.7	J1JCT7
4.5	J1JCT8
2.5	J1JCT9
1.7	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	3.1
Censored		Lognormal mean	3.1
Detection limit or PQL		Std. devn.	1.2
Method detection limit		Median	2.8
TOTAL	12	Min.	1.7
		Max.	6.0

Lognormal distribution? r-squared is: 0.975 — Normal distribution? r-squared is: 0.915

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.0

Barium 95% UCL Calculation

DATA	ID
88.0	J1JCT4/ J1JCV1
60.7	J1JCR9
51.4	J1JCT0
71.2	J1JCT1
49.7	J1JCT2
52.6	J1JCT3
52.6	J1JCT5
70.7	J1JCT6
49.8	J1JCT7
74.0	J1JCT8
41.6	J1JCT9
43.6	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	58.8
Censored		Lognormal mean	58.9
Detection limit or PQL		Std. devn.	14.2
Method detection limit		Median	52.6
TOTAL	12	Min.	41.6
		Max.	88.0

Lognormal distribution? r-squared is: 0.943 — Normal distribution? r-squared is: 0.911

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 67.1

Boron 95% UCL Calculation

DATA	ID
2.8	J1JCT4/ J1JCV1
1.1	J1JCR9
1.0	J1JCT0
1.3	J1JCT1
0.46	J1JCT2
0.43	J1JCT3
0.47	J1JCT5
1.3	J1JCT6
0.47	J1JCT7
1.6	J1JCT8
0.47	J1JCT9
0.50	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	0.98
Censored		Lognormal mean	0.99
Detection limit or PQL		Std. devn.	0.70
Method detection limit		Median	0.74
TOTAL	12	Min.	0.43
		Max.	2.8

Lognormal distribution? r-squared is: 0.865 — Normal distribution? r-squared is: 0.784

Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.3

Cadmium 95% UCL Calculation

DATA	ID
0.11	J1JCT4/ J1JCV1
0.063	J1JCR9
0.064	J1JCT0
0.086	J1JCT1
0.041	J1JCT2
0.041	J1JCT3
0.048	J1JCT5
0.076	J1JCT6
0.020	J1JCT7
0.083	J1JCT8
0.042	J1JCT9
0.045	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	0.060
Censored		Lognormal mean	0.061
Detection limit or PQL		Std. devn.	0.025
Method detection limit		Median	0.056
TOTAL	12	Min.	0.020
		Max.	0.11

Lognormal distribution? r-squared is: 0.930 — Normal distribution? r-squared is: 0.950

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.082

Chromium 95% UCL Calculation

DATA	ID
13.0	J1JCT4/ J1JCV1
11.0	J1JCR9
16.5	J1JCT0
10.7	J1JCT1
9.7	J1JCT2
9.4	J1JCT3
10.8	J1JCT5
13.3	J1JCT6
11.0	J1JCT7
11.8	J1JCT8
12.8	J1JCT9
9.6	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	11.6
Censored		Lognormal mean	11.6
Detection limit or PQL		Std. devn.	2.0
Method detection limit		Median	11.0
TOTAL	12	Min.	9.4
		Max.	16.5

Lognormal distribution? r-squared is: 0.925 — Normal distribution? r-squared is: 0.881

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 12.7

Cobalt 95% UCL Calculation

DATA	ID
6.9	J1JCT4/ J1JCV1
6.9	J1JCR9
5.9	J1JCT0
7.6	J1JCT1
5.8	J1JCT2
5.1	J1JCT3
5.2	J1JCT5
6.3	J1JCT6
5.7	J1JCT7
5.8	J1JCT8
5.6	J1JCT9
6.6	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	6.1
Censored		Lognormal mean	6.1
Detection limit or PQL		Std. devn.	0.75
Method detection limit		Median	5.9
TOTAL	12	Min.	5.1
		Max.	7.6

Lognormal distribution? r-squared is: 0.965 — Normal distribution? r-squared is: 0.952

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.5

Copper 95% UCL Calculation

DATA	ID
13.2	J1JCT4/ J1JCV1
15.9	J1JCR9
15.0	J1JCT0
17.4	J1JCT1
13.6	J1JCT2
21.9	J1JCT3
14.2	J1JCT5
13.1	J1JCT6
14.5	J1JCT7
10.7	J1JCT8
16.1	J1JCT9
15.9	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	15.1
Censored		Lognormal mean	15.1
Detection limit or PQL		Std. devn.	2.77
Method detection limit		Median	14.8
TOTAL	12	Min.	10.7
		Max.	21.9

Lognormal distribution? r-squared is: 0.933 — Normal distribution? r-squared is: 0.891

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 16.7

Lead 95% UCL Calculation

DATA	ID
5.6	J1JCT4/ J1JCV1
3.0	J1JCR9
4.9	J1JCT0
4.2	J1JCT1
2.6	J1JCT2
6.5	J1JCT3
8.1	J1JCT5
4.9	J1JCT6
4.5	J1JCT7
11.6	J1JCT8
3.2	J1JCT9
2.8	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	5.2
Censored		Lognormal mean	5.2
Detection limit or PQL		Std. devn.	2.6
Method detection limit		Median	4.7
TOTAL	12	Min.	2.6
		Max.	11.6

Lognormal distribution? r-squared is: 0.958 — Normal distribution? r-squared is: 0.847

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.9

Manganese 95% UCL Calculation

DATA	ID
317	J1JCT4/ J1JCV1
284	J1JCR9
230	J1JCT0
331	J1JCT1
225	J1JCT2
203	J1JCT3
197	J1JCT5
266	J1JCT6
201	J1JCT7
251	J1JCT8
212	J1JCT9
236	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	246
Censored		Lognormal mean	246
Detection limit or PQL		Std. devn.	45.1
Method detection limit		Median	233
TOTAL	12	Min.	197
		Max.	331

Lognormal distribution? r-squared is: 0.943 — Normal distribution? r-squared is: 0.918

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 271

CALCULATION SHEET

Washington Closure Hanford
Originator T. E. Queen
Project 100-H Field Remediation
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 07/13/11
Job No. 14655

Calc. No. 0100H-CA-V0178
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/11
Sheet No. 41 of 49

Ecology Software (MTCAStat) Results, Area E

Mercury 95% UCL Calculation

DATA	ID
0.041	J1JCT4/ J1JCV1
0.0029	J1JCR9
0.0054	J1JCT0
0.0063	J1JCT1
0.0072	J1JCT2
0.0028	J1JCT3
0.011	J1JCT5
0.0025	J1JCT6
0.0027	J1JCT7
0.0027	J1JCT8
0.0062	J1JCT9
0.0028	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	0.0078
Censored		Lognormal mean	0.0071
Detection limit or PQL		Std. devn.	0.011
Method detection limit		Median	0.0041
TOTAL	12	Min.	0.0025
		Max.	0.041

Lognormal distribution? r-squared is: 0.796
Normal distribution? r-squared is: 0.496
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.013

Nickel 95% UCL Calculation

DATA	ID
11.6	J1JCT4/ J1JCV1
10.6	J1JCR9
13.6	J1JCT0
11.9	J1JCT1
9.1	J1JCT2
9.9	J1JCT3
9.4	J1JCT5
12.3	J1JCT6
10.2	J1JCT7
10.6	J1JCT8
11.0	J1JCT9
9.8	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	10.8
Censored		Lognormal mean	10.8
Detection limit or PQL		Std. devn.	1.3
Method detection limit		Median	10.6
TOTAL	12	Min.	9.1
		Max.	13.6

Lognormal distribution? r-squared is: 0.975
Normal distribution? r-squared is: 0.955
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.5

Vanadium 95% UCL Calculation

DATA	ID
37.0	J1JCT4/ J1JCV1
46.6	J1JCR9
38.1	J1JCT0
41.8	J1JCT1
37.8	J1JCT2
36.0	J1JCT3
36.3	J1JCT5
35.6	J1JCT6
41.0	J1JCT7
33.8	J1JCT8
37.3	J1JCT9
44.0	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	38.8
Censored		Lognormal mean	38.8
Detection limit or PQL		Std. devn.	3.8
Method detection limit		Median	37.6
TOTAL	12	Min.	33.8
		Max.	46.6

Lognormal distribution? r-squared is: 0.933
Normal distribution? r-squared is: 0.915
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 40.8

Zinc 95% UCL Calculation

DATA	ID
40.1	J1JCT4/ J1JCV1
35.1	J1JCR9
34.0	J1JCT0
37.5	J1JCT1
29.8	J1JCT2
30.9	J1JCT3
31.8	J1JCT5
39.0	J1JCT6
31.5	J1JCT7
34.1	J1JCT8
31.2	J1JCT9
37.0	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	34.3
Censored		Lognormal mean	34.3
Detection limit or PQL		Std. devn.	3.4
Method detection limit		Median	34.1
TOTAL	12	Min.	29.8
		Max.	40.1

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.949
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 36.2

TPH - motor oil 95% UCL Calculation

DATA	ID
1045	J1JCT4/ J1JCV1
550	J1JCR9
380000	J1JCT0
500	J1JCT1
12000	J1JCT2
2700	J1JCT3
1900	J1JCT5
500	J1JCT6
480	J1JCT7
1900	J1JCT8
1000	J1JCT9
500	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	33590
Censored		Lognormal mean	11949
Detection limit or PQL		Std. devn.	109138
Method detection limit		Median	1023
TOTAL	12	Min.	480
		Max.	380000

Lognormal distribution? r-squared is: 0.703
Normal distribution? r-squared is: NA
Recommendations:
Reject BOTH lognormal and normal distributions. Unable to analyze probability plot for normal case.
UCL (based on Z-statistic) is 85416

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
71	J1JCT4/ J1JCV1
26	J1JCR9
23	J1JCT0
76	J1JCT1
74	J1JCT2
70	J1JCT3
77	J1JCT5
74	J1JCT6
75	J1JCT7
69	J1JCT8
74	J1JCT9
72	J1JCV0

Number of samples		Uncensored values	
Uncensored	12	Mean	65
Censored		Lognormal mean	67
Detection limit or PQL		Std. devn.	19
Method detection limit		Median	73
TOTAL	12	Min.	23
		Max.	77

Lognormal distribution? r-squared is: 0.539
Normal distribution? r-squared is: 0.581
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 74

CALCULATION SHEET

Washington Closure Hanford
Originator: T. E. Queen
Project: 100-H Field Remediation
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date: 07/13/11
Job No.: 14655

Calc. No.: 0100H-CA-V0178
Checked: J. D. Skoglie

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Ecology Software (MTCAStat) Results, 128-H-1 Area F

Arsenic 95% UCL Calculation

DATA	ID
	J1JCV3/
3.9	J1JCW4
3.8	J1JCV2
3.4	J1JCV4
3.4	J1JCV5
4.0	J1JCV6
4.1	J1JCV7
3.3	J1JCV8
3.4	J1JCV9
3.4	J1JCW0
3.4	J1JCW1
3.2	J1JCW2
3.6	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	3.6
Censored		Lognormal mean	3.6
Detection limit or PQL		Std. devn.	0.30
Method detection limit		Median	3.4
TOTAL	12	Min.	3.2
		Max.	4.1

Lognormal distribution? r-squared is: 0.890
Normal distribution? r-squared is: 0.881
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.7

Barium 95% UCL Calculation

DATA	ID
	J1JCV3/
91.4	J1JCW4
84.3	J1JCV2
84.9	J1JCV4
93.9	J1JCV5
89.1	J1JCV6
97.6	J1JCV7
96.7	J1JCV8
74.3	J1JCV9
72.6	J1JCW0
67.3	J1JCW1
64.7	J1JCW2
88.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	83.8
Censored		Lognormal mean	83.9
Detection limit or PQL		Std. devn.	11.4
Method detection limit		Median	86.9
TOTAL	12	Min.	64.7
		Max.	97.6

Lognormal distribution? r-squared is: 0.915
Normal distribution? r-squared is: 0.932
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 90.6

Beryllium 95% UCL Calculation

DATA	ID
	J1JCV3/
0.27	J1JCW4
0.25	J1JCV2
0.27	J1JCV4
0.26	J1JCV5
0.28	J1JCV6
0.29	J1JCV7
0.28	J1JCV8
0.23	J1JCV9
0.24	J1JCW0
0.22	J1JCW1
0.17	J1JCW2
0.29	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	0.25
Censored		Lognormal mean	0.25
Detection limit or PQL		Std. devn.	0.035
Method detection limit		Median	0.27
TOTAL	12	Min.	0.17
		Max.	0.29

Lognormal distribution? r-squared is: 0.828
Normal distribution? r-squared is: 0.881
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.27

Boron 95% UCL Calculation

DATA	ID
	J1JCV3/
2.1	J1JCW4
1.5	J1JCV2
1.4	J1JCV4
1.9	J1JCV5
1.4	J1JCV6
1.6	J1JCV7
1.6	J1JCV8
1.4	J1JCV9
1.5	J1JCW0
1.8	J1JCW1
1.3	J1JCW2
1.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	1.6
Censored		Lognormal mean	1.6
Detection limit or PQL		Std. devn.	0.24
Method detection limit		Median	1.6
TOTAL	12	Min.	1.3
		Max.	2.1

Lognormal distribution? r-squared is: 0.938
Normal distribution? r-squared is: 0.923
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.7

Cadmium 95% UCL Calculation

DATA	ID
	J1JCV3/
0.089	J1JCW4
0.083	J1JCV2
0.082	J1JCV4
0.11	J1JCV5
0.070	J1JCV6
0.094	J1JCV7
0.097	J1JCV8
0.080	J1JCV9
0.076	J1JCW0
0.086	J1JCW1
0.069	J1JCW2
0.085	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	0.085
Censored		Lognormal mean	0.085
Detection limit or PQL		Std. devn.	0.012
Method detection limit		Median	0.084
TOTAL	12	Min.	0.069
		Max.	0.11

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.092

Chromium 95% UCL Calculation

DATA	ID
	J1JCV3/
12.5	J1JCW4
12.6	J1JCV2
15.2	J1JCV4
12.5	J1JCV5
12.4	J1JCV6
15.0	J1JCV7
12.5	J1JCV8
11.7	J1JCV9
11.8	J1JCW0
18.0	J1JCW1
9.3	J1JCW2
12.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	13.0
Censored		Lognormal mean	13.0
Detection limit or PQL		Std. devn.	2.2
Method detection limit		Median	12.5
TOTAL	12	Min.	9.3
		Max.	18.0

Lognormal distribution? r-squared is: 0.877
Normal distribution? r-squared is: 0.857
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 14.1

Cobalt 95% UCL Calculation

DATA	ID
	J1JCV3/
7.0	J1JCW4
7.1	J1JCV2
7.1	J1JCV4
7.0	J1JCV5
7.4	J1JCV6
7.4	J1JCV7
7.6	J1JCV8
6.8	J1JCV9
7.0	J1JCW0
7.2	J1JCW1
6.4	J1JCW2
7.7	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	7.1
Censored		Lognormal mean	7.1
Detection limit or PQL		Std. devn.	0.36
Method detection limit		Median	7.1
TOTAL	12	Min.	6.4
		Max.	7.7

Lognormal distribution? r-squared is: 0.953
Normal distribution? r-squared is: 0.960
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 7.3

Copper 95% UCL Calculation

DATA	ID
	J1JCV3/
12.8	J1JCW4
14.0	J1JCV2
14.1	J1JCV4
11.6	J1JCV5
13.8	J1JCV6
13.2	J1JCV7
13.4	J1JCV8
15.0	J1JCV9
14.1	J1JCW0
17.3	J1JCW1
15.1	J1JCW2
14.9	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	14.1
Censored		Lognormal mean	14.1
Detection limit or PQL		Std. devn.	1.42
Method detection limit		Median	14.1
TOTAL	12	Min.	11.6
		Max.	17.3

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.931
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.9

Lead 95% UCL Calculation

DATA	ID
	J1JCV3/
5.3	J1JCW4
6.7	J1JCV2
5.5	J1JCV4
5.4	J1JCV5
5.6	J1JCV6
5.7	J1JCV7
5.8	J1JCV8
5.3	J1JCV9
5.5	J1JCW0
5.3	J1JCW1
3.9	J1JCW2
6.1	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	5.5
Censored		Lognormal mean	5.5
Detection limit or PQL		Std. devn.	0.65
Method detection limit		Median	5.5
TOTAL	12	Min.	3.9
		Max.	6.7

Lognormal distribution? r-squared is: 0.777
Normal distribution? r-squared is: 0.825
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 5.8

CALCULATION SHEET

Washington Closure Hanford
Originator: T. E. Queen TQ
Project: 100-H Field Remediation
Subject: 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations

Date: 07/13/11
Job No.: 14655

Calc. No.: 0100H-CA-V0178
Checked: J. D. Skoglie JS

Rev. No.: 0
Date: 07/13/11
Sheet No.: 43 of 49

Ecology Software (MTCAStat) Results, 128-H-1 Area F

Manganese 95% UCL Calculation

DATA	ID
330	J1JCV3/ J1JCW4
315	J1JCV2
309	J1JCV4
342	J1JCV5
326	J1JCV6
359	J1JCV7
351	J1JCV8
305	J1JCV9
297	J1JCW0
291	J1JCW1
250	J1JCW2
342	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	318
Censored		Lognormal mean	318
Detection limit or PQL		Std. devn.	30.4
Method detection limit		Median	321
TOTAL	12	Min.	250
		Max.	359

Lognormal distribution? r-squared is: 0.917
Normal distribution? r-squared is: 0.945
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 336

Nickel 95% UCL Calculation

DATA	ID
12.2	J1JCV3/ J1JCW4
12.8	J1JCV2
13.9	J1JCV4
11.4	J1JCV5
12.6	J1JCV6
14.3	J1JCV7
12.4	J1JCV8
12.3	J1JCV9
12.4	J1JCW0
14.9	J1JCW1
10.6	J1JCW2
13.2	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	12.7
Censored		Lognormal mean	12.8
Detection limit or PQL		Std. devn.	1.2
Method detection limit		Median	12.5
TOTAL	12	Min.	10.6
		Max.	14.9

Lognormal distribution? r-squared is: 0.965
Normal distribution? r-squared is: 0.964
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.4

Vanadium 95% UCL Calculation

DATA	ID
38.0	J1JCV3/ J1JCW4
38.5	J1JCV2
38.6	J1JCV4
38.7	J1JCV5
40.0	J1JCV6
40.4	J1JCV7
41.7	J1JCV8
41.0	J1JCV9
40.1	J1JCW0
42.0	J1JCW1
40.1	J1JCW2
41.2	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	40.0
Censored		Lognormal mean	40.0
Detection limit or PQL		Std. devn.	1.3
Method detection limit		Median	40.1
TOTAL	12	Min.	38.0
		Max.	42.0

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 40.7

Zinc 95% UCL Calculation

DATA	ID
40.1	J1JCV3/ J1JCW4
38.8	J1JCV2
39.0	J1JCV4
41.9	J1JCV5
39.6	J1JCV6
43.8	J1JCV7
42.0	J1JCV8
37.8	J1JCV9
37.6	J1JCW0
38.4	J1JCW1
33.0	J1JCW2
41.6	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	39.5
Censored		Lognormal mean	39.5
Detection limit or PQL		Std. devn.	2.8
Method detection limit		Median	39.3
TOTAL	12	Min.	33.0
		Max.	43.8

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.923
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 41.0

TPH - diesel range 95% UCL Calculation

DATA	ID
338	J1JCV3/ J1JCW4
650	J1JCV2
345	J1JCV4
350	J1JCV5
330	J1JCV6
345	J1JCV7
345	J1JCV8
11000	J1JCV9
4300	J1JCW0
2800	J1JCW1
24000	J1JCW2
4600	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	4117
Censored		Lognormal mean	4448
Detection limit or PQL		Std. devn.	7021
Method detection limit		Median	500
TOTAL	12	Min.	330
		Max.	24000

Lognormal distribution? r-squared is: 0.820
Normal distribution? r-squared is: 0.604
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 7451

TPH - motor oil 95% UCL Calculation

DATA	ID
1150	J1JCV3/ J1JCW4
1400	J1JCV2
1200	J1JCV4
1100	J1JCV5
1400	J1JCV6
1000	J1JCV7
500	J1JCV8
26000	J1JCV9
7500	J1JCW0
7600	J1JCW1
25000	J1JCW2
8400	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	6854
Censored		Lognormal mean	7451
Detection limit or PQL		Std. devn.	9200
Method detection limit		Median	1400
TOTAL	12	Min.	500
		Max.	26000

Lognormal distribution? r-squared is: 0.876
Normal distribution? r-squared is: 0.690
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 11223

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
50	J1JCV3/ J1JCW4
23	J1JCV2
77	J1JCV4
74	J1JCV5
71	J1JCV6
73	J1JCV7
66	J1JCV8
23	J1JCV9
23	J1JCW0
23	J1JCW1
22	J1JCW2
23	J1JCW3

Number of samples		Uncensored values	
Uncensored	12	Mean	46
Censored		Lognormal mean	46
Detection limit or PQL		Std. devn.	25
Method detection limit		Median	36
TOTAL	12	Min.	22
		Max.	77

Lognormal distribution? r-squared is: 0.768
Normal distribution? r-squared is: 0.785
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 57

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen   Date 07/13/11   Calc. No. 0100H-CA-V0178   Rev. No. 0
Project 100-H Field Remediation   Job No. 14655   Checked J. D. Skoglie   Date 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations   Sheet No. 44 of 49

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	8910		16.7	46.1		0.835	75.3		0.420	0.262		0.167	2.71		1.67	0.088	B	0.21	3410		16.7	12.2		0.840	5.83		2.51
Duplicate of J1B856	J1B866	6/30/10	9250		15.7	46.6		0.784	84.5		0.390	0.276		0.157	2.85		1.57	0.086	B	0.20	3390		15.7	12.0		0.780	6.11		2.35

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
	TDL	5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	3.7%		11.5%				0.6%	1.7%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	13.1		1.67	16500		16.7	139		0.835	3510		4.18	302		0.835	0.338	B	0.835	10.4		2.09	1720		83.5	647		5.01
Duplicate of J1B856	J1B866	6/30/10	13.6		1.57	16500		15.7	137		0.784	3440		3.92	301		0.784	0.283	B	0.784	10.7		1.96	1790		78.4	1090		4.71

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon
	TDL	1	5	5	75	5	2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)
	RPD	3.7%	0.0%	1.4%	2.0%	0.3%				*51.0%*
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc			TPH - motor oil			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	197		41.8	36.9		0.835	43.9		2.51	21100		10100	4.22		3.38	32.7		3.38	47.1		3.38	30.2		3.38	26.6		3.38
Duplicate of J1B856	J1B866	6/30/10	215		39.2	38.6		0.784	44.1		2.35	31400		10000	3.51		3.34	32.4		3.34	75.7		3.34	43.8		3.34	44.3		3.34

Analysis:

		Sodium	Vanadium	Zinc	TPH - motor oil	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene
	TDL	50	2.5	1	5000	15	15	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD		4.5%	0.5%						
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	Yes - assess further	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area A

Sampling Area	HEIS Number	Sample Date	Benzo(k)fluoranthene			Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene			Fluoranthene (SVOA)			Pyrene (SVOA)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	14.9		3.38	5.19		3.38	99.3		3.38	2.87	J	3.38	16.9		3.38	50.0		3.38	96.4		3.38	145	J	145	209	J	319
Duplicate of J1B856	J1B866	6/30/10	32.0		3.34	7.67		3.34	114		3.34	2.51	J	3.34	46.4		3.34	34.8		3.34	99.2		3.34	57.0	J	327	58.3	J	327

Analysis:

		Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoranthene (SVOA)	Pyrene (SVOA)
	TDL	15	15	15	15	15	15	15	660	660
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)		
	RPD			13.8%				2.9%		
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen **Date** 07/13/11 **Calc. No.** 0100H-CA-V0178 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 45 of 49

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
B8	J1B887	6/29/10	11000		14.9	71.1		0.744	84.1		0.370	0.332		0.149	3.04		1.49	0.130	B	0.190	4090		14.9	14.0		0.740	6.75		2.23
Duplicate of J1B892	J1B892	6/29/10	11200		15.2	76.2		0.762	88.1		0.380	0.338		0.152	3.21		1.52	0.124	B	0.190	4220		15.2	14.3		0.760	6.58		2.29

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	1.8%	6.9%	4.6%				3.1%	2.1%	
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
B8	J1B887	6/29/10	11.3		1.49	19900		14.9	124		0.744	4220		3.72	342		0.744	0.217	B	0.744	11.1		1.86	2290		74.4	1450		4.47
Duplicate of J1B892	J1B892	6/29/10	12.0		1.52	20100		15.2	209		0.762	4220		3.81	351		0.762	0.233	B	0.762	11.1		1.91	2370		76.2	1360		4.57

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon
TDL		1	5	5	75	5	2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	6.0%	1.0%	51.1%	0.0%	2.6%			3.4%	6.4%
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc			TPH - motor oil			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
B8	J1B887	6/29/10	217		37.2	44.4		0.744	41.9		2.23	9720	J	10300	10.9		3.44	12.9		3.44	10.5		3.44	9.60		3.44	4.85		3.44
Duplicate of J1B892	J1B892	6/29/10	231		38.1	44.9		0.762	43.5		2.29	8470	J	10200	4.06		3.38	6.34		3.38	5.33		3.38	8.01		3.38	2.30	J	3.38

Analysis:

		Sodium	Vanadium	Zinc	TPH - motor oil	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene
TDL		50	2.5	1	5000	15	15	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	
	RPD		1.1%	3.7%						
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area B

Sampling Area	HEIS Number	Sample Date	Chrysene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
B8	J1B887	6/29/10	9.67		3.44	35.6		3.44	10.1		3.44	10.7		3.44	25.6		3.44
Duplicate of J1B892	J1B892	6/29/10	2.30	J	3.38	10.1		3.38	4.21		3.38	4.06		3.38	11.9		3.38

Analysis:

		Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
TDL		15	15	15	15	15
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD					
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen **Date** 07/13/11 **Calc. No.** 0100H-CA-V0178 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 46 of 49

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
C8	J1B8B0	6/29/10	8650		13.6	6.90		0.680	83.9		0.340	0.254		0.136	3.15		1.36	0.118	B	0.170	4140		13.6	12.8	J	0.680	6.06		2.03
Duplicate of J1B8B0	J1B8B5	6/29/10	8570		13.8	7.00		0.688	85.2		0.340	0.250		0.138	2.55		1.38	0.129	B	0.170	4080		13.8	12.1	J	0.690	6.06		2.06

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	0.9%		1.5%				1.5%	5.6%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	HEIS Number	Sample Date	Copper			Hexavalent chromium			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
C8	J1B8B0	6/29/10	14.0		1.36	0.14	B	0.20	17800		13.6	16.3		0.678	4370	J	3.39	276		0.68	0.301	B	0.678	9.96	J	1.70	1610		67.8
Duplicate of J1B8B0	J1B8B5	6/29/10	11.9		1.38	0.18	B	0.20	17900		13.8	17.5		0.688	4350	J	3.44	280		0.69	0.286	B	0.688	10.0	J	1.72	1620		68.8

Analysis:

		Copper	Hexavalent chromium	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium
TDL		1	0.5	5	5	75	5	2	4	400
Duplicate Analysis	Both > PQL?	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)		Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)
	RPD	16.2%		0.6%		0.5%	1.4%			
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	HEIS Number	Sample Date	Silicon			Sodium			Vanadium			Zinc			TPH - motor oil			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
C8	J1B8B0	6/29/10	1080	J	4.07	233		33.9	46.2	J	0.678	38.5		2.03	9130	J	9710	85.7	J	3.29	50.8	J	3.29	85.1	J	3.29	26.6	J	3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	1100	J	4.13	244		34.4	46.6	J	0.688	40.2		2.06	11600	J	9920	2.89	J	3.30	4.16	J	3.30	5.00	J	3.30	3.27	J	3.30

Analysis:

		Silicon	Sodium	Vanadium	Zinc	TPH - motor oil	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene
TDL		2	50	2.5	1	5000	15	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)			No-Stop (acceptable)	No-Stop (acceptable)	
	RPD	1.8%		0.9%	4.3%					
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	Yes - assess further	Yes - assess further	Yes - assess further	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area C

Sampling Area	HEIS Number	Sample Date	Benzo(k)fluoranthene			Chrysene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
C8	J1B8B0	6/29/10	26.2		3.29	105	J	3.29	261	J	3.29	22.5	J	3.29	50.3		3.29	181	J	3.29
Duplicate of J1B8B0	J1B8B5	6/29/10	1.87	J	3.30	3.29	J	3.30	8.59	J	3.30	1.39	J	3.30	4.46		3.30	5.95	J	3.30

Analysis:

		Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
TDL		15	15	15	15	15	15
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)
	Both >5xTDL?			No-Stop (acceptable)		No-Stop (acceptable)	No-Stop (acceptable)
	RPD						
	Difference > 2 TDL?	No - acceptable	Yes - assess further	Yes - assess further	No - acceptable	Yes - assess further	Yes - assess further

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen **Date** 07/13/11 **Calc. No.** 0100H-CA-V0178 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 47 of 49

Duplicate Analysis - 128-H-1 Waste Site Area D

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	12700		15.9	3.31		0.793	98.6		0.400	0.385		0.159	2.26		1.59	0.137	B	0.200	3970		15.9	15.0	J	0.793	7.44		2.38
Duplicate of J1B8C0	J1B8C8	6/29/10	12900		15.0	3.29		0.749	101		0.370	0.396		0.150	2.20		1.50	0.130	B	0.190	4010		15.0	15.2	J	0.749	7.67		2.25

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	1.6%		2.4%				1.0%	1.3%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area D

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	13.3		1.59	22500		15.9	5.03		0.793	5040	J	3.96	369		0.793	0.352	B	0.793	13.0	J	1.98	2220		79.3	1490	J	4.76
Duplicate of J1B8C0	J1B8C8	6/29/10	13.4		1.50	22700		15.0	5.09		0.749	5070	J	3.74	374		0.749	0.302	B	0.749	13.3	J	1.87	2280		74.9	1410	J	4.49

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon
TDL		1	5	5	75	5	2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	0.7%	0.9%		0.6%	1.3%			2.7%	5.5%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area D

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	267		39.6	47.8	J	0.793	42.5		2.38
Duplicate of J1B8C0	J1B8C8	6/29/10	277		37.4	49.0	J	0.749	43.9		2.25

Analysis:

		Sodium	Vanadium	Zinc
TDL		50	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)
	RPD	3.7%	2.5%	3.2%
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen	**Date** 07/13/11	**Calc. No.** 0100H-CA-V0178	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** J. D. Skoglie	**Date** 07/13/11
Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 48 of 49

Duplicate Analysis - 128-H-1 Waste Site Area E

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-6	J1JCT4	5/31/11	9290		1.3	5.9		0.57	88.2		0.065	0.16	B	0.028	2.8		0.84	0.11	B	0.035	3300		12.1	12.4		0.050	6.8		0.086
Duplicate of J1JCT4	J1JCV1	5/31/11	9810		1.5	6.0		0.64	87.8		0.074	0.17	B	0.032	2.7		0.95	0.11	B	0.040	3340		13.7	13.5		0.056	6.9		0.097

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
	TDL	5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	5.4%		0.5%				1.2%	8.5%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area E

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Mercury			Nickel			Potassium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
E-6	J1JCT4	5/31/11	13.2	X	0.19	16700		3.3	5.7		0.23	4260		3.2	324		0.086	0.0076	B	0.0053	11.4		0.11	2720		35.3	99.9		4.9
Duplicate of J1JCT4	J1JCV1	5/31/11	13.2	X	0.21	17300		3.7	5.4		0.26	4380		3.6	310		0.097	0.074		0.0057	11.7		0.12	2790		39.8	215		5.5

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silicon
	TDL	1	5	5	75	5	0.2	4	400	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	0.0%	3.5%		2.8%	4.4%			2.5%	73.1%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 128-H-1 Waste Site Area E

Sampling Area	HEIS Number	Sample Date	Sodium			Vanadium			Zinc			Bis(2-ethylhexyl)phthalate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
E-6	J1JCT4	5/31/11	217		50.7	35.9		0.081	39.6	X	0.34	76	JB	47
Duplicate of J1JCT4	J1JCV1	5/31/11	214		57.2	38.0		0.091	40.5	X	0.39	66	JB	45

Analysis:

		Sodium	Vanadium	Zinc	Bis(2-ethylhexyl)phthalate
	TDL	50	2.5	1	660
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD		5.7%	2.2%	
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator T. E. Queen | Date 07/13/11 | Calc. No. 0100H-CA-V0178 | Rev. No. 0

Project 100-H Field Remediation | Job No. 14655 | Checked J. D. Skoglie | Date 07/13/11

Subject 128-H-1 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 49 of 49

Duplicate Analysis - 128-H-1 Waste Site Area F

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	10200		1.5	3.9		0.65	93.4		0.075	0.27		0.033	2.1		0.97
Duplicate of J1JCV3	J1JCW4	5/26/11	10100		1.5	3.9		0.66	89.4		0.076	0.27		0.033	2.0		0.98

Sampling Area	Sample Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	0.091	B	0.041	3930		14.0	12.2		0.057	7.0	X	0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	0.087	B	0.041	3850		14.1	12.7		0.058	6.9	X	0.10

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt
TDL		5	10	2	0.2	2	0.2	100	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	1.0%		4.4%				2.1%	4.0%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area F

Sampling Area	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	12.5		0.21	19800		3.8	5.4		0.27	4600		3.7	330		0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	13.0		0.22	19600		3.8	5.2		0.27	4710		3.7	329		0.10

Sampling Area	HEIS Number	Sample Date	Nickel			Potassium			Silicon			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
F-2	J1JCV3	5/26/11	11.9		0.12	2040		40.6	317		5.6	197		58.4
Duplicate of J1JCV3	J1JCW4	5/26/11	12.4		0.12	2070		40.9	289		5.6	195		58.8

Analysis:

		Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Silicon	Sodium
TDL		1	5	5	75	5	4	400	2	50
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	3.9%	1.0%		2.4%	0.3%		1.5%	9.2%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 128-H-1 Waste Site Area F

Sampling Area	HEIS Number	Sample Date	Vanadium			Zinc			TPH - motor oil		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
F-2	J1JCV3	5/26/11	38.1		0.093	39.8		0.39	1100	J	1000
Duplicate of J1JCV3	J1JCW4	5/26/11	37.8		0.094	40.3		0.40	1200	J	960

Analysis:

		Vanadium	Zinc	TPH - motor oil
TDL		2.5	1	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	0.8%	1.2%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	8910		16.7	0.835	U	0.835	46.1		0.835	75.3		0.42	0.262		0.167
Duplicate of J1B856	J1B866	6/30/10	9250		15.7	0.784	U	0.784	46.6		0.784	84.5		0.39	0.276		0.157
A1	J1B854	6/30/10	8070		17.5	0.874	U	0.874	15.1		0.874	70.0		0.44	0.219		0.175
A2	J1B855	6/30/10	10400		16.9	0.844	U	0.844	23.5		0.844	79.5		0.42	0.302		0.169
A4	J1B857	6/30/10	9350		16.4	0.820	U	0.820	56.8		0.820	81.6		0.41	0.276		0.164
A5	J1B858	6/30/10	9360		17.4	0.870	U	0.870	31.8		0.870	69.0		0.44	0.271		0.174
A6	J1B859	6/30/10	9300		17.1	0.855	U	0.855	42.4		0.855	77.8		0.43	0.275		0.171
A7	J1B860	6/30/10	8400		16.9	0.845	U	0.845	29.7		0.845	79.1		0.42	0.241		0.169
A8	J1B861	6/30/10	8940		16.8	0.839	U	0.839	33.8		0.839	83.7		0.42	0.253		0.168
A9	J1B862	6/30/10	9080		13.4	0.669	U	0.669	25.0		0.669	81.7		0.34	0.264		0.134
A-9[a]	J1JVX2	6/16/11	9060		1.40	0.350	U	0.350	40.5		0.350	80.1		0.070	0.210		0.031
A10	J1B863	6/30/10	10800		19.0	0.949	U	0.949	47.6		0.949	85.5		0.47	0.321		0.190
A11	J1B864	6/30/10	7060		13.6	0.678	U	0.678	16.5		0.678	72.1		0.34	0.200		0.136
A12	J1B865	6/30/10	8230		16.4	0.822	U	0.822	17.3		0.822	105		0.41	0.184		0.164
B8	J1B887	6/29/10	11000		14.9	0.744	U	0.744	71.1		0.744	84.1		0.37	0.332		0.149
Duplicate of J1B887	J1B892	6/29/10	11200		15.2	0.762	U	0.762	76.2		0.762	88.1		0.38	0.338		0.152
B1	J1B880	6/29/10	9580		16.7	0.836	U	0.836	39.5		0.836	73.9		0.42	0.281		0.167
B2	J1B881	6/29/10	10300		16.0	0.801	U	0.801	43.8		0.801	75.7		0.40	0.307		0.160
B3	J1B882	6/29/10	11200		14.2	0.711	U	0.711	45.1		0.711	80.2		0.36	0.334		0.142
B4	J1B883	6/29/10	11000		18.1	0.904	U	0.904	39.1		0.904	80.4		0.45	0.324		0.181
B13[b]	J1B884	6/29/10	11300		20.2	1.01	U	1.01	24.8		1.01	86.1		0.51	0.336		0.202
B6	J1B885	6/29/10	10500		19.0	0.95	U	0.95	12.9		0.950	82.0		0.48	0.281		0.190
B7	J1B886	6/29/10	11400		15.0	0.752	U	0.752	14.2		0.752	78.3		0.38	0.351		0.150
B9	J1B888	6/29/10	10700		16.3	0.814	U	0.814	36.5		0.814	80.6		0.41	0.316		0.163
B10	J1B889	6/29/10	9420		17.5	0.877	U	0.877	47.6		0.877	76.3		0.44	0.281		0.175
B11	J1B890	6/29/10	11100		16.0	0.801	U	0.801	97.7		0.801	86.8		0.40	0.341		0.160
B12	J1B891	6/29/10	11000		17.0	0.848	U	0.848	16.0		0.848	113		0.42	0.380		0.170
C8	J1B8B0	6/29/10	8650		13.6	0.239	JB	0.680	6.90		0.680	83.9		0.34	0.254		0.136
Duplicate of J1B8B0	J1B8B5	6/29/10	8570		13.8	0.688	UJ	0.688	7.00		0.688	85.2		0.34	0.250		0.138
C1	J1B893	6/17/10	8190		14.2	0.711	U	0.711	3.92		0.711	126		0.36	0.270		0.142
C2	J1B894	6/17/10	8790		15.0	0.751	U	0.751	4.01		0.751	114		0.38	0.282		0.150
C3	J1B895	6/17/10	10000		12.9	0.644	U	0.644	3.41		0.644	89.2		0.32	0.299		0.129
C4	J1B896	6/17/10	10500		16.5	0.823	U	0.823	3.19		0.823	102		0.41	0.309		0.165
C5	J1B897	6/17/10	10700		17.9	0.894	U	0.894	3.65		0.894	97.9		0.45	0.318		0.179
C6	J1B8B1	6/17/10	10600		16.7	0.837	U	0.837	4.38		0.837	97.3		0.42	0.306		0.167
C7	J1B899	6/29/10	7380		15.5	0.774	UJ	0.774	2.50		0.774	50.9		0.39	0.213		0.155
C9	J1B898	6/29/10	9880		15.2	0.762	UJ	0.762	9.36		0.762	90		0.38	0.289		0.152
C10	J1B8B2	6/29/10	8190		13.1	0.657	UJ	0.657	18.6		0.657	102		0.33	0.292		0.131
C11	J1B8B3	6/29/10	8440		15.1	0.753	UJ	0.753	11.2		0.753	72.2		0.38	0.247		0.151
C12	J1B8B4	6/29/10	10100		15.3	0.765	UJ	0.765	15.6		0.765	77.5		0.38	0.296		0.153

[a] = resample collected due to dieldrin exceedance
[b] = Sample B-13 was mislabeled in the verification work instruction.
There are a total of 12 samples for this decision unit.
B = organics: method blank contamination, inorganics: estimated result
D = result reported from a dilution
J = organics: estimated result; inorganics: method blank contamination
K = unresolved due to matrix interference
M = sample duplicate precision not met
N = recovery outside control limits
ND = not detected (asbestos)

Attachment 1 Sheet No. 1 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

PQL = practical quantitation limit
Q = qualifier
U = undetected
X = more than 40% difference between the primary and confirmation detector results, lower result reported

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	12700		15.9	0.793	UJ	0.793	3.31		0.793	98.6		0.40	0.385		0.159
Duplicate of J1B8C0	J1B8C8	6/29/10	12900		15.0	0.749	UJ	0.749	3.29		0.749	101		0.37	0.396		0.150
D1	J1B8B6	6/29/10	11000		14.9	0.743	UJ	0.743	3.46		0.743	98.7		0.37	0.338		0.149
D2	J1B8B7	6/29/10	6910		19.8	0.990	UJ	0.990	3.14		0.990	105		0.50	0.240		0.198
D3	J1B8B8	6/29/10	9840		13.5	0.677	UJ	0.677	3.31		0.677	91.4		0.34	0.301		0.135
D4	J1B8B9	6/29/10	9000		17.6	0.881	UJ	0.881	2.75		0.881	71.4		0.44	0.263		0.176
D6	J1B8C1	6/29/10	7620		16.0	0.798	UJ	0.798	2.96		0.798	76.5		0.40	0.211		0.160
D7	J1B8C2	6/29/10	9300		13.6	0.680	UJ	0.680	2.78		0.680	85.7		0.34	0.279		0.136
D8	J1B8C3	6/29/10	7330		13.6	0.680	UJ	0.680	2.26		0.680	58.1		0.34	0.205		0.136
D9	J1B8C4	6/29/10	10900		16.1	0.806	UJ	0.806	3.57		0.806	85.1		0.40	0.328		0.161
D10	J1B8C5	6/29/10	8130		16.4	0.822	UJ	0.822	6.68		0.822	107		0.41	0.272		0.164
D11	J1B8C6	6/29/10	9590		12.7	0.635	UJ	0.635	10.7		0.635	97.2		0.32	0.290		0.127
D12	J1B8C7	6/29/10	8670		15.1	0.757	UJ	0.757	3.8		0.757	61.4		0.38	0.245		0.151
E-6	J1JCT4	5/31/11	9290		1.3	0.33	U	0.33	5.9		0.57	88.2		0.065	0.16	B	0.028
Duplicate of J1JCT4	J1JCV1	5/31/11	9810		1.5	0.37	U	0.37	6.0		0.64	87.8		0.074	0.17	B	0.032
E-1	J1JCR9	5/31/11	6830		1.7	0.41	U	0.41	3.7	M	0.72	60.7		0.083	0.036	U	0.036
E-2	J1JCT0	5/31/11	5660		1.4	0.33	U	0.33	2.2		0.58	51.4		0.067	0.029	U	0.029
E-3	J1JCT1	5/31/11	8430		1.5	0.38	U	0.38	2.5		0.66	71.2		0.076	0.066	B	0.033
E-4	J1JCT2	5/31/11	5420		1.4	0.35	U	0.35	1.7		0.61	49.7		0.070	0.031	U	0.031
E-5	J1JCT3	5/31/11	5380		1.3	0.33	U	0.33	4.1		0.57	52.6		0.066	0.029	U	0.029
E-7	J1JCT5	5/31/11	5550		1.5	0.37	U	0.37	3.1		0.64	52.6		0.073	0.032	U	0.032
E-8	J1JCT6	5/31/11	8550		1.4	0.35	U	0.35	2.9		0.61	70.7		0.071	0.13	B	0.031
E-9	J1JCT7	5/31/11	6130		1.5	0.36	U	0.36	2.7		0.63	49.8		0.073	0.032	U	0.032
E-10	J1JCT8	5/31/11	7920		1.5	0.37	U	0.37	4.5		0.64	74.0		0.074	0.11	B	0.032
E-11	J1JCT9	5/31/11	6660		1.5	0.36	U	0.36	2.5		0.63	41.6		0.073	0.068	B	0.032
E-12	J1JCV0	5/31/11	5790		1.6	0.38	U	0.38	1.7		0.67	43.6		0.077	0.033	U	0.033
F-2	J1JCV3	5/26/11	10200		1.5	0.38	U	0.38	3.9		0.65	93.4		0.075	0.27		0.033
Duplicate of J1JCV3	J1JCW4	5/26/11	10100		1.5	0.38	U	0.38	3.9		0.66	89.4		0.076	0.27		0.033
F-1	J1JCV2	5/26/11	9670		1.5	0.37	U	0.37	3.8		0.65	84.3		0.075	0.25		0.032
F-3	J1JCV4	5/26/11	9890		1.5	0.36	U	0.36	3.4		0.63	84.9		0.073	0.27		0.032
F-4	J1JCV5	5/26/11	10200		1.5	0.36	U	0.36	3.4		0.63	93.9		0.073	0.26		0.032
F-5	J1JCV6	5/26/11	10500		1.4	0.34	U	0.34	4.0		0.60	89.1		0.069	0.28		0.030
F-6	J1JCV7	5/26/11	11100		1.6	0.39	U	0.39	4.1		0.68	97.6		0.078	0.29		0.034
F-7	J1JCV8	5/26/11	10800		1.4	0.35	U	0.35	3.3		0.61	96.7		0.070	0.28		0.031
F-8	J1JCV9	5/26/11	9070		1.5	0.37	U	0.37	3.4		0.65	74.3		0.075	0.23		0.032
F-9	J1JCW0	5/26/11	9170		1.4	0.35	U	0.35	3.4		0.61	72.6		0.070	0.24		0.030
F-10	J1JCW1	5/26/11	9540		1.6	0.39	U	0.39	3.4		0.67	67.3		0.077	0.22		0.034
F-11	J1JCW2	5/26/11	7500		1.4	0.35	U	0.35	3.2		0.61	64.7		0.071	0.17	B	0.031
F-12	J1JCW3	5/26/11	10700		1.4	0.34	U	0.34	3.6		0.59	88.9		0.068	0.29		0.030
Equipment blank	J1B853	6/30/10	147		16.7	0.834	U	0.834	0.834	U	0.834	1.42		0.42	0.167	U	0.17
Equipment blank	J1JCW5	5/26/11	192		1.5	0.36	U	0.36	0.62	U	0.62	2.2		0.072	0.031	U	0.031

Attachment	1	Sheet No.	2 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	2.71		1.67	0.088	B	0.21	3410		16.7	12.2		0.84	5.83		2.51
Duplicate of J1B856	J1B866	6/30/10	2.85		1.57	0.086	B	0.20	3390		15.7	12.0		0.78	6.11		2.35
A1	J1B854	6/30/10	1.96		1.75	0.187	B	0.22	15500		17.5	10.8		0.87	6.37		2.62
A2	J1B855	6/30/10	2.37		1.69	0.122	B	0.21	3540		16.9	14.6		0.84	6.69		2.53
A4	J1B857	6/30/10	3.20		1.64	0.148	B	0.21	3830		16.4	13.0		0.82	6.16		2.46
A5	J1B858	6/30/10	2.53		1.74	0.113	B	0.22	3310		17.4	12.7		0.87	6.14		2.61
A6	J1B859	6/30/10	2.79		1.71	0.179	B	0.21	3550		17.1	13.1		0.86	5.95		2.56
A7	J1B860	6/30/10	3.17		1.69	0.177	B	0.21	3670		16.9	11.6		0.85	5.47		2.54
A8	J1B861	6/30/10	2.58		1.68	0.091	B	0.21	3440		16.8	12.7		0.84	5.92		2.52
A9	J1B862	6/30/10	3.10		1.34	0.181	[illegible]	0.17	3480		13.4	12.0		0.67	5.72		2.01
A-9[a]	J1JVX2	6/16/11	2.80		0.91	0.290		0.038	3680		13.0	12.4		0.054	6.6		0.092
A10	J1B863	6/30/10	2.66		1.90	0.116	B	0.24	3480		19.0	13.7		0.95	6.75		2.85
A11	J1B864	6/30/10	2.11		1.36	0.121	B	0.17	4360		13.6	10.2		0.68	6.84		2.04
A12	J1B865	6/30/10	1.93		1.64	0.114	B	0.21	5080		16.4	12.6		0.82	6.8		2.47
B8	J1B887	6/29/10	3.04		1.49	0.130	B	0.19	4090		14.9	14.0		0.74	6.75		2.23
Duplicate of J1B892	J1B892	6/29/10	3.21		1.52	0.124	B	0.19	4220		15.2	14.3		0.76	6.58		2.29
B1	J1B880	6/29/10	2.11		1.67	0.196	B	0.21	3560		16.7	14.4		0.84	6.04		2.51
B2	J1B881	6/29/10	2.17		1.60	0.112	B	0.20	3670		16.0	13.5		0.80	6.22		2.40
B3	J1B882	6/29/10	2.06		1.42	0.085	B	0.18	3940		14.2	14.7		0.71	6.70		2.13
B4	J1B883	6/29/10	2.01		1.81	0.123	B	0.23	3660		18.1	14.5		0.90	6.68		2.71
B13[b]	J1B884	6/29/10	2.93		2.02	0.143	B	0.25	4100		20.2	14.4		1.01	6.87		3.04
B6	J1B885	6/29/10	3.51		1.90	0.158	B	0.24	4300		19.0	13.0		0.95	6.02		2.85
B7	J1B886	6/29/10	2.19		1.50	0.105	B	0.19	4070		15.0	14.9		0.75	7.03		2.26
B9	J1B888	6/29/10	2.52		1.63	0.146	B	0.20	3760		16.3	13.2		0.81	6.61		2.44
B10	J1B889	6/29/10	2.85		1.75	0.124	B	0.22	3600		17.5	12.7		0.88	5.94		2.63
B11	J1B890	6/29/10	2.37		1.60	0.104	B	0.20	3820		16.0	13.9		0.80	6.81		2.40
B12	J1B891	6/29/10	5.53		1.70	0.161	B	0.21	4800		17.0	18.8		0.85	7.33		2.54
C8	J1B8B0	6/29/10	3.15		1.36	0.118	B	0.17	4140		13.6	12.8	J	0.68	6.06		2.03
Duplicate of J1B8B0	J1B8B5	6/29/10	2.55		1.38	0.129	B	0.17	4080		13.8	12.1	J	0.69	6.06		2.06
C1	J1B893	6/17/10	8.00		1.42	0.187		0.18	4090		14.2	11.6		0.71	6.06		2.13
C2	J1B894	6/17/10	7.13		1.50	0.159	B	0.19	4050		15.0	12.4		0.75	6.13		2.25
C3	J1B895	6/17/10	2.31		1.29	0.101	B	0.16	3190		12.9	12.6		0.64	6.89		1.93
C4	J1B896	6/17/10	2.83		1.65	0.130	B	0.21	3760		16.5	13.6		0.82	7.65		2.47
C5	J1B897	6/17/10	2.72		1.79	0.131	B	0.22	3270		17.9	12.3		0.89	7.10		2.68
C6	J1B8B1	6/17/10	3.76		1.67	0.148	B	0.21	3550		16.7	12.4		0.84	7.21		2.51
C7	J1B899	6/29/10	1.69		1.55	0.123	B	0.19	5500		15.5	12.9	J	0.77	5.87		2.32
C9	J1B898	6/29/10	3.47		1.52	0.130	B	0.19	4450		15.2	14.3	J	0.76	6.38		2.29
C10	J1B8B2	6/29/10	5.28		1.31	0.191		0.16	3910		13.1	15.8	J	0.66	5.17		1.97
C11	J1B8B3	6/29/10	2.02		1.51	0.111	B	0.19	3370		15.1	12.6	J	0.75	5.09		2.26
C12	J1B8B4	6/29/10	2.31		1.53	0.105	B	0.19	3820		15.3	13.4	J	0.77	6.17		2.29

Attachment	1	Sheet No.	3 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	2.26		1.59	0.137	B	0.20	3970		15.9	15.0	J	0.793	7.44		2.38
Duplicate of J1B8C0	J1B8C8	6/29/10	2.2		1.50	0.13	B	0.19	4010		15.0	15.2	J	0.749	7.67		2.25
D1	J1B8B6	6/29/10	3.53		1.49	0.129	B	0.19	3830		14.9	14.5	J	0.743	6.81		2.23
D2	J1B8B7	6/29/10	7.11		1.98	0.191	B	0.25	5140		19.8	11.3	J	0.990	5.14		2.97
D3	J1B8B8	6/29/10	3.26		1.35	0.108	B	0.17	3740		13.5	13.3	J	0.677	6.26		2.03
D4	J1B8B9	6/29/10	2.21		1.76	0.153	B	0.22	4960		17.6	14.6	J	0.881	7.05		2.64
D6	J1B8C1	6/29/10	3.42		1.60	0.144	B	0.20	5160		16.0	12.9	J	0.798	5.82		2.40
D7	J1B8C2	6/29/10	1.99		1.36	0.129	B	0.17	4430		13.6	12.2	J	0.680	7.10		2.04
D8	J1B8C3	6/29/10	1.61		1.36	0.123	B	0.17	5060		13.6	12.1	J	0.680	6.34		2.04
D9	J1B8C4	6/29/10	1.91		1.61	0.146	B	0.20	3650		16.1	13.4	J	0.806	6.59		2.42
D10	J1B8C5	6/29/10	6.91		1.64	0.227		0.21	4450		16.4	12.5	J	0.822	6.10		2.47
D11	J1B8C6	6/29/10	4.12		1.27	0.14	B	0.16	5110		12.7	16.4	J	0.635	6.13		1.90
D12	J1B8C7	6/29/10	1.91		1.51	0.119	B	0.19	4130		15.1	14.7	J	0.757	6.26		2.27
E-6	J1JCT4	5/31/11	2.8		0.84	0.11	B	0.035	3300		12.1	12.4		0.050	6.8		0.086
Duplicate of J1JCT4	J1JCV1	5/31/11	2.7		0.95	0.11	B	0.040	3340		13.7	13.5		0.056	6.9		0.097
E-1	J1JCR9	5/31/11	1.1	B	1.1	0.063	B	0.045	3980		15.4	11.0		0.063	6.9		0.11
E-2	J1JCT0	5/31/11	0.98	B	0.86	0.064	B	0.036	3860		12.4	16.5		0.051	5.9		0.088
E-3	J1JCT1	5/31/11	1.3	B	0.98	0.086	B	0.041	5060		14.1	10.7		0.058	7.6		0.10
E-4	J1JCT2	5/31/11	0.91	U	0.91	0.041	B	0.038	3440		13.1	9.7		0.054	5.8		0.093
E-5	J1JCT3	5/31/11	0.85	U	0.85	0.041	B	0.036	3720		12.3	9.4		0.050	5.1		0.087
E-7	J1JCT5	5/31/11	0.94	U	0.94	0.048	B	0.040	2950		13.6	10.8		0.056	5.2		0.096
E-8	J1JCT6	5/31/11	1.3	B	0.91	0.076	B	0.038	5340		13.1	13.3		0.054	6.3		0.093
E-9	J1JCT7	5/31/11	0.94	U	0.94	0.039	U	0.039	3610		13.5	11.0		0.056	5.7		0.096
E-10	J1JCT8	5/31/11	1.6	B	0.95	0.083	B	0.04	3470		13.6	11.8		0.056	5.8		0.097
E-11	J1JCT9	5/31/11	0.94	U	0.94	0.042	B	0.039	5970		13.5	12.8		0.056	5.6		0.096
E-12	J1JCV0	5/31/11	0.99	U	0.99	0.045	B	0.041	3480		14.2	9.6		0.058	6.6		0.10
F-2	J1JCV3	5/26/11	2.1		0.97	0.091	B	0.041	3930		14.0	12.2		0.057	7.0	X	0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	2.0		0.98	0.087	B	0.041	3850		14.1	12.7		0.058	6.9	X	0.10
F-1	J1JCV2	5/26/11	1.5	B	0.96	0.083	B	0.040	4060		13.8	12.6		0.057	7.1	X	0.098
F-3	J1JCV4	5/26/11	1.4	B	0.94	0.082	B	0.039	4430		13.5	15.2		0.056	7.1	X	0.096
F-4	J1JCV5	5/26/11	1.9		0.94	0.11	B	0.039	3470		13.5	12.5		0.056	7.0	X	0.096
F-5	J1JCV6	5/26/11	1.4	B	0.89	0.070	B	0.037	3840		12.8	12.4		0.053	7.4	X	0.091
F-6	J1JCV7	5/26/11	1.6	B	1.0	0.094	B	0.042	3820		14.5	15.0		0.060	7.4	X	0.10
F-7	J1JCV8	5/26/11	1.6	B	0.91	0.097	B	0.038	3730		13.0	12.5		0.054	7.6	X	0.092
F-8	J1JCV9	5/26/11	1.4	B	0.96	0.080	B	0.040	4720		13.8	11.7		0.057	6.8	X	0.098
F-9	J1JCW0	5/26/11	1.5	B	0.90	0.076	B	0.038	5030		12.9	11.8		0.053	7.0	X	0.092
F-10	J1JCW1	5/26/11	1.8	B	1.0	0.086	B	0.042	7490		14.3	18.0		0.059	7.2	X	0.10
F-11	J1JCW2	5/26/11	1.3	B	0.91	0.069	B	0.038	9080		13.1	9.3		0.054	6.4	X	0.093
F-12	J1JCW3	5/26/11	1.9		0.88	0.085	B	0.037	4140		12.6	12.9		0.052	7.7	X	0.089
Equipment blank	J1B853	6/30/10	1.67	U	1.67	0.209	U	0.21	32.7		16.7	0.524	B	0.83	0.11	BX	0.094
Equipment blank	J1JCW5	5/26/11	0.92	U	0.92	0.039	U	0.039	43.5	B	13.3	0.13	B	0.055			

Attachment	1	Sheet No.	4 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium			Manganese		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	13.1		1.67	0.20	U	0.20	16500		16.7	139		0.835	3510		4.18	302		0.835
Duplicate of J1B856	J1B866	6/30/10	13.6		1.57	0.20	U	0.20	16500		15.7	137		0.784	3440		3.92	301		0.784
A1	J1B854	6/30/10	13.1		1.75	0.20	U	0.20	18900		17.5	73.6		0.874	4000		4.37	301		0.874
A2	J1B855	6/30/10	13.8		1.69	0.20	U	0.20	19500		16.9	84.2		0.844	4250		4.22	329		0.844
A4	J1B857	6/30/10	12.6		1.64	0.21	U	0.21	18200		16.4	406		0.820	3720		4.10	331		0.820
A5	J1B858	6/30/10	12.3		1.74	0.20	U	0.20	17800		17.4	164		0.870	3710		4.35	304		0.870
A6	J1B859	6/30/10	12.7		1.71	0.21	U	0.21	17800		17.1	278		0.855	3620		4.27	300		0.855
A7	J1B860	6/30/10	12.8		1.69	0.20	U	0.20	16300		16.9	319		0.845	3640		4.23	289		0.845
A8	J1B861	6/30/10	12.0		1.68	0.20	U	0.20	17100		16.8	98		0.839	3480		4.20	291		0.839
[redacted]																				
A-9[a]	J1JVX2	6/16/11	14.0		0.20	0.155	U	0.16	16900		3.50	348	X	0.15	3810		3.40	311		0.15
A10	J1B863	6/30/10	13.7		1.9	0.20	U	0.20	19200		19.0	224		0.949	3980		4.74	326		0.949
A11	J1B864	6/30/10	13.8		1.36	0.20	U	0.20	18600		13.6	88.3		0.678	3510		3.39	282		0.678
A12	J1B865	6/30/10	13.0		1.64	0.20	U	0.20	18800		16.4	86.0		0.822	3940		4.11	302		0.822
B8	J1B887	6/29/10	11.3		1.49	0.21	U	0.21	19900		14.9	124		0.744	4220		3.72	342		0.744
Duplicate of J1B892	J1B892	6/29/10	12.0		1.52	0.21	U	0.21	20100		15.2	209		0.762	4220		3.81	351		0.762
B1	J1B880	6/29/10	10.2		1.67	0.20	U	0.20	19000		16.7	98.3		0.836	3690		4.18	303		0.836
B2	J1B881	6/29/10	10.7		1.60	0.21	U	0.21	18900		16.0	43.6		0.801	4010		4.00	315		0.801
B3	J1B882	6/29/10	13.1		1.42	0.20	U	0.20	20400		14.2	24.0		0.711	4300		3.56	324		0.711
B4	J1B883	6/29/10	12.2		1.81	0.21	U	0.21	19900		18.1	48.3		0.904	4220		4.52	335		0.904
B13[b]	J1B884	6/29/10	12.4		2.02	0.21	U	0.21	20800		20.2	58.3		1.01	4330		5.06	347		1.01
B6	J1B885	6/29/10	13.0		1.90	0.20	U	0.20	18800		19.0	166		0.95	3930		4.75	296		0.95
B7	J1B886	6/29/10	13.5		1.50	0.20	U	0.20	20900		15.0	9.41		0.752	4650		3.76	337		0.752
B9	J1B888	6/29/10	11.3		1.63	0.21	U	0.21	19400		16.3	178		0.814	4090		4.07	341		0.814
B10	J1B889	6/29/10	10.3		1.75	0.20	U	0.20	18300		17.5	125		0.877	3700		4.39	299		0.877
B11	J1B890	6/29/10	11.8		1.60	0.21	U	0.21	20200		16.0	95.7		0.801	4070		4.01	354		0.801
B12	J1B891	6/29/10	16.8		1.70	0.21	U	0.21	22100		17.0	30.1		0.848	4630		4.24	345		0.848
C8	J1B8B0	6/29/10	14.0		1.36	0.14	B	0.20	17800		13.6	16.3		0.678	4370	J	3.39	276		0.678
Duplicate of J1B8B0	J1B8B5	6/29/10	11.9		1.38	0.18	B	0.20	17900		13.8	17.5		0.688	4350	J	3.44	280		0.688
C1	J1B893	6/17/10	14.4		1.42	0.18	B	0.21	17400		14.2	21.2		0.711	3910		3.56	270		0.711
C2	J1B894	6/17/10	12.8		1.50	0.16	B	0.20	16200		15.0	18.8		0.751	3930		3.75	270		0.751
C3	J1B895	6/17/10	13.1		1.29	0.11	B	0.20	17600		12.9	4.99		0.644	4380		3.22	290		0.644
C4	J1B896	6/17/10	15.0		1.65	0.14	B	0.20	19600		16.5	4.78		0.823	5100		4.11	320		0.823
C5	J1B897	6/17/10	13.3		1.79	0.19	B	0.21	18500		17.9	5.69		0.894	4220		4.47	314		0.894
C6	J1B8B1	6/17/10	13.3		1.67	0.11	B	0.22	19600		16.7	13.1		0.837	4330		4.19	326		0.837
C7	J1B899	6/29/10	15.5		1.55	0.18	B	0.20	16500		15.5	5.07		0.774	5180	J	3.87	235		0.774
C9	J1B898	6/29/10	13.8		1.52	0.16	B	0.20	19900		15.2	37.9		0.762	4560	J	3.81	305		0.762
C10	J1B8B2	6/29/10	11.9		1.31	0.11	B	0.20	14900		13.1	198		0.657	3730	J	3.29	250		0.657
C11	J1B8B3	6/29/10	8.93		1.51	0.20	U	0.20	15300		15.1	32.0		0.753	3840	J	3.76	249		0.753
C12	J1B8B4	6/29/10	12.2		1.53	0.20	U	0.20	17700		15.3	43.6		0.765	4220	J	3.82	287		0.765

Attachment	1	Sheet No.	5 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Copper			Hexavalent chromium			Iron			Lead			Magnesium			Manganese		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	13.3		1.59	0.20	U	0.20	22500		15.9	5.03		0.793	5040	J	3.96	369		0.793
Duplicate of J1B8C0	J1B8C8	6/29/10	13.4		1.50	0.11	B	0.22	22700		15.0	5.09		0.749	5070	J	3.74	374		0.749
D1	J1B8B6	6/29/10	12.1		1.49	0.16	B	0.20	18600		14.9	3.75		0.743	5070	J	3.71	326		0.743
D2	J1B8B7	6/29/10	12.6		1.98	0.21	U	0.21	14100		19.8	19.9		0.990	3900	J	4.95	222		0.990
D3	J1B8B8	6/29/10	12.0		1.35	0.20	U	0.20	17100		13.5	4.08		0.677	4890	J	3.38	284		0.677
D4	J1B8B9	6/29/10	13.6		1.76	0.21	U	0.21	22100		17.6	6.90		0.881	4430	J	4.40	310		0.881
D6	J1B8C1	6/29/10	13.7		1.60	0.070	B	0.20	17100		16.0	19.6		0.798	3890	J	3.99	267		0.798
D7	J1B8C2	6/29/10	12.3		1.36	0.14	B	0.20	21200		13.6	4.90		0.680	4070	J	3.40	333		0.680
D8	J1B8C3	6/29/10	11.7		1.36	0.16	B	0.20	20400		13.6	4.67		0.680	4150	J	3.40	282		0.680
D9	J1B8C4	6/29/10	10.9		1.61	0.18	B	0.21	19800		16.1	5.13		0.806	4300	J	4.03	343		0.806
D10	J1B8C5	6/29/10	17.4		1.64	0.09	B	0.20	17600		16.4	74.9		0.822	3800	J	4.11	275		0.822
D11	J1B8C6	6/29/10	13.8		1.27	0.12	B	0.20	17800		12.7	44.4		0.635	3830	J	3.17	277		0.635
D12	J1B8C7	6/29/10	12.5		1.51	0.17	B	0.20	19500		15.1	14.4		0.757	4300	J	3.79	284		0.757
E-6	J1JCT4	5/31/11	13.2	X	0.19	0.154	U	0.15	16700		3.3	5.7		0.23	4260		3.2	324		0.086
Duplicate of J1JCT4	J1JCV1	5/31/11	13.2	X	0.21	0.154	U	0.15	17300		3.7	5.4		0.26	4380		3.6	310		0.097
E-1	J1JCR9	5/31/11	15.9	X	0.24	0.155	U	0.155	16700		4.1	3		0.29	4590		4.0	284		0.11
E-2	J1JCT0	5/31/11	15.0	X	0.19	0.917		0.154	13800		3.3	4.9		0.24	4700		3.3	230		0.088
E-3	J1JCT1	5/31/11	17.4	X	0.22	0.154	U	0.154	17100		3.8	4.2		0.27	4540		3.7	331		0.10
E-4	J1JCT2	5/31/11	13.6	X	0.20	0.155	U	0.155	13700		3.5	2.6		0.25	4030		3.4	225		0.093
E-5	J1JCT3	5/31/11	21.9	X	0.19	0.154	U	0.154	12800		3.3	6.5		0.24	3850		3.2	203		0.087
E-7	J1JCT5	5/31/11	14.2	X	0.21	0.154	U	0.154	13100		3.7	8.1		0.26	3760		3.6	197		0.096
E-8	J1JCT6	5/31/11	13.1	X	0.20	0.154	U	0.154	15600		3.5	4.9		0.25	4810		3.4	266		0.093
E-9	J1JCT7	5/31/11	14.5	X	0.21	0.153	U	0.153	14800		3.6	4.5		0.26	4020		3.6	201		0.096
E-10	J1JCT8	5/31/11	10.7	X	0.21	0.155	U	0.155	14700		3.7	11.6		0.26	3820		3.6	251		0.097
E-11	J1JCT9	5/31/11	16.1	X	0.21	0.154	U	0.154	14100		3.6	3.2		0.26	4210		3.6	212		0.096
E-12	J1JCV0	5/31/11	15.9	X	0.22	0.154	U	0.154	15200		3.8	2.8		0.27	4230		3.7	236		0.10
F-2	J1JCV3	5/26/11	12.5		0.21	0.265		0.154	19800		3.8	5.4		0.27	4600		3.7	330		0.099
Duplicate of J1JCV3	J1JCW4	5/26/11	13.0		0.22	0.154	U	0.154	19600		3.8	5.2		0.27	4710		3.7	329		0.10
F-1	J1JCV2	5/26/11	14.0		0.21	0.154	U	0.154	19400		3.7	6.7		0.27	4900		3.6	315		0.098
F-3	J1JCV4	5/26/11	14.1		0.21	0.154	U	0.154	19500		3.6	5.5		0.26	5100		3.6	309		0.096
F-4	J1JCV5	5/26/11	11.6		0.21	0.223		0.155	19900		3.6	5.4		0.26	4350		3.5	342		0.096
F-5	J1JCV6	5/26/11	13.8		0.20	0.155	U	0.155	20400		3.4	5.6		0.25	4930		3.4	326		0.091
F-6	J1JCV7	5/26/11	13.2		0.22	0.221		0.155	21000		3.9	5.7		0.28	4920		3.8	359		0.10
F-7	J1JCV8	5/26/11	13.4		0.20	0.154	U	0.154	21200		3.5	5.8		0.25	4680		3.4	351		0.092
F-8	J1JCV9	5/26/11	15.0		0.21	0.154	U	0.154	19400		3.7	5.3		0.26	4850		3.6	305		0.098
F-9	J1JCW0	5/26/11	14.1		0.20	0.154	U	0.154	19100		3.5	5.5		0.25	4890		3.4	297		0.092
F-10	J1JCW1	5/26/11	17.3		0.22	0.154	U	0.154	19900		3.9	5.3		0.27	5550		3.8	291		0.10
F-11	J1JCW2	5/26/11	15.1		0.20	0.155	U	0.155	17200		3.5	3.9		0.25	4500		3.4	250		0.093
F-12	J1JCW3	5/26/11	14.9		0.19	0.154	U	0.154	21100		3.4	6.1		0.24	5270		3.3	342		0.089
Equipment blank	J1B853	6/30/10	1.67	U	1.67	0.20	U	0.20	192		16.7	0.269	B	0.83	23.2		4.17	3.36		0.83
Equipment blank	J1JCW5	5/26/11	0.11	BX	0.09	0.20	U	0.20	359		3.6	0.25	U	0.25	26.7		3.5	5.5		0.094

Attachment	1	Sheet No.	6 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A3	J1B856	6/30/10	0.027	U	0.027	0.338	B	0.835	10.4		2.09	1720		83.5	0.251	U	0.251
Duplicate of J1B856	J1B866	6/30/10	0.028	U	0.028	0.283	B	0.784	10.7		1.96	1790		78.4	0.235	U	0.235
A1	J1B854	6/30/10	0.0090	B	0.020	0.346	B	0.874	9.5		2.18	1500		87.4	0.262	U	0.262
A2	J1B855	6/30/10	0.029	U	0.029	0.422	B	0.844	12.6		2.11	2150		84.4	0.253	U	0.253
A4	J1B857	6/30/10	0.025	U	0.025	0.459	B	0.820	10.4		2.05	1980		82.0	0.246	U	0.246
A5	J1B858	6/30/10	0.026	U	0.026	0.354	B	0.870	10		2.18	2050		87.0	0.261	U	0.261
A6	J1B859	6/30/10	0.025	U	0.025	0.337	B	0.855	10.6		2.14	1850		85.5	0.256	U	0.256
A7	J1B860	6/30/10	0.023	U	0.023	0.421	B	0.845	11		2.11	1630		84.5	0.254	U	0.254
A8	J1B861	6/30/10	0.025	U	0.025	0.368	B	0.839	10.5		2.1	1620		83.9	0.252	U	0.252
A9	J1B862	6/30/10	0.025	U	0.025	0.381	B	0.869	10.4		1.67	1920		66.9	0.201	U	0.201
A-9[a]	J1JVX2	6/16/11	0.020	M	0.0053	0.28	B	0.15	10.7		0.11	1880		37.9	0.80	U	0.80
A10	J1B863	6/30/10	0.025	U	0.025	0.315	B	0.949	11.7		2.37	2540		94.9	0.285	U	0.285
A11	J1B864	6/30/10	0.020	B	0.030	0.369	B	0.678	9.32		1.7	1290		67.8	0.204	U	0.204
A12	J1B865	6/30/10	0.027	U	0.027	0.369	B	0.822	8.99		2.05	1810		82.2	0.247	U	0.247
B8	J1B887	6/29/10	0.028	U	0.028	0.217	B	0.744	11.1		1.86	2290		74.4	0.223	U	0.223
Duplicate of J1B892	J1B892	6/29/10	0.026	U	0.026	0.233	B	0.762	11.1		1.91	2370		76.2	0.229	U	0.229
B1	J1B880	6/29/10	0.025	U	0.025	0.232	B	0.836	10.5		2.09	1750		83.6	0.251	U	0.251
B2	J1B881	6/29/10	0.025	U	0.025	0.269	B	0.801	11.1		2	1820		80.1	0.24	U	0.24
B3	J1B882	6/29/10	0.025	U	0.025	0.216	B	0.711	12.1		1.78	2040		71.1	0.213	U	0.213
B4	J1B883	6/29/10	0.025	U	0.025	0.224	B	0.904	11.7		2.26	2020		90.4	0.271	U	0.271
B13[b]	J1B884	6/29/10	0.027	U	0.027	0.33	B	1.01	11.8		2.53	2210		101	0.304	U	0.304
B6	J1B885	6/29/10	0.028	U	0.028	0.23	B	0.95	10.6		2.37	1690		95	0.285	U	0.285
B7	J1B886	6/29/10	0.009	B	0.020	0.233	B	0.752	12.9		1.88	1670		75.2	0.226	U	0.226
B9	J1B888	6/29/10	0.023	U	0.023	0.228	B	0.814	11.1		2.04	2290		81.4	0.244	U	0.244
B10	J1B889	6/29/10	0.023	U	0.023	0.207	B	0.877	10.4		2.19	1780		87.7	0.263	U	0.263
B11	J1B890	6/29/10	0.026	U	0.026	0.22	B	0.801	11		2	2040		80.1	0.24	U	0.24
B12	J1B891	6/29/10	0.082		0.030	0.369	B	0.848	14		2.12	2170		84.8	0.254	U	0.254
C8	J1B8B0	6/29/10	0.027	U	0.027	0.301	B	0.678	9.96	J	1.7	1610		67.8	0.203	U	0.203
Duplicate of J1B8B0	J1B8B5	6/29/10	0.024	U	0.024	0.286	B	0.688	10.0	J	1.72	1620		68.8	0.206	U	0.206
C1	J1B893	6/17/10	0.030	B	0.030	0.434	B	0.711	10		1.78	1770		71.1	0.213	U	0.213
C2	J1B894	6/17/10	0.026	U	0.026	0.367	B	0.751	10.8		1.88	1840		75.1	0.225	U	0.225
C3	J1B895	6/17/10	0.031	U	0.031	0.298	B	0.644	12.4		1.61	1940		64.4	0.193	U	0.193
C4	J1B896	6/17/10	0.026	U	0.026	0.325	B	0.823	14.3		2.06	1770		82.3	0.247	U	0.247
C5	J1B897	6/17/10	0.026	U	0.026	0.301	B	0.894	12.6		2.24	2210		89.4	0.268	U	0.268
C6	J1B8B1	6/17/10	0.032	U	0.032	0.345	B	0.837	11.5		2.09	2010		83.7	0.251	U	0.251
C7	J1B899	6/29/10	0.030	U	0.030	0.354	B	0.774	17.6	J	1.93	837		77.4	0.232	U	0.232
C9	J1B898	6/29/10	0.028	U	0.028	0.331	B	0.762	11.2	J	1.91	1740		76.2	0.229	U	0.229
C10	J1B8B2	6/29/10	0.015	B	0.020	0.299	B	0.657	9.53	J	1.64	1370		65.7	0.197	U	0.197
C11	J1B8B3	6/29/10	0.023	U	0.023	0.249	B	0.753	9.64	J	1.88	1570		75.3	0.226	U	0.226
C12	J1B8B4	6/29/10	0.0080	B	0.020	0.237	B	0.765	11.0	J	1.91	1760		76.5	0.229	U	0.229

Attachment	1	Sheet No.	7 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
D5	J1B8C0	6/29/10	0.029	U	0.029	0.352	B	0.793	13.0	J	1.98	2220		79.3	0.238	U	0.238
Duplicate of J1B8C0	J1B8C8	6/29/10	0.032	U	0.032	0.302	B	0.749	13.3	J	1.87	2280		74.9	0.225	U	0.225
D1	J1B8B6	6/29/10	0.027	U	0.027	0.288	B	0.743	11.8	J	1.86	2300		74.3	0.223	U	0.223
D2	J1B8B7	6/29/10	1.07		0.030	0.315	B	0.990	9.91	J	2.48	1170		99.0	0.297	U	0.297
D3	J1B8B8	6/29/10	0.026	U	0.026	0.242	B	0.677	11.2	J	1.69	1620		67.7	0.203	U	0.203
D4	J1B8B9	6/29/10	0.020	B	0.030	0.524	B	0.881	11.5	J	2.20	1420		88.1	0.264	U	0.264
D6	J1B8C1	6/29/10	0.035		0.030	0.389	B	0.798	11.1	J	2.00	1120		79.8	0.24	U	0.24
D7	J1B8C2	6/29/10	0.024	U	0.024	0.327	B	0.680	10.0	J	1.70	1650		68.0	0.204	U	0.204
D8	J1B8C3	6/29/10	0.010	B	0.030	0.427	B	0.680	10.5	J	1.70	1090		68.0	0.204	U	0.204
D9	J1B8C4	6/29/10	0.030	U	0.030	0.329	B	0.806	11.2	J	2.01	2060		80.6	0.242	U	0.242
D10	J1B8C5	6/29/10	0.048		0.030	0.481	B	0.822	10.4	J	2.05	1800		82.2	0.247	U	0.247
D11	J1B8C6	6/29/10	0.008	B	0.020	0.459	B	0.635	12.3	J	1.59	1570		63.5	0.19	U	0.19
D12	J1B8C7	6/29/10	0.029	U	0.029	0.302	B	0.757	10.5	J	1.89	1330		75.7	0.227	U	0.227
E-6	J1JCT4	5/31/11	0.0076	B	0.0053	0.22	U	0.22	11.4		0.11	2720		35.3	0.74	U	0.74
Duplicate of J1JCT4	J1JCV1	5/31/11	0.074		0.0057	0.25	U	0.25	11.7		0.12	2790		39.8	0.83	U	0.83
E-1	J1JCR9	5/31/11	0.0057	U	0.0057	0.49	B	0.28	10.6	M	0.13	828		44.7	0.94	U	0.94
E-2	J1JCT0	5/31/11	0.0054	B	0.0051	0.23	U	0.23	13.6		0.11	789		36.0	0.76	U	0.76
E-3	J1JCT1	5/31/11	0.0063	B	0.0055	0.26	U	0.26	11.9		0.12	1240		41.0	0.86	U	0.86
E-4	J1JCT2	5/31/11	0.0072	B	0.0056	0.24	U	0.24	9.1		0.11	635		38.0	0.80	U	0.80
E-5	J1JCT3	5/31/11	0.0055	U	0.0055	0.23	U	0.23	9.9		0.11	716		35.7	0.75	U	0.75
E-7	J1JCT5	5/31/11	0.011	B	0.0049	0.25	U	0.25	9.4		0.12	745		39.5	0.83	U	0.83
E-8	J1JCT6	5/31/11	0.0049	U	0.0049	0.24	U	0.24	12.3		0.11	1610		38.1	0.80	U	0.80
E-9	J1JCT7	5/31/11	0.0054	U	0.0054	0.25	U	0.25	10.2		0.12	805		39.4	0.83	U	0.83
E-10	J1JCT8	5/31/11	0.0054	U	0.0054	0.25	U	0.25	10.6		0.12	1630		39.7	0.83	U	0.83
E-11	J1JCT9	5/31/11	0.0062	B	0.0055	0.25	U	0.25	11		0.12	938		39.4	0.83	U	0.83
E-12	J1JCV0	5/31/11	0.0056	U	0.0056	0.26	U	0.26	9.8		0.12	710		41.3	0.87	U	0.87
F-2	J1JCV3	5/26/11	0.0053	U	0.0053	0.26	U	0.26	11.9		0.12	2040		40.6	0.85	U	0.85
Duplicate of J1JCV3	J1JCW4	5/26/11	0.0052	U	0.0052	0.26	U	0.26	12.4		0.12	2070		40.9	0.86	U	0.86
F-1	J1JCV2	5/26/11	0.0073	B	0.0057	0.26	U	0.26	12.8		0.12	1660		40.2	0.84	U	0.84
F-3	J1JCV4	5/26/11	0.0057	U	0.0057	0.25	U	0.25	13.9		0.12	1690		39.4	0.83	U	0.83
F-4	J1JCV5	5/26/11	0.0054	U	0.0054	0.25	U	0.25	11.4		0.12	2120		39.3	0.82	U	0.82
F-5	J1JCV6	5/26/11	0.0053	U	0.0053	0.24	U	0.24	12.6		0.11	1900		37.2	0.78	U	0.78
F-6	J1JCV7	5/26/11	0.0054	U	0.0054	0.27	U	0.27	14.3		0.13	2350		42.1	0.88	U	0.88
F-7	J1JCV8	5/26/11	0.0053	U	0.0053	0.24	U	0.24	12.4		0.11	2160		37.9	0.80	U	0.80
F-8	J1JCV9	5/26/11	0.0057	U	0.0057	0.25	U	0.25	12.3		0.12	1480		40.2	0.84	U	0.84
F-9	J1JCW0	5/26/11	0.0067	B	0.0057	0.24	U	0.24	12.4		0.11	1390		37.6	0.79	U	0.79
F-10	J1JCW1	5/26/11	0.0094	B	0.0050	0.26	U	0.26	14.9		0.13	1540		41.7	0.87	U	0.87
F-11	J1JCW2	5/26/11	0.0052	U	0.0052	0.24	U	0.24	10.6		0.11	1090		38.1	0.80	U	0.80
F-12	J1JCW3	5/26/11	0.0053	U	0.0053	0.23	U	0.23	13.2		0.11	1930		36.7	0.77	U	0.77
Equipment blank	J1B853	6/30/10	0.029	U	0.030	0.834	U	0.83	2.09	U	2.09	33	B	83.4	0.25	U	0.25
Equipment blank	J1JCW5	5/26/11	0.0054	U	0.0054	0.25	U	0.25	0.16	B	0.12	48.6	B	38.7	0.81	U	0.81

Attachment	1	Sheet No.	8 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc			TPH - diesel range		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
A3	J1B856	6/30/10	647		5.01	0.835	U	0.835	197		41.8	36.9		0.835	43.9		2.51	3380	U	3380
Duplicate of J1B856	J1B866	6/30/10	1090		4.71	0.784	U	0.784	215		39.2	38.6		0.784	44.1		2.35	3340	U	3340
A1	J1B854	6/30/10	1150		5.24	0.874	U	0.874	244		43.7	50.0		0.874	40.5		2.62	3330	U	3330
A2	J1B855	6/30/10	1210		5.07	0.844	U	0.844	228		42.2	45.6		0.844	43		2.53	3280	U	3280
A4	J1B857	6/30/10	1110		4.92	0.82	U	0.820	226		41.0	43.4		0.820	50.7		2.46	3320	U	3320
A5	J1B858	6/30/10	537		5.22	0.87	U	0.870	199		43.5	42.8		0.870	43.8		2.61	3380	U	3380
A6	J1B859	6/30/10	618		5.13	0.855	U	0.855	193		42.7	41.6		0.855	50.1		2.56	3210	U	3210
A7	J1B860	6/30/10	1190		5.07	0.845	U	0.845	240		42.3	41.1		0.845	48.7		2.54	3300	U	3300
A8	J1B861	6/30/10	1040		5.04	0.839	U	0.839	206		42.0	41.3		0.839	42		2.52	3290	U	3290
[redacted]																				
A-9[a]	J1JVX2	6/16/11	254	N	5.2	0.15	U	0.15	230		54.6	38.1		0.15	49.3	X	0.37	8400	N	680
A10	J1B863	6/30/10	1510		5.69	0.949	U	0.949	201		47.4	44.8		0.949	58.5		2.85	3460	U	3460
A11	J1B864	6/30/10	494		4.07	0.678	U	0.678	313		33.9	50.7		0.678	43.2		2.04	3210	U	3210
A12	J1B865	6/30/10	914		4.93	0.822	U	0.822	377		41.1	54.8		0.822	47.4		2.47	3260	U	3260
B8	J1B887	6/29/10	1450		4.47	0.744	U	0.744	217		37.2	44.4		0.744	41.9		2.23	3430	U	3430
Duplicate of J1B892	J1B892	6/29/10	1360		4.57	0.762	U	0.762	231		38.1	44.9		0.762	43.5		2.29	3400	U	3400
B1	J1B880	6/29/10	1450		5.02	0.836	U	0.836	208		41.8	46.5		0.836	45.8		2.51	3310	U	3310
B2	J1B881	6/29/10	1450		4.81	0.801	U	0.801	206		40.0	42.8		0.801	38.6		2.4	3420	U	3420
B3	J1B882	6/29/10	1360		4.27	0.711	U	0.711	207		35.6	44.9		0.711	37.7		2.13	3300	U	3300
B4	J1B883	6/29/10	1620		5.42	0.904	U	0.904	215		45.2	44.9		0.904	41.1		2.71	3330	U	3330
B13[b]	J1B884	6/29/10	1700		6.07	1.01	U	1.01	248		50.6	47.8		1.01	42.4		3.04	3410	U	3410
B6	J1B885	6/29/10	1610		5.7	0.95	U	0.95	322		47.5	46.8		0.95	42.2		2.85	3250	U	3250
B7	J1B886	6/29/10	1400		4.51	0.752	U	0.752	259		37.6	46.9		0.752	39.3		2.26	3330	U	3330
B9	J1B888	6/29/10	1480		4.89	0.814	U	0.814	221		40.7	44		0.814	41.8		2.44	3210	U	3210
B10	J1B889	6/29/10	1430		5.26	0.877	U	0.877	219		43.9	42.4		0.877	39.2		2.63	3330	U	3330
B11	J1B890	6/29/10	1440		4.81	0.801	U	0.801	226		40.1	44.5		0.801	44.5		2.4	3320	U	3320
B12	J1B891	6/29/10	1490		5.09	0.848	U	0.848	274		42.4	50.2		0.848	47		2.54	3510	U	3510
C8	J1B8B0	6/29/10	1080	J	4.07	0.678	U	0.678	233		33.9	46.2	J	0.678	38.5		2.03	3240	U	3240
Duplicate of J1B8B0	J1B8B5	6/29/10	1100	J	4.13	0.688	U	0.688	244		34.4	46.6	J	0.688	40.2		2.06	3310	U	3310
C1	J1B893	6/17/10	475		4.27	0.711	U	0.711	229		35.6	46.4		0.711	44.2		2.13	9300		3410
C2	J1B894	6/17/10	952		4.51	0.751	U	0.751	225		37.5	40.6		0.751	43.4		2.25	8630		3390
C3	J1B895	6/17/10	535		3.86	0.644	U	0.644	206		32.2	41.3		0.644	40.1		1.93	3390	U	3390
C4	J1B896	6/17/10	774		4.94	0.823	U	0.823	240		41.1	49.6		0.823	44.9		2.47	3370	U	3370
C5	J1B897	6/17/10	599		5.36	0.894	U	0.894	204		44.7	43.3		0.894	44.6		2.68	3500	U	3500
C6	J1B8B1	6/17/10	944		5.02	0.837	U	0.837	224		41.9	47.7		0.837	47.3		2.51	3570	U	3570
C7	J1B899	6/29/10	1000	J	4.64	0.774	U	0.774	267		38.7	44.3	J	0.774	39.4		2.32	3340	U	3340
C9	J1B898	6/29/10	1410	J	4.57	0.762	U	0.762	260		38.1	50.1	J	0.762	41.9		2.29	3330	U	3330
C10	J1B8B2	6/29/10	1060	J	3.94	0.657	U	0.657	244		32.9	38.1	J	0.657	44.8		1.97	5320		3320
C11	J1B8B3	6/29/10	1170	J	4.52	0.753	U	0.753	201		37.6	36.4	J	0.753	35.6		2.26	3340	U	3340
C12	J1B8B4	6/29/10	1230	J	4.59	0.765	U	0.765	204		38.2	42.1	J	0.765	38.8		2.29	7630		3310

Attachment	1	Sheet No.	9 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc			TPH - diesel range			
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	
D5	J1B8C0	6/29/10	1490	J	4.76	0.793	U	0.793	267		39.6	47.8	J	0.793	42.5		2.38	3320	U	3320	
Duplicate of J1B8C0	J1B8C8	6/29/10	1410	J	4.49	0.749	U	0.749	277		37.4	49.0	J	0.749	43.9		2.25	3580	U	3580	
D1	J1B8B6	6/29/10	1420	J	4.46	0.743	U	0.743	220		37.1	41.7	J	0.743	42.6		2.23	3300	U	3300	
D2	J1B8B7	6/29/10	1220	J	5.94	0.990	U	0.990	304		49.5	39.4	J	0.990	38.7		2.97	8970		3350	
D3	J1B8B8	6/29/10	1190	J	4.06	0.677	U	0.677	249		33.8	39.8	J	0.677	37		2.03	3340	U	3340	
D4	J1B8B9	6/29/10	1450	J	5.28	0.881	U	0.881	284		44.0	58.4	J	0.881	40.7		2.64	3470	U	3470	
D6	J1B8C1	6/29/10	1150	J	4.79	0.798	U	0.798	304		39.9	48.4	J	0.798	36.9		2.40	1060	J	3270	
D7	J1B8C2	6/29/10	1100	J	4.08	0.680	U	0.680	254		34.0	52.5	J	0.680	39.5		2.04	3370	U	3370	
D8	J1B8C3	6/29/10	1010	J	4.08	0.680	U	0.680	240		34.0	58.2	J	0.680	36.3		2.04	925	J	3320	
D9	J1B8C4	6/29/10	1430	J	4.84	0.806	U	0.806	228		40.3	43.0	J	0.806	39.9		2.42	3400	U	3400	
D10	J1B8C5	6/29/10	1300	J	4.93	0.822	U	0.822	330		41.1	49.4	J	0.822	42.8		2.47	5210		3210	
D11	J1B8C6	6/29/10	1110	J	3.81	0.635	U	0.635	292		31.7	45.7	J	0.635	38.5		1.90	28800		3270	
D12	J1B8C7	6/29/10	1270	J	4.54	0.757	U	0.757	243		37.9	50.2	J	0.757	36.5		2.27	3210	U	3210	
E-6	J1JCT4	5/31/11	99.9		4.9	0.14	U	0.14	217		50.7	35.9		0.081	39.6	X	0.34	690	U	690	
Duplicate of J1JCT4	J1JCV1	5/31/11	215		5.5	0.16	U	0.16	214		57.2	38.0		0.091	40.5	X	0.39	660	U	660	
E-1	J1JCR9	5/31/11	202	N	6.2	0.17	U	0.17	226		64.4	46.6		0.10	35.1	X	0.43	770	U	770	
E-2	J1JCT0	5/31/11	142		5.0	0.14	U	0.14	217		51.9	38.1		0.083	34	X	0.35	160000		670	1
E-3	J1JCT1	5/31/11	279		5.7	0.16	U	0.16	278		58.9	41.8		0.094	37.5	X	0.40	680	U	680	
E-4	J1JCT2	5/31/11	116		5.2	0.15	U	0.15	200		54.7	37.8		0.087	29.8	X	0.37	3700	J	670	
E-5	J1JCT3	5/31/11	138		4.9	0.14	U	0.14	185		51.4	36.0		0.082	30.9	X	0.35	670	U	670	
E-7	J1JCT5	5/31/11	125		5.5	0.15	U	0.15	175		56.9	36.3		0.091	31.8	X	0.38	680	U	680	
E-8	J1JCT6	5/31/11	241		5.3	0.15	U	0.15	214		54.9	35.6		0.087	39	X	0.37	680	U	680	
E-9	J1JCT7	5/31/11	184		5.4	0.15	U	0.15	196		56.6	41.0		0.090	31.5	X	0.38	650	U	650	
E-10	J1JCT8	5/31/11	197		5.5	0.15	U	0.15	198		57.1	33.8		0.091	34.1	X	0.39	680	U	680	
E-11	J1JCT9	5/31/11	167		5.4	0.15	U	0.15	192		56.7	37.3		0.090	31.2	X	0.38	690	U	690	
E-12	J1JCV0	5/31/11	147		5.7	0.16	U	0.16	206		59.5	44.0		0.095	37	X	0.40	680	U	680	
F-2	J1JCV3	5/26/11	317		5.6	0.16	U	0.16	197		58.4	38.1		0.093	39.8		0.39	700	U	700	
Duplicate of J1JCV3	J1JCW4	5/26/11	289		5.6	0.16	U	0.16	195		58.8	37.8		0.094	40.3		0.40	650	U	650	
F-1	J1JCV2	5/26/11	274	N	5.6	0.16	U	0.16	239		57.9	38.5		0.092	38.8		0.39	650	J	650	
F-3	J1JCV4	5/26/11	319		5.4	0.15	U	0.15	274		56.7	38.6		0.090	39		0.38	690	U	690	
F-4	J1JCV5	5/26/11	283		5.4	0.15	U	0.15	227		56.6	38.7		0.090	41.9		0.38	700	U	700	
F-5	J1JCV6	5/26/11	409		5.1	0.15	U	0.15	272		53.6	40.0		0.085	39.6		0.36	660	U	660	
F-6	J1JCV7	5/26/11	268		5.8	0.16	U	0.16	223		60.5	40.4		0.096	43.8		0.41	690	U	690	
F-7	J1JCV8	5/26/11	304		5.2	0.15	U	0.15	248		54.6	41.7		0.087	42		0.37	690	U	690	
F-8	J1JCV9	5/26/11	281		5.5	0.16	U	0.16	237		57.8	41.0		0.092	37.8		0.39	11000		680	
F-9	J1JCW0	5/26/11	250		5.2	0.15	U	0.15	306		54.1	40.1		0.086	37.6		0.37	4300		670	
F-10	J1JCW1	5/26/11	353		5.8	0.16	U	0.16	355		60.0	42.0		0.096	38.4		0.40	2800	J	660	
F-11	J1JCW2	5/26/11	281		5.3	0.15	U	0.15	259		54.8	40.1		0.087	33		0.37	24000		650	
F-12	J1JCW3	5/26/11	307		5.1	0.14	U	0.14	278		52.8	41.2		0.084	41.6		0.36	4600		680	
Equipment blank	J1B853	6/30/10	172		5.0	0.834	U	0.83	41.7	U	41.7	0.212	B	0.83	1.05	B	2.5	9470	U	9470	
Equipment blank	J1JCW5	5/26/11	102		5.3	0.15	U	0.15	55.7	U	55.7	0.38	B	0.089	1.4		0.38	3100	J	640	

Attachment	1	Sheet No.	10 of 45
Originator	J. D. Skoglie	Date	9/13/11
Checked	T. E. Queen	Date	9/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	1

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	TPH - motor oil (high boiling)			TPH - diesel range EXT			Percent Moisture	Percent Solids
			ug/kg	Q	PQL	ug/kg	Q	PQL		
A3	J1B856	6/30/10	21100		10100					98.1
Duplicate of J1B856	J1B866	6/30/10	31400		10000					98.1
A1	J1B854	6/30/10	8010	J	9980					98.7
A2	J1B855	6/30/10	24800		9850					98.7
A4	J1B857	6/30/10	54300		9960					100
A5	J1B858	6/30/10	12400		10100					97.4
A6	J1B859	6/30/10	26900		9620					99.1
A7	J1B860	6/30/10	70400		9900					97
A8	J1B861	6/30/10	21400		9870					99.3
A9	J1B862	6/30/10	79400		9900					99.6
A-9[a]	J1JVX2	6/16/11				24000	N	1000		
A10	J1B863	6/30/10	14100		10400					95.8
A11	J1B864	6/30/10	13500		9640					98.3
A12	J1B865	6/30/10	12400		9780					98.1
B8	J1B887	6/29/10	9720	J	10300					96
Duplicate of J1B892	J1B892	6/29/10	8470	J	10200					95.1
B1	J1B880	6/29/10	57000		9940					99.7
B2	J1B881	6/29/10	8480	J	10200					97.5
B3	J1B882	6/29/10	6540	J	9890					99
B4	J1B883	6/29/10	5880	J	10000					97.1
B13[b]	J1B884	6/29/10	10700		10200					96.9
B6	J1B885	6/29/10	8600	J	9760					99.3
B7	J1B886	6/29/10	4230	J	10000					99.2
B9	J1B888	6/29/10	13600		9630					97.4
B10	J1B889	6/29/10	13200		9990					100
B11	J1B890	6/29/10	5890	J	9970					97.5
B12	J1B891	6/29/10	26000		10500					93.6
C8	J1B8B0	6/29/10	9130	J	9710					99.6
Duplicate of J1B8B0	J1B8B5	6/29/10	11600	J	9920					99.5
C1	J1B893	6/17/10	36400		10200					93.7
C2	J1B894	6/17/10	29500		10200					97.9
C3	J1B895	6/17/10	10200	U	10200					98.3
C4	J1B896	6/17/10	10100	U	10100					98
C5	J1B897	6/17/10	13400		10500					94.8
C6	J1B8B1	6/17/10	4060	J	10700					91.9
C7	J1B899	6/29/10	10000	UJ	10000					99.4
C9	J1B898	6/29/10	17200	J	9990					97.9
C10	J1B8B2	6/29/10	18500	J	9960					98.8
C11	J1B8B3	6/29/10	5430	J	10000					99.1
C12	J1B8B4	6/29/10	16000	J	9920					99.1

Attachment	1	Sheet	11 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Metals)

Sample location	HEIS Number	Sample Date	TPH - motor oil (high boiling)			TPH - diesel range EXT			% Moisture	% Solids
			ug/kg	Q	PQL	ug/kg	Q	PQL		
D5	J1B8C0	6/29/10	9950	UJ	9950					98.5
Duplicate of J1B8C0	J1B8C8	6/29/10	10700	UJ	10700					92.8
D1	J1B8B6	6/29/10	9900	UJ	9900					99
D2	J1B8B7	6/29/10	29300	J	10000					97.1
D3	J1B8B8	6/29/10	6970	J	10000					99.8
D4	J1B8B9	6/29/10	4970	J	10400					93.1
D6	J1B8C1	6/29/10	3590	J	9800					99.4
D7	J1B8C2	6/29/10	4800	J	10100					98
D8	J1B8C3	6/29/10	6810	J	9950					99.3
D9	J1B8C4	6/29/10	10200	UJ	10200					95.5
D10	J1B8C5	6/29/10	25100	J	9630					99.7
D11	J1B8C6	6/29/10	66700	J	9810					98.5
D12	J1B8C7	6/29/10	6450	J	9650					98.5
E-6	J1JCT4	5/31/11	1600	J	1000				3.1	
Duplicate of J1JCT4	J1JCV1	5/31/11	980	U	980				2.7	
E-1	J1JCR9	5/31/11	1100	U	1100				12.7	
E-2	J1JCT0	5/31/11	380000		990				1.1	
E-3	J1JCT1	5/31/11	1000	U	1000				1.9	
E-4	J1JCT2	5/31/11	12000		980				1	
E-5	J1JCT3	5/31/11	2700	J	990				0.97	
E-7	J1JCT5	5/31/11	1900	J	1000				1.2	
E-8	J1JCT6	5/31/11	1000	U	1000				1.3	
E-9	J1JCT7	5/31/11	960	U	960				0.78	
E-10	J1JCT8	5/31/11	1900	J	1000				2.5	
E-11	J1JCT9	5/31/11	1000	J	1000				2.7	
E-12	J1JCV0	5/31/11	1000	U	1000				0.76	
F-2	J1JCV3	5/26/11	1100	J	1000				4.7	
Duplicate of J1JCV3	J1JCW4	5/26/11	1200	J	960				4.5	
F-1	J1JCV2	5/26/11	1400	J	950				3.9	
F-3	J1JCV4	5/26/11	1200	J	1000				4.5	
F-4	J1JCV5	5/26/11	1100	J	1000				6.1	
F-5	J1JCV6	5/26/11	1400	J	980				4.2	
F-6	J1JCV7	5/26/11	1000	J	1000				4.5	
F-7	J1JCV8	5/26/11	1000	U	1000				3.4	
F-8	J1JCV9	5/26/11	26000		1000				3.8	
F-9	J1JCW0	5/26/11	7500		990				3.5	
F-10	J1JCW1	5/26/11	7600		970				3.6	
F-11	J1JCW2	5/26/11	25000		960				3	
F-12	J1JCW3	5/26/11	8400		1000				3.6	
Equipment blank	J1B853	6/30/10	99.9						3160	
Equipment blank	J1JCW5	5/26/11	3300	J	940				0.1	

Attachment	1	Sheet	12 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B856			J1B866			J1B854			J1B855			J1B857			J1B858			J1B859		
		A3			Duplicate of J1B856			A1			A2			A4			A5			A6		
		6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.38	U	3.38	3.34	U	3.34	1.81	J	3.32	3.28	U	3.28	3.32	U	3.32	0.844	J	3.37	3.37		3.20
Acenaphthylene	PAH	3.38	U	3.38	3.34	U	3.34	3.32	U	3.32	3.28	U	3.28	3.65		3.32	2.53	J	3.37	3.20	U	3.20
Anthracene	PAH	4.22		3.38	3.51		3.34	3.32	U	3.32	3.28	U	3.28	1.33	J	3.32	1.18	J	3.37	5.93		3.20
Benzo(a)anthracene	PAH	32.7		3.38	32.4		3.34	3.04	J	3.32	4.51		3.28	23.9		3.32	15.3		3.37	51.4		3.20
Benzo(a)pyrene	PAH	47.1		3.38	75.7		3.34	6.65		3.32	8.07		3.28	51.5		3.32	55		3.37	88.0		3.20
Benzo(b)fluoranthene	PAH	30.2		3.38	43.8		3.34	5.79		3.32	6.02		3.28	34.4		3.32	40.3		3.37	60.0		3.20
Benzo(ghi)perylene	PAH	26.6		3.38	44.3		3.34	4.84		3.32	5.76		3.28	39.7		3.32	51.9		3.37	51.0		3.20
Benzo(k)fluoranthene	PAH	14.9		3.38	21.0		3.34	2.56	J	3.32	2.84	J	3.28	15.1		3.32	16.5		3.37	29.9		3.20
Chrysene	PAH	31.9		3.38	32.0		3.34	1.96	J	3.32	4.04		3.28	18.1		3.32	12.8		3.37	46.3		3.20
Dibenz[a,h]anthracene	PAH	5.19		3.38	7.67		3.34	3.32	U	3.32	1.07	J	3.28	6.87		3.32	7.13		3.37	9.75		3.20
Fluoranthene	PAH	99.3		3.38	114		3.34	3.32	U	3.32	3.28	U	3.28	65.7		3.32	40.1		3.37	179		3.20
Fluorene	PAH	2.87	J	3.38	2.51	J	3.34	3.32	U	3.32	3.28	U	3.28	1.49	J	3.32	3.37	U	3.37	2.73	J	3.20
Indeno(1,2,3-cd)pyrene	PAH	16.9		3.38	46.4		3.34	2.93	J	3.32	5.17		3.28	45.9		3.32	48.1		3.37	56.4		3.20
Naphthalene	PAH	3.38	U	3.38	3.34	U	3.34	3.32	U	3.32	3.28	U	3.28	5.48		3.32	3.55		3.37	3.2	U	3.20
Phenanthrene	PAH	50.0		3.38	34.8		3.34	3.16	J	3.32	2.79	J	3.28	15.6		3.32	12		3.37	50.7		3.20
Pyrene	PAH	96.4		3.38	99.2		3.34	8.01		3.32	9.80		3.28	66		3.32	40.5		3.37	184		3.20
Aldrin	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Alpha-BHC	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
alpha-Chlordane	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
beta-BHC	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Delta-BHC	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
4,4'-DDD	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
4,4'-DDE	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
4,4'-DDT	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Dieldrin	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endosulfan I	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	JD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endosulfan II	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endosulfan sulfate	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endrin	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endrin aldehyde	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Endrin ketone	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Gamma-BHC (Lindane)	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
gamma-Chlordane	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Heptachlor	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Heptachlor epoxide	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Methoxychlor	PEST	1.26	UD	1.26	1.31	UD	1.31	1.34	UD	1.34	1.35	UD	1.35	1.29	UD	1.29	1.27	UD	1.27	1.32	UD	1.32
Toxaphene	PEST	18.9	UD	18.9	19.7	UD	19.7	20.1	UD	20.1	20.2	UD	20.2	19.4	UD	19.4	19.1	UD	19.1	19.9	UD	19.9

Attachment	1	Sheet No.	13 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B860			J1B861			J1B862			J1JVX2			J1B863			J1B864			J1B865			J1B887			J1B892		
		A7			A8			A9			A9*			A10			A11			A12			B8			Duplicate of J1B887		
		6/30/10			6/30/10			6/30/10			6/16/11			6/30/10			6/30/10			6/30/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	2.81	J	3.3	3.29	U	3.29	13.2		3.3	9.2	U	9.2	10.9		3.46	3.21	U	3.21	3.26	U	3.26	1.38	J	3.44	3.38	U	3.38
Acenaphthylene	PAH	3.3	U	3.3	3.29	U	3.29	3.3	U	3.3	8.3	U	8.3	3.46	U	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Anthracene	PAH	3.63		3.3	2.3	J	3.29	2.64	J	3.3	2.8	U	2.8	1.21	J	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Benzo(a)anthracene	PAH	39.0		3.3	28.2		3.29	35.4		3.3	31	X	2.9	26.7		3.46	9.00		3.21	6.2		3.26	10.9		3.44	4.06		3.38
Benzo(a)pyrene	PAH	63.9		3.3	43.8		3.29	60.8		3.3	58		5.9	48.8		3.46	17.0		3.21	10.7		3.26	12.9		3.44	6.34		3.38
Benzo(b)fluoranthene	PAH	46.8		3.3	30.6		3.29	50.9		3.3	34		3.9	30.9		3.46	15.3		3.21	11.9		3.26	10.5		3.44	5.33		3.38
Benzo(ghi)perylene	PAH	37.7		3.3	26.3		3.29	38.5		3.3	38		6.6	28.0		3.46	13.9		3.21	7.81		3.26	9.60		3.44	8.01		3.38
Benzo(k)fluoranthene	PAH	21.9		3.3	15		3.29	23.2		3.3	25		3.6	15.1		3.46	6.44		3.21	4.19		3.26	4.85		3.44	2.30	J	3.38
Chrysene	PAH	37.2		3.3	26.2		3.29	29		3.3	36	J	4.5	28.3		3.46	8.53		3.21	4.12		3.26	9.67		3.44	3.94		3.38
Dibenz[a,h]anthracene	PAH	7.1		3.3	4.31		3.29	8.04		3.3	10	U	10	5.26		3.46	1.98	J	3.21	1.26	J	3.26	1.62	J	3.44	3.38	U	3.38
Fluoranthene	PAH	157		3.3	99.7		3.29	108		3.3	34	JX	12	59.0		3.46	25.4		3.21	17.1		3.26	35.6		3.44	10.1		3.38
Fluorene	PAH	1.82	J	3.3	1.2	J	3.29	1.16	J	3.3	4.9	U	4.9	3.46	U	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Indeno(1,2,3-cd)pyrene	PAH	40.4		3.3	25.5		3.29	40.4		3.3	38		11	30.5		3.46	5.93		3.21	5.36		3.26	10.1		3.44	4.21		3.38
Naphthalene	PAH	3.3	U	3.3	3.29	U	3.29	3.3	U	3.3	11	U	11	3.46	U	3.46	3.21	U	3.21	3.26	U	3.26	3.44	U	3.44	3.38	U	3.38
Phenanthrene	PAH	57.1		3.3	32.2		3.29	26.7		3.3	14	J	11	11.2		3.46	7.07		3.21	4.89		3.26	10.7		3.44	4.06		3.38
Pyrene	PAH	141		3.3	92.5		3.29	117		3.3	58		11	62.2		3.46	27.2		3.21	16.2		3.26	25.6		3.44	11.9		3.38
Aldrin	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.23	U	0.23	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Alpha-BHC	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.20	U	0.20	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
alpha-Chlordane	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.30	U	0.30	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
beta-BHC	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.62	U	0.62	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Delta-BHC	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.37	U	0.37	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
4,4'-DDD	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.51	U	0.51	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
4,4'-DDE	PEST	1.37	UD	1.37	1.32	UD	1.32	6.55	D	1.3	0.29	JX	0.22	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
4,4'-DDT	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.55	U	0.55	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Dieldrin	PEST	1.37	UD	1.37	1.32	UD	1.32	68.2	D	1.3	0.20	U	0.20	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endosulfan I	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.16	U	0.16	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endosulfan II	PEST	1.37	UD	1.37	1.32	UD	1.32	1.37	UD	1.3	0.27	U	0.27	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endosulfan sulfate	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.26	U	0.26	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endrin	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.29	U	0.29	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endrin aldehyde	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.16	U	0.16	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Endrin ketone	PEST	1.37	UD	1.37	1.32	UD	1.32	1.68	D	1.3	0.46	U	0.46	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.43	U	0.43	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
gamma-Chlordane	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.25	U	0.25	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Heptachlor	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.20	U	0.20	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Heptachlor epoxide	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.40	U	0.40	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Methoxychlor	PEST	1.37	UD	1.37	1.32	UD	1.32	1.3	UD	1.3	0.42	U	0.42	1.33	UD	1.33	1.28	UD	1.28	1.33	UD	1.33	1.36	UD	1.36	1.34	UD	1.34
Toxaphene	PEST	20.5	UD	20.5	19.9	UD	19.9	19.6	UD	19.6	15	U	15	20.0	UD	20.0	19.2	UD	19.2	20	UD	20	20.5	UD	20.5	20.2	UD	20.2

Attachment	1	Sheet No.	14 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B880			J1B881			J1B882			J1B883			J1B884			J1B885			J1B886			J1B888			J1B889		
		B1			B2			B3			B4			B13[b]			B6			B7			B9			B10		
		6/30/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	1.18	J	3.37	1.34	J	3.35	35.0		3.35	3.30	U	3.30	3.37	U	3.44	178		3.33
Acenaphthylene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	3.37	U	3.37	3.35	U	3.35	3.35	U	3.35	3.30	U	3.30	3.37	U	3.44	3.33	U	3.33
Anthracene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	3.37	U	3.37	1.26	J	3.35	1.01	J	3.35	3.30	U	3.30	3.37	U	3.44	2.83	J	3.33
Benzo(a)anthracene	PAH	2.97	J	3.32	5.74		3.41	3.52		3.36	13.1		3.37	15.9		3.35	19.2		3.35	3.30	U	3.30	2.78	J	3.44	14.8		3.33
Benzo(a)pyrene	PAH	3.83		3.32	6.17		3.41	2.86	J	3.36	19.7		3.37	24.1		3.35	24.5		3.35	3.30	U	3.30	4.64		3.44	18.7		3.33
Benzo(b)fluoranthene	PAH	5.05		3.32	5.01		3.41	2.27	J	3.36	12.1		3.37	17.8		3.35	20.4		3.35	3.30	U	3.30	3.00	J	3.44	15.30		3.33
Benzo(ghi)perylene	PAH	5.33		3.32	4.54		3.41	2.00	J	3.36	15.4		3.37	18.2		3.35	20.8		3.35	3.30	U	3.30	4.32		3.44	13.1		3.33
Benzo(k)fluoranthene	PAH	1.79	J	3.32	2.78	J	3.41	1.30	J	3.36	6.93		3.37	8.72		3.35	9.91		3.35	3.30	U	3.30	1.87	J	3.44	7.03		3.33
Chrysene	PAH	1.94	J	3.32	3.33	J	3.41	2.02	J	3.36	7.17		3.37	7.31		3.35	9.79		3.35	3.30	U	3.30	0.861	J	3.44	22.0		3.33
Dibenz[a,h]anthracene	PAH	1.06	J	3.32	3.41	U	3.41	3.36	U	3.36	2.34	J	3.37	3.30	J	3.35	3.79		3.35	3.30	U	3.30	3.37	U	3.44	1.97	J	3.33
Fluoranthene	PAH	9.63		3.32	8.03		3.41	3.70		3.36	19.6		3.37	30.1		3.35	89.7		3.35	3.30	U	3.30	6.08		3.44	37.0		3.33
Fluorene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	2.19	J	3.37	3.35	U	3.35	3.35	U	3.35	3.30	U	3.30	3.37	U	3.44	11.8		3.33
Indeno(1,2,3-cd)pyrene	PAH	2.04	J	3.32	5.13		3.41	1.16	J	3.36	15.1		3.37	20.7		3.35	23.3		3.35	3.30	U	3.30	3.21	J	3.44	9.68		3.33
Naphthalene	PAH	3.32	U	3.32	3.41	U	3.41	3.36	U	3.36	3.37	U	3.37	3.35	U	3.35	3.35	U	3.35	3.30	U	3.30	3.37	U	3.44	3.33	U	3.33
Phenanthrene	PAH	5.81		3.32	2.73	J	3.41	2.61	J	3.36	9.95		3.37	8.48		3.35	19.8		3.35	3.30	U	3.30	3.54		3.44	44.5		3.33
Pyrene	PAH	18.5		3.32	14.4		3.41	4.78		3.36	31.0		3.37	33.6		3.35	59.2		3.35	3.30	U	3.30	5.65		3.44	40.7		3.33
Aldrin	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Alpha-BHC	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
alpha-Chlordane	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
beta-BHC	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Delta-BHC	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
4,4'-DDD	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
4,4'-DDE	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
4,4'-DDT	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Dieldrin	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endosulfan I	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endosulfan II	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endosulfan sulfate	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endrin	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endrin aldehyde	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Endrin ketone	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
gamma-Chlordane	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Heptachlor	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Heptachlor epoxide	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Methoxychlor	PEST	1.34	UD	1.34	1.36	UD	1.36	1.34	UD	1.34	1.32	UD	1.32	1.37	UD	1.37	1.32	UD	1.32	1.33	UD	1.33	1.36	UD	1.36	1.32	UD	1.32
Toxaphene	PEST	20.1	UD	20.1	20.5	UD	20.5	20.2	UD	20.2	19.8	UD	19.8	20.6	UD	20.6	19.9	UD	19.9	20.0	UD	20.0	20.4	UD	20.4	19.8	UD	19.8

Attachment	1	Sheet No.	15 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B890			J1B891			J1B8B0			J1B8B5			J1B893			J1B894			J1B895			J1B896		
		B11			B12			C8			Duplicate of J1B8B0			C1			C2			C3			C4		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/17/10			6/17/10			6/17/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.41	U	3.41	15.8		3.51	68.2		3.29	3.30	U	3.30	12.5		3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Acenaphthylene	PAH	3.41	U	3.41	1.58	J	3.51	3.29	U	3.29	3.30	U	3.30	3.53	U	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Anthracene	PAH	3.41	U	3.41	1.76	J	3.51	3.54		3.29	3.30	U	3.30	1.59	J	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(a)anthracene	PAH	4.66		3.41	14.4		3.51	85.7	J	3.29	2.89	J	3.30	13.4		3.53	3.14	J	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(a)pyrene	PAH	8.51		3.41	17.2		3.51	50.8	J	3.29	4.16	J	3.30	11.1		3.53	2.48	J	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(b)fluoranthene	PAH	8.68		3.41	22.1		3.51	85.1	J	3.29	5.00	J	3.30	4.24		3.53	3.47		3.30	3.34	U	3.34	3.37	U	3.37
Benzo(ghi)perylene	PAH	12.6		3.41	9.70		3.51	26.6	J	3.29	3.27	J	3.30	90.1		3.53	1.82	J	3.30	3.34	U	3.34	3.37	U	3.37
Benzo(k)fluoranthene	PAH	3.0	J	3.41	7.17		3.51	26.2		3.29	1.87	J	3.30	6.89		3.53	1.65	J	3.30	3.34	U	3.34	3.37	U	3.37
Chrysene	PAH	1.9	J	3.41	16.2		3.51	105	J	3.29	3.29	J	3.30	19.4		3.53	22.7		3.30	3.34	U	3.34	3.37	U	3.37
Dibenz[a,h]anthracene	PAH	1.02	J	3.41	2.18	J	3.51	5.20		3.29	3.30	U	3.30	3.53	U	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Fluoranthene	PAH	11.4		3.41	43.4		3.51	261	J	3.29	8.59	J	3.30	11.0		3.53	14.7		3.30	3.34	U	3.34	3.37	U	3.37
Fluorene	PAH	3.41	U	3.41	3.51	U	3.51	3.29	U	3.29	3.30	U	3.30	3.53	U	3.53	4.30		3.30	3.34	U	3.34	3.37	U	3.37
Indeno(1,2,3-cd)pyrene	PAH	8.84		3.41	5.60		3.51	22.5	J	3.29	1.39	J	3.30	9.19		3.53	7.44		3.30	3.34	U	3.34	3.37	U	3.37
Naphthalene	PAH	3.41	U	3.41	3.51	U	3.51	3.29	U	3.29	3.30	U	3.30	3.53	U	3.53	3.30	U	3.30	3.34	U	3.34	3.37	U	3.37
Phenanthrene	PAH	4.69		3.41	16.2		3.51	50.3		3.29	4.46		3.30	26.5		3.53	9.26		3.30	3.34	U	3.34	3.37	U	3.37
Pyrene	PAH	10.7		3.41	40.5		3.51	181	J	3.29	5.95	J	3.30	35.5		3.53	6.12		3.30	3.34	U	3.34	3.37	U	3.37
Aldrin	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Alpha-BHC	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
alpha-Chlordane	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
beta-BHC	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Delta-BHC	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
4,4'-DDD	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
4,4'-DDE	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
4,4'-DDT	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Dieldrin	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endosulfan I	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endosulfan II	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endosulfan sulfate	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endrin	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endrin aldehyde	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Endrin ketone	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Gamma-BHC (Lindane)	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
gamma-Chlordane	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Heptachlor	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Heptachlor epoxide	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Methoxychlor	PEST	1.36	UD	1.36	1.42	UD	1.42	1.29	UD	1.29	1.34	UD	1.34	1.41	UD	1.41	1.3	UD	1.3	1.3	UD	1.3	1.36	UD	1.36
Toxaphene	PEST	20.4	UD	20.4	21.3	UD	21.3	19.3	UDJ	19.3	20.1	UDJ	20.1	21.2	UD	21.2	19.5	UD	19.5	19.5	UD	19.5	20.4	UD	20.4

Attachment	1	Sheet No.	16 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B897			J1B8B1			J1B899			J1B898			J1B8B2			J1B8B3			J1B8B4		
		C5			C6			C7			C9			C10			C11			C12		
		6/17/10			6/17/10			6/29/10			6/29/10			6/17/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	3.13	U	3.13	0.837	J	3.34	14.2		3.34	3.26	U	3.26
Acenaphthylene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	1.72	J	3.13	55.4		3.34	5.52		3.34	3.26	U	3.26
Anthracene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	2.67	J	3.13	3.34	U	3.34	3.34	U	3.34	3.26	U	3.26
Benzo(a)anthracene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	129	J	3.13	31.1	J	3.34	15.0	J	3.34	11.9	J	3.26
Benzo(a)pyrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	179	J	3.13	46.6	J	3.34	14.3	J	3.34	12.6	J	3.26
Benzo(b)fluoranthene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	190	J	3.13	47.3	J	3.34	10.7	J	3.34	11.7	J	3.26
Benzo(ghi)perylene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	116	J	3.13	34.3	J	3.34	10.6	J	3.34	8.93	J	3.26
Benzo(k)fluoranthene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	86.3		3.13	17.6		3.34	5.55		3.34	5.35		3.26
Chrysene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	99.9	J	3.13	30.3	J	3.34	8.18	J	3.34	8.66	J	3.26
Dibenz[a,h]anthracene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	18.6		3.13	7.14		3.34	1.61	J	3.34	1.47	J	3.26
Fluoranthene	PAH	2.19	J	2.19	11.0		3.59	3.16	UJ	3.16	149	J	3.13	100	J	3.34	29.4	J	3.34	24.5	J	3.26
Fluorene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	0.909	J	3.13	3.34	U	3.34	3.34	U	3.34	3.26	U	3.26
Indeno(1,2,3-cd)pyrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	121	J	3.13	35.3	J	3.34	14.7	J	3.34	10.9	J	3.26
Naphthalene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	3.13	U	3.13	3.34	U	3.34	3.34	U	3.34	3.26	U	3.26
Phenanthrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	U	3.16	19.3		3.13	33.3		3.34	9.70		3.34	8.97		3.26
Pyrene	PAH	3.36	U	3.36	3.59	U	3.59	3.16	UJ	3.16	262	J	3.13	104	J	3.34	33.3	J	3.34	30.5	J	3.26
Aldrin	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Alpha-BHC	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
alpha-Chlordane	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
beta-BHC	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Delta-BHC	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
4,4'-DDD	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
4,4'-DDE	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	2.9	JD	2.9	1.32	UD	1.32	1.34	UD	1.34
4,4'-DDT	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Dieldrin	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endosulfan I	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endosulfan II	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endosulfan sulfate	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endrin	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endrin aldehyde	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Endrin ketone	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
gamma-Chlordane	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Heptachlor	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Heptachlor epoxide	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Methoxychlor	PEST	1.39	UD	1.39	1.43	UD	1.43	1.29	UD	1.29	1.36	UD	1.36	1.35	UD	1.35	1.32	UD	1.32	1.34	UD	1.34
Toxaphene	PEST	20.8	UD	20.8	21.5	UD	21.5	19.3	UDJ	19.3	20.4	UDJ	20.4	20.2	UDJ	20.2	19.9	UDJ	19.9	20.1	UDJ	20.1

Attachment 1 Sheet No. 17 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B856			J1B866			J1B854			J1B855			J1B857			J1B858			J1B859		
		A3			Duplicate of J1B856			A1			A2			A4			A5			A6		
		6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10			6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1221	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1232	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1242	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1248	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1254	PCB	3.61	J	3.61	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
Aroclor-1260	PCB	12.5	U	12.5	13.1	U	13.1	13.4	U	13.4	13.5	U	13.5	12.9	U	12.9	12.7	U	12.7	13.2	U	13.2
1,2,4-Trichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
1,2-Dichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
1,3-Dichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
1,4-Dichlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4,5-Trichlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4,6-Trichlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4-Dichlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4-Dimethylphenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,4-Dinitrophenol	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
2,4-Dinitrotoluene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2,6-Dinitrotoluene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Chloronaphthalene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Chlorophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Methylnaphthalene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Methylphenol (cresol, o-)	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
2-Nitroaniline	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
2-Nitrophenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
3+4 Methylphenol (cresol, m+p)	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
3,3'-Dichlorobenzidine	SVOA	638	U	638	653	U	653	663	U	663	633	U	633	657	U	657	674	U	674	662	U	662
3-Nitroaniline	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Bromophenylphenyl ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Chloro-3-methylphenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Chloroaniline	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Chlorophenylphenyl ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
4-Nitroaniline	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
4-Nitrophenol	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
Acenaphthene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Acenaphthylene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Anthracene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Benzo(a)anthracene	SVOA	88.5	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	103	J	331
Benzo(a)pyrene	SVOA	115	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	110	J	331
Benzo(b)fluoranthene	SVOA	69.4	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	76.9	J	331
Benzo(ghi)perylene	SVOA	88.2	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	75.6	J	331

Attachment	1	Sheet No.	18 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B860			J1B861			J1B862			J1JVX2			J1B863			J1B864			J1B865			J1B887			J1B892		
		A7			A8			A9			A9[a]			A10			A11			A12			B8			Duplicate of J1B886		
		6/30/10			6/30/10			6/30/10			6/16/11			6/30/10			6/30/10			6/30/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	2.8	U	2.8	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1221	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	8.0	U	8.0	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1232	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	2.0	U	2.0	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1242	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	4.7	U	4.7	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1248	PCB	13.6	U	13.6	13.2	U	13.2	13	U	13	4.7	U	4.7	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1254	PCB	13.6	U	13.6	8.05	J	13.2	4.4	J	13	2.6	U	2.6	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
Aroclor-1260	PCB	13.6	U	13.6	13.2	U	13.2	101	J	13	2.6	U	2.6	13.3	U	13.3	12.7	U	12.7	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4
1,2,4-Trichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
1,2-Dichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	21	U	21	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
1,3-Dichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	11	U	11	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
1,4-Dichlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	13	U	13	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4,5-Trichlorophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4,6-Trichlorophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4-Dichlorophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4-Dimethylphenol	SVOA	340	U	340	332	U	332	328	U	328	63	U	63	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,4-Dinitrophenol	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	320	U	320	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
2,4-Dinitrotoluene	SVOA	340	U	340	332	U	332	328	U	328	63	U	63	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2,6-Dinitrotoluene	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Chloronaphthalene	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Chlorophenol	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Methylnaphthalene	SVOA	340	U	340	332	U	332	328	U	328	18	U	18	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Methylphenol (cresol, o-)	SVOA	340	U	340	332	U	332	328	U	328	12	U	12	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
2-Nitroaniline	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	47	U	47	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
2-Nitrophenol	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
3+4 Methylphenol (cresol, m+p)	SVOA	340	U	340	332	U	332	328	U	328	31	U	31	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
3,3'-Dichlorobenzidine	SVOA	680	U	680	664	U	664	657	U	657	85	U	85	679	U	679	647	U	647	659	U	659	667	U	667	690	U	690
3-Nitroaniline	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	69	U	69	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	332	U	332	328	U	328	310	U	310	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Bromophenylphenyl ether	SVOA	340	U	340	332	U	332	328	U	328	18	U	18	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Chloro-3-methylphenol	SVOA	340	U	340	332	U	332	328	U	328	63	U	63	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Chloroaniline	SVOA	340	U	340	332	U	332	328	U	328	78	U	78	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Chlorophenylphenyl ether	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
4-Nitroaniline	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	69	U	69	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
4-Nitrophenol	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	92	U	92	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
Acenaphthene	SVOA	340	U	340	332	U	332	328	U	328	9.8	U	9.8	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Acenaphthylene	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Anthracene	SVOA	340	U	340	332	U	332	328	U	328	.16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(a)anthracene	SVOA	60.6	J	340	332	U	332	328	U	328	36	J	19	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(a)pyrene	SVOA	68	J	340	332	U	332	62.6	J	328	110	J	19	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(b)fluoranthene	SVOA	52.2	J	340	332	U	332	52.5	J	328	130	JK	25	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Benzo(ghi)perylene	SVOA	340	U	340	332	U	332	328	U	328	110	J	15	340	U	340	51.3	J	324	329	U	329	333	U	333	345	U	345

Attachment	1	Sheet No.	19 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B880			J1B881			J1B882			J1B883			J1B884			J1B885			J1B886			J1B888			J1B889		
		B1			B2			B3			B4			B13[b]			B6			B7			B9			B10		
		6/30/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1221	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1232	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1242	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1248	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
Aroclor-1254	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	8.75	J	13.2
Aroclor-1260	PCB	13.3	U	13.3	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.7	U	13.7	13.2	U	13.2	13.3	U	13.3	13.6	U	13.6	13.2	U	13.2
1,2,4-Trichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
1,2-Dichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
1,3-Dichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
1,4-Dichlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4,5-Trichlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4,6-Trichlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4-Dichlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4-Dimethylphenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,4-Dinitrophenol	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
2,4-Dinitrotoluene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2,6-Dinitrotoluene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Chloronaphthalene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Chlorophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Methylnaphthalene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Methylphenol (cresol, o-)	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
2-Nitroaniline	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
2-Nitrophenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
3+4 Methylphenol (cresol, m+p)	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
3,3'-Dichlorobenzidine	SVOA	649	U	649	672	U	672	661	U	661	644	U	644	651	U	651	641	U	641	663	U	663	665	U	665	618	U	618
3-Nitroaniline	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
4,6-Dinitro-2-methylphenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Bromophenylphenyl ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Chloro-3-methylphenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Chloroaniline	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Chlorophenylphenyl ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
4-Nitroaniline	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
4-Nitrophenol	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
Acenaphthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Acenaphthylene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Anthracene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(a)anthracene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(a)pyrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(b)fluoranthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Benzo(ghi)perylene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309

Attachment	1	Sheet No.	20 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B890			J1B891			J1B8B0			J1B8B5			J1B893			J1B894			J1B895			J1B896		
		B11			B12			C8			Duplicate of J1B8B0			C1			C2			C3			C4		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/17/10			6/17/10			6/17/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1221	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1232	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1242	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1248	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1254	PCB	13.6	U	13.6	14.2	U	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
Aroclor-1260	PCB	13.6	U	13.6	3.73	J	14.2	12.9	U	12.9	13.3	U	13.3	14.1	U	14.1	13	U	13	13	U	13	13.6	U	13.6
1,2,4-Trichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
1,2-Dichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
1,3-Dichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
1,4-Dichlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4,5-Trichlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4,6-Trichlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4-Dichlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4-Dimethylphenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,4-Dinitrophenol	SVOA	1650	U	1650	1650	U	1650	1650	UJ	1650	1650	UJ	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
2,4-Dinitrotoluene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2,6-Dinitrotoluene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Chloronaphthalene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Chlorophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Methylnaphthalene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Methylphenol (cresol, o-)	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
2-Nitroaniline	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
2-Nitrophenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
3+4 Methylphenol (cresol, m+p)	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
3,3'-Dichlorobenzidine	SVOA	660	U	660	661	U	661	661	U	661	662	U	662	698	U	698	674	U	674	663	U	663	673	U	673
3-Nitroaniline	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Bromophenylphenyl ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Chloro-3-methylphenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Chloroaniline	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Chlorophenylphenyl ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
4-Nitroaniline	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
4-Nitrophenol	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
Acenaphthene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Acenaphthylene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Anthracene	SVOA	330	U	330	62.5	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(a)anthracene	SVOA	330	U	330	164	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(a)pyrene	SVOA	330	U	330	130	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(b)fluoranthene	SVOA	330	U	330	143	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Benzo(ghi)perylene	SVOA	330	U	330	93.8	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336

Attachment 1 Sheet No. 21 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment I. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B897			J1B8B1			J1B899			J1B898			J1B8B2			J1B8B3			J1B8B4		
		C5			C6			C7			C9			C10			C11			C12		
		6/17/10			6/17/10			6/29/10			6/29/10			6/17/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1221	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1232	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1242	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1248	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1254	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1260	PCB	13.8	U	13.8	14.3	U	14.3	12.9	U	12.9	13.6	U	13.6	3.4	J	13.4	13.2	U	13.2	13.4	U	13.4
1,2,4-Trichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
1,2-Dichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
1,3-Dichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
1,4-Dichlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4,5-Trichlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4,6-Trichlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4-Dichlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4-Dimethylphenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,4-Dinitrophenol	SVOA	1740	U	1740	1790	U	1790	1660	UJ	1660	1600	UJ	1600	1630	UJ	1630	1640	UJ	1640	1570	UJ	1570
2,4-Dinitrotoluene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2,6-Dinitrotoluene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Chloronaphthalene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Chlorophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Methylnaphthalene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Methylphenol (cresol, o-)	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
2-Nitroaniline	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
2-Nitrophenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
3+4 Methylphenol (cresol, m+p)	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
3,3'-Dichlorobenzidine	SVOA	695	U	695	716	U	716	663	U	663	640	U	640	654	U	654	655	U	655	630	U	630
3-Nitroaniline	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
4,6-Dinitro-2-methylphenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Bromophenylphenyl ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Chloro-3-methylphenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Chloroaniline	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Chlorophenylphenyl ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
4-Nitroaniline	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
4-Nitrophenol	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
Acenaphthene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Acenaphthylene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Anthracene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Benzo(a)anthracene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	77.1	J	327	327	U	327	315	U	315
Benzo(a)pyrene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	83.7	J	327	327	U	327	315	U	315
Benzo(b)fluoranthene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	72.9	J	327	327	U	327	315	U	315
Benzo(ghi)perylene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	68.4	J	327	327	U	327	315	U	315

Attachment 1 Sheet No. 22 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B856 A3 6/30/10 ug/kg	Q	PQL	J1B866 Duplicate of J1B856 6/30/10 ug/kg	Q	PQL	J1B854 A1 6/30/10 ug/kg	Q	PQL	J1B855 A2 6/30/10 ug/kg	Q	PQL	J1B857 A4 6/30/10 ug/kg	Q	PQL	J1B858 A5 6/30/10 ug/kg	Q	PQL	J1B859 A6 6/30/10 ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	85	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	102	J	331
Bis(2-chloro-1-methylethyl)ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Bis(2-Chloroethoxy)methane	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Bis(2-chloroethyl) ether	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Bis(2-ethylhexyl) phthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Butylbenzylphthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Carbazole	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Chrysene	SVOA	108	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	115	J	331
Di-n-butylphthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Di-n-octylphthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Dibenz[a,h]anthracene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Dibenzofuran	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Diethyl phthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Dimethyl phthalate	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Fluoranthene	SVOA	145	J	145	57	J	327	332	U	332	317	U	317	328	U	328	337	U	337	185	J	331
Fluorene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachlorobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachlorobutadiene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachlorocyclopentadiene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Hexachloroethane	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Indeno(1,2,3-cd)pyrene	SVOA	67.3	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	63.6	J	331
Isophorone	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
N-Nitroso-di-n-dipropylamine	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
N-Nitrosodiphenylamine	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Naphthalene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Nitrobenzene	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Pentachlorophenol	SVOA	1590	U	1590	1630	U	1630	1660	U	1660	1580	U	1580	1640	U	1640	1690	U	1690	1650	U	1650
Phenanthrene	SVOA	84.8	J	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	67.9	J	331
Phenol	SVOA	319	U	319	327	U	327	332	U	332	317	U	317	328	U	328	337	U	337	331	U	331
Pyrene	SVOA	209	J	319	58.3	J	327	332	U	332	317	U	317	328	U	328	337	U	337	190	J	331

Attachment	1	Sheet No.	23 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B860			J1B861			J1B862			J1JVX2			J1B863			J1B864			J1B865			J1B887			J1B892		
		A7			A8			A9			A9*			A10			A11			A12			B8			Duplicate of J1B886		
		6/30/10			6/30/10			6/30/10			6/16/11			6/30/10			6/30/10			6/30/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	56.5	J	340	332	U	332	65.8	J	328	38	UK	38	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-chloro-1-methylethyl)ether	SVOA	340	U	340	332	U	332	328	U	328	22	U	22	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-Chloroethoxy)methane	SVOA	340	U	340	332	U	332	328	U	328	22	U	22	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-chloroethyl) ether	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Bis(2-ethylhexyl) phthalate	SVOA	340	U	340	332	U	332	328	U	328	71	JB	44	144	J	340	324	U	324	329	U	329	333	U	333	345	U	345
Butylbenzylphthalate	SVOA	340	U	340	332	U	332	328	U	328	41	U	41	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Carbazole	SVOA	340	U	340	332	U	332	328	U	328	34	U	34	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Chrysene	SVOA	72.2	J	340	332	U	332	55.9	J	328	49	J	26	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Di-n-butylphthalate	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Di-n-octylphthalate	SVOA	340	U	340	332	U	332	328	U	328	14	U	14	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Dibenz[a,h]anthracene	SVOA	340	U	340	332	U	332	328	U	328	22	J	18	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Dibenzofuran	SVOA	340	U	340	332	U	332	328	U	328	19	U	19	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Diethyl phthalate	SVOA	340	U	340	332	U	332	328	U	328	25	U	25	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Dimethyl phthalate	SVOA	340	U	340	332	U	332	328	U	328	22	U	22	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Fluoranthene	SVOA	116	J	340	332	U	332	87.9	J	328	58	J	34	340	U	340	324	U	324	53.7	J	329	333	U	333	345	U	345
Fluorene	SVOA	340	U	340	332	U	332	328	U	328	17	U	17	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachlorobenzene	SVOA	340	U	340	332	U	332	328	U	328	27	U	27	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachlorobutadiene	SVOA	340	U	340	332	U	332	328	U	328	9.5	U	9.5	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachlorocyclopentadiene	SVOA	340	U	340	332	U	332	328	U	328	47	U	47	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Hexachloroethane	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Indeno(1,2,3-cd)pyrene	SVOA	340	U	340	332	U	332	328	U	328	75	J	21	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Isophorone	SVOA	340	U	340	332	U	332	328	U	328	16	U	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
N-Nitroso-di-n-dipropylamine	SVOA	340	U	340	332	U	332	328	U	328	29	U	29	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
N-Nitrosodiphenylamine	SVOA	340	U	340	332	U	332	328	U	328	20	U	20	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Naphthalene	SVOA	340	U	340	332	U	332	328	U	328	29	U	29	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Nitrobenzene	SVOA	340	U	340	332	U	332	328	U	328	21	U	21	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Pentachlorophenol	SVOA	1700	U	1700	1660	U	1660	1640	U	1640	310	U	310	1700	U	1700	1620	U	1620	1650	U	1650	1670	U	1670	1720	U	1720
Phenanthrene	SVOA	340	U	340	332	U	332	328	U	328	28	J	16	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Phenol	SVOA	340	U	340	332	U	332	328	U	328	17	U	17	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345
Pyrene	SVOA	117	J	340	332	U	332	72.5	J	328	69	J	11	340	U	340	324	U	324	329	U	329	333	U	333	345	U	345

Attachment 1	Sheet No. 24 of 45
Originator T. E. Queen	Date 7/13/11
Checked J. D. Skoglie	Date 7/13/11
Calc. No. 0100H-CA-V0178	Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B880			J1B881			J1B882			J1B883			J1B884			J1B885			J1B886			J1B888			J1B889		
		B1			B2			B3			B4			B13[b]			B6			B7			B9			B10		
		6/30/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-chloro-1-methylethyl)ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-Chloroethoxy)methane	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-chloroethyl) ether	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Bis(2-ethylhexyl) phthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Butylbenzylphthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Carbazole	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Chrysene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Di-n-butylphthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Di-n-octylphthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Dibenz[a,h]anthracene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Dibenzofuran	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Diethyl phthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Dimethyl phthalate	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Fluoranthene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	62.5	J	309
Fluorene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachlorobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachlorobutadiene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachlorocyclopentadiene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Hexachloroethane	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Indeno(1,2,3-cd)pyrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Isophorone	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
N-Nitroso-di-n-dipropylamine	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
N-Nitrosodiphenylamine	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Naphthalene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Nitrobenzene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Pentachlorophenol	SVOA	1620	U	1620	1680	U	1680	1650	U	1650	1610	U	1610	1630	U	1630	1600	U	1600	1660	U	1660	1660	U	1660	1550	U	1550
Phenanthrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Phenol	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	321	U	321	331	U	331	333	U	333	309	U	309
Pyrene	SVOA	324	U	324	336	U	336	331	U	331	322	U	322	326	U	326	56	J	321	331	U	331	333	U	333	62.5	J	309

Attachment	1	Sheet No.	25 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B890			J1B891			J1B8B0			J1B8B5			J1B893			J1B894			J1B895			J1B896		
		B11			B12			C8			Duplicate of J1B8B0			C1			C2			C3			C4		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/17/10			6/17/10			6/17/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	330	U	330	113	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-chloro-1-methylethyl)ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-Chloroethoxy)methane	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-chloroethyl) ether	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Bis(2-ethylhexyl) phthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Butylbenzylphthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Carbazole	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Chrysene	SVOA	330	U	330	160	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Di-n-butylphthalate	SVOA	330	U	330	330	U	330	331	UJ	331	331	UJ	331	349	U	349	337	U	337	332	U	332	336	U	336
Di-n-octylphthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Dibenz[a,h]anthracene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Dibenzofuran	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Diethyl phthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Dimethyl phthalate	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Fluoranthene	SVOA	330	U	330	343		330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Fluorene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachlorobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachlorobutadiene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachlorocyclopentadiene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Hexachloroethane	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Indeno(1,2,3-cd)pyrene	SVOA	330	U	330	77.7	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Isophorone	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
N-Nitroso-di-n-dipropylamine	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
N-Nitrosodiphenylamine	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Naphthalene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Nitrobenzene	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Pentachlorophenol	SVOA	1650	U	1650	1650	U	1650	1650	U	1650	1650	U	1650	1750	U	1750	1690	U	1690	1660	U	1660	1680	U	1680
Phenanthrene	SVOA	330	U	330	243	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Phenol	SVOA	330	U	330	330	U	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336
Pyrene	SVOA	330	U	330	280	J	330	331	U	331	331	U	331	349	U	349	337	U	337	332	U	332	336	U	336

Attachment 1 Sheet No. 26 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B897			J1B8B1			J1B899			J1B898			J1B8B2			J1B8B3			J1B8B4		
		C5			C6			C7			C9			C10			C11			C12		
		6/17/10			6/17/10			6/29/10			6/29/10			6/17/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	80	J	327	327	U	327	315	U	315
Bis(2-chloro-1-methylethyl)ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Bis(2-Chloroethoxy)methane	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Bis(2-chloroethyl) ether	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Bis(2-ethylhexyl) phthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Butylbenzylphthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Carbazole	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Chrysene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	121	J	327	327	U	327	315	U	315
Di-n-butylphthalate	SVOA	347	U	347	358	U	358	331	UJ	331	320	UJ	320	327	UJ	327	327	UJ	327	315	UJ	315
Di-n-octylphthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Dibenz[a,h]anthracene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Dibenzofuran	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Diethyl phthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Dimethyl phthalate	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Fluoranthene	SVOA	347	U	347	358	U	358	331	U	331	56.9	J	320	198	J	327	327	U	327	86.1	J	315
Fluorene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachlorobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachlorobutadiene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachlorocyclopentadiene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Hexachloroethane	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Indeno(1,2,3-cd)pyrene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	50.5	J	327	327	U	327	315	U	315
Isophorone	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
N-Nitroso-di-n-dipropylamine	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
N-Nitrosodiphenylamine	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Naphthalene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Nitrobenzene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Pentachlorophenol	SVOA	1740	U	1740	1790	U	1790	1660	U	1660	1600	U	1600	1630	U	1630	1640	U	1640	1570	U	1570
Phenanthrene	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	166	J	327	327	U	327	55.4	J	315
Phenol	SVOA	347	U	347	358	U	358	331	U	331	320	U	320	327	U	327	327	U	327	315	U	315
Pyrene	SVOA	347	U	347	358	U	358	331	U	331	51.4	J	320	245	J	327	327	U	327	71.1	J	315

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Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C0			J1B8C8			J1B8B6			J1B8B7			J1B8B8			J1B8B9			J1B8C1			J1B8C2			J1B8C3		
		D5			Duplicate of J1B8C0			D1			D2			D3			D4			D6			D7			D8		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	19.4		3.38	3.31	U	3.31	3.58	U	3.58	2.31	J	3.30	9.82		3.38	3.35	U	3.35
Acenaphthylene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Anthracene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Benzo(a)anthracene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	22.6	J	3.38	1.84	J	3.31	3.58	UJ	3.58	2.59	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(a)pyrene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	11.0	J	3.38	3.31	UJ	3.31	3.58	UJ	3.58	3.52	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(b)fluoranthene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	14.3	J	3.38	3.31	UJ	3.31	3.58	UJ	3.58	5.39	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(ghi)perylene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	7.96	J	3.38	3.31	UJ	3.31	1.06	J	3.58	2.97	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Benzo(k)fluoranthene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	4.70		3.38	3.31	U	3.31	3.58	U	3.58	1.78	J	3.30	3.38	U	3.38	3.35	U	3.35
Chrysene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	14.2	J	3.38	3.31	UJ	3.31	3.58	UJ	3.58	3.30	UJ	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Dibenz[a,h]anthracene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Fluoranthene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	42.4	J	3.38	2.49	J	3.31	5.19	J	3.58	28.2	J	3.30	2.2	J	3.38	27.3	J	3.35
Fluorene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Indeno(1,2,3-cd)pyrene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	3.38	UJ	3.38	4.76	J	3.31	2.33	J	3.58	2.00	J	3.30	2.01	J	3.38	3.35	UJ	3.35
Naphthalene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	3.38	U	3.38	3.31	U	3.31	3.58	U	3.58	3.30	U	3.30	3.38	U	3.38	3.35	U	3.35
Phenanthrene	PAH	3.36	U	3.36	3.48	U	3.48	3.28	U	3.28	25.7		3.38	2.15	J	3.31	0.967	J	3.58	5.45		3.30	1.02	J	3.38	3.35	U	3.35
Pyrene	PAH	3.36	UJ	3.36	3.48	UJ	3.48	3.28	UJ	3.28	5.66	J	3.38	1.69	J	3.31	1.09	J	3.58	6.77	J	3.30	3.38	UJ	3.38	3.35	UJ	3.35
Aldrin	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Alpha-BHC	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
alpha-Chlordane	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
beta-BHC	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Delta-BHC	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
4,4'-DDD	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
4,4'-DDE	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	2.46	JD	2.46	1.33	UD	1.33	1.43	UD	1.43	1.54	JD	1.54	1.33	UD	1.33	1.34	UD	1.34
4,4'-DDT	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Dieldrin	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endosulfan I	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endosulfan II	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endosulfan sulfate	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endrin	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endrin aldehyde	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Endrin ketone	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
gamma-Chlordane	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Heptachlor	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Heptachlor epoxide	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Methoxychlor	PEST	1.33	UD	1.33	1.42	UD	1.42	1.34	UD	1.34	1.33	UD	1.33	1.33	UD	1.33	1.43	UD	1.43	1.33	UD	1.33	1.33	UD	1.33	1.34	UD	1.34
Toxaphene	PEST	19.9	UDJ	19.9	21.4	UDJ	21.4	20.2	UDJ	20.2	19.9	UDJ	19.9	20.0	UDJ	20.0	21.4	UDJ	21.4	20.0	UDJ	20.0	20.0	UDJ	20.0	20.1	UDJ	20.1

Attachment 1 Sheet No. 28 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C4			J1B8C5			J1B8C6			J1B8C7			J1JCT4			J1JCV1			J1JCR9			J1JCT0		
		D9			D10			D11			D12			E-6			Duplicate of J1JCT4			E-1			E-2		
		6/29/10			6/29/10			6/29/10			6/29/10			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.44	U	3.44	15.6		3.32	34.0		3.28	2.87	J	3.19	10	U	10	10	U	10	11	U	11	10	U	10
Acenaphthylene	PAH	3.44	U	3.44	21.6		3.32	66.2		3.28	3.19	U	3.19	9.1	U	9.1	9.0	U	9.0	10	U	10	9.0	U	9.0
Anthracene	PAH	3.44	U	3.44	3.32	U	3.32	1.31	J	3.28	3.19	U	3.19	3.1	U	3.1	3.1	U	3.1	3.5	U	3.5	3.1	U	3.1
Benzo(a)anthracene	PAH	6.21	J	3.44	5.09	J	3.32	19.1	J	3.28	2.65	J	3.19	3.2	U	3.2	3.2	U	3.2	3.6	U	3.6	3.2	U	3.2
Benzo(a)pyrene	PAH	7.91	J	3.44	8.22	J	3.32	24.3	J	3.28	1.59	J	3.19	6.5	U	6.5	6.4	U	6.4	7.3	U	7.3	6.4	U	6.4
Benzo(b)fluoranthene	PAH	4.75	J	3.44	9.58	J	3.32	27.9	J	3.28	1.59	J	3.19	4.2	U	4.2	4.2	U	4.2	4.8	U	4.8	4.2	U	4.2
Benzo(ghi)perylene	PAH	4.56	J	3.44	6.44	J	3.32	15.9	J	3.28	1.28	J	3.19	7.3	U	7.3	7.2	U	7.2	8.2	U	8.2	7.2	U	7.2
Benzo(k)fluoranthene	PAH	2.75	J	3.44	3.34		3.32	9.49		3.28	0.925	J	3.19	4.0	U	4.0	3.9	U	3.9	4.5	U	4.5	4.0	U	4.0
Chrysene	PAH	5.4	J	3.44	8.37	J	3.32	17.9	J	3.28	1.13	J	3.19	4.9	U	4.9	4.8	U	4.8	5.5	U	5.5	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	3.44	U	3.44	1.10	J	3.32	2.59	J	3.28	3.19	U	3.19	11	U	11	11	U	11	13	U	13	11	U	11
Fluoranthene	PAH	16	J	3.44	27.6	J	3.32	57.3	J	3.28	3.35	J	3.19	13	U	13	13	U	13	15	U	15	13	U	13
Fluorene	PAH	3.44	U	3.44	1.10	J	3.32	4.27		3.28	3.19	U	3.19	5.3	U	5.3	5.3	U	5.3	6.0	U	6.0	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	4.68	J	3.44	4.19	J	3.32	13.7	J	3.28	1.67	J	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Naphthalene	PAH	3.44	U	3.44	3.32	U	3.32	6.57		3.28	3.19	U	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Phenanthrene	PAH	5.68		3.44	9.15		3.32	19.5		3.28	1.12	J	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Pyrene	PAH	12.6	J	3.44	16.3	J	3.32	58.6	J	3.28	2.95	J	3.19	12	U	12	12	U	12	14	U	14	12	U	12
Aldrin	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.25	U	0.25	0.25	U	0.25	0.29	U	0.29	0.25	U	0.25
Alpha-BHC	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.21	U	0.21	0.22	U	0.22	0.24	U	0.24	0.21	U	0.21
alpha-Chlordane	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.32	U	0.32	0.32	U	0.32	0.37	U	0.37	0.32	U	0.32
beta-BHC	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.67	U	0.67	0.67	U	0.67	0.76	U	0.76	0.65	U	0.65
Delta-BHC	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.40	U	0.40	0.40	U	0.40	0.46	U	0.46	0.39	U	0.39
4,4'-DDD	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.55	U	0.55	0.55	U	0.55	0.62	U	0.62	0.54	U	0.54
4,4'-DDE	PEST	1.36	UD	1.36	2.02	JD	2.02	1.35	UD	1.35	1.34	UD	1.34	0.24	U	0.24	0.24	U	0.24	0.27	U	0.27	0.23	U	0.23
4,4'-DDT	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.59	U	0.59	0.59	U	0.59	0.67	U	0.67	0.58	U	0.58
Dieldrin	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.21	U	0.21	0.21	U	0.21	0.24	U	0.24	0.21	U	0.21
Endosulfan I	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.18	U	0.18	0.18	U	0.18	0.2	U	0.2	0.17	U	0.17
Endosulfan II	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.29	U	0.29	0.29	U	0.29	0.33	U	0.33	0.28	U	0.28
Endosulfan sulfate	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.28	U	0.28	0.28	U	0.28	0.31	U	0.31	0.27	U	0.27
Endrin	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.31	U	0.31	0.31	U	0.31	0.35	U	0.35	0.3	U	0.3
Endrin aldehyde	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.17	U	0.17	0.17	U	0.17	0.19	U	0.19	0.17	U	0.17
Endrin ketone	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.49	U	0.49	0.49	U	0.49	0.56	U	0.56	0.48	U	0.48
Gamma-BHC (Lindane)	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.46	U	0.46	0.47	U	0.47	0.53	U	0.53	0.46	U	0.46
gamma-Chlordane	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.27	U	0.27	0.27	U	0.27	0.3	U	0.3	0.26	U	0.26
Heptachlor	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.21	U	0.21	0.22	U	0.22	0.24	U	0.24	0.21	U	0.21
Heptachlor epoxide	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.43	U	0.43	0.43	U	0.43	0.48	U	0.48	0.42	U	0.42
Methoxychlor	PEST	1.36	UD	1.36	1.33	UD	1.33	1.35	UD	1.35	1.34	UD	1.34	0.45	U	0.45	0.45	U	0.45	0.51	U	0.51	0.44	U	0.44
Toxaphene	PEST	20.4	UDJ	20.4	19.9	UDJ	19.9	20.3	UDJ	20.3	20.1	UDJ	20.1	16	U	16	16	U	16	18	U	18	16	U	16

Attachment 1 Sheet No. 29 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCT1			J1JCT2			J1JCT3			J1JCT5			J1JCT6			J1JCT7			J1JCT8			J1JCT9		
		E-3			E-4			E-5			E-7			E-8			E-9			E-10			E-11		
		5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	10	U	10	10	U	10	9.8	U	9.8	9.8	U	9.8	10	U	10	10	U	10
Acenaphthylene	PAH	9.0	U	9.0	9.0	U	9.0	9.1	U	9.1	9.0	U	9.0	8.8	U	8.8	8.9	U	8.9	9.2	U	9.2	9.2	U	9.2
Anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.1	U	3.1	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1	12	J	3.3	3.2	U	3.2
Benzo(a)pyrene	PAH	6.4	U	6.4	6.4	U	6.4	6.5	U	6.5	6.4	U	6.4	6.3	U	6.3	6.3	U	6.3	6.6	U	6.6	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.1	U	4.1	13	J	4.3	4.3	U	4.3
Benzo(ghi)perylene	PAH	7.2	U	7.2	7.2	U	7.2	7.2	U	7.2	7.2	U	7.2	7.0	U	7.0	7.1	U	7.1	7.4	U	7.4	7.3	U	7.3
Benzo(k)fluoranthene	PAH	3.9	U	3.9	4.0	U	4.0	4.0	U	4.0	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	4.0	U	4.0	4.0	U	4.0
Chrysene	PAH	4.9	U	4.9	4.9	U	4.9	4.9	U	4.9	4.8	U	4.8	4.7	U	4.7	4.8	U	4.8	15	J	4.9	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	23	J	13	13	U	13
Fluorene	PAH	5.3	U	5.3	5.3	U	5.3	5.3	U	5.3	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.4	U	5.4	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	30	J	12	12	U	12
Aldrin	PEST	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.24	U	0.24	0.25	U	0.25	0.25	U	0.25	0.26	U	0.26
Alpha-BHC	PEST	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
alpha-Chlordane	PEST	0.33	U	0.33	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32	0.31	U	0.31	0.32	U	0.32	0.33	U	0.33	0.33	U	0.33
beta-BHC	PEST	0.67	U	0.67	0.67	U	0.67	0.65	U	0.65	0.67	U	0.67	0.64	U	0.64	0.66	U	0.66	0.67	U	0.67	0.68	U	0.68
Delta-BHC	PEST	0.41	U	0.41	0.40	U	0.40	0.39	U	0.39	0.4	U	0.4	0.38	U	0.38	0.40	U	0.40	0.41	U	0.41	0.41	U	0.41
4,4'-DDD	PEST	0.55	U	0.55	0.55	U	0.55	0.54	U	0.54	0.55	U	0.55	0.52	U	0.52	0.54	U	0.54	0.55	U	0.55	0.56	U	0.56
4,4'-DDE	PEST	0.24	U	0.24	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24
4,4'-DDT	PEST	0.6	U	0.6	0.59	U	0.59	0.58	U	0.58	0.59	U	0.59	0.57	U	0.57	0.59	U	0.59	0.6	U	0.6	0.61	U	0.61
Dieldrin	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22
Endosulfan I	PEST	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18
Endosulfan II	PEST	0.29	U	0.29	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29	0.29	U	0.29	0.29	U	0.29
Endosulfan sulfate	PEST	0.28	U	0.28	0.28	U	0.28	0.27	U	0.27	0.28	U	0.28	0.26	U	0.26	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28
Endrin	PEST	0.31	U	0.31	0.31	U	0.31	0.30	U	0.30	0.31	U	0.31	0.29	U	0.29	0.3	U	0.3	0.31	U	0.31	0.31	U	0.31
Endrin aldehyde	PEST	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.16	U	0.16	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endrin ketone	PEST	0.5	U	0.5	0.49	U	0.49	0.48	U	0.48	0.49	U	0.49	0.47	U	0.47	0.49	U	0.49	0.50	U	0.50	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.47	U	0.47	0.47	U	0.47	0.45	U	0.45	0.47	U	0.47	0.45	U	0.45	0.46	U	0.46	0.47	U	0.47	0.48	U	0.48
gamma-Chlordane	PEST	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27
Heptachlor	PEST	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
Heptachlor epoxide	PEST	0.43	U	0.43	0.43	U	0.43	0.42	U	0.42	0.43	U	0.43	0.41	U	0.41	0.42	U	0.42	0.43	U	0.43	0.44	U	0.44
Methoxychlor	PEST	0.46	U	0.46	0.45	U	0.45	0.44	U	0.44	0.45	U	0.45	0.43	U	0.43	0.45	U	0.45	0.46	U	0.46	0.46	U	0.46
Toxaphene	PEST	16	U	16	16	U	16	15	U	15	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16

Attachment	1	Sheet No.	30 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV0			J1JCV3			J1JCW4			J1JCV2			J1JCV4			J1JCV5			J1JCV6			J1JCV7		
		E-12			F-2			Duplicate of J1JCV3			F-1			F-3			F-4			F-5			F-6		
		5/31/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.7	U	9.7	10	U	10	10	U	10	9.9	U	9.9	9.9	U	9.9	9.9	U	9.9	9.8	U	9.8	10	U	10
Acenaphthylene	PAH	8.7	U	8.7	9.4	U	9.4	9.1	U	9.1	8.9	U	8.9	8.9	U	8.9	8.9	U	8.9	8.8	U	8.8	9.4	U	9.4
Anthracene	PAH	3.0	U	3.0	3.2	U	3.2	3.1	U	3.1	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.2	U	3.2
Benzo(a)anthracene	PAH	3.1	U	3.1	3.3	U	3.3	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.3	U	3.3
Benzo(a)pyrene	PAH	6.2	U	6.2	6.7	U	6.7	6.5	U	6.5	6.4	U	6.4	6.4	U	6.4	6.3	U	6.3	6.3	U	6.3	6.7	U	6.7
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.4	U	4.4	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.4	U	4.4
Benzo(ghi)perylene	PAH	7.0	U	7.0	7.5	U	7.5	7.2	U	7.2	7.1	U	7.1	7.2	U	7.2	7.1	U	7.1	7.1	U	7.1	7.5	U	7.5
Benzo(k)fluoranthene	PAH	3.8	U	3.8	4.1	U	4.1	4.0	U	4.0	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	4.1	U	4.1
Chrysene	PAH	4.7	U	4.7	5.1	U	5.1	4.9	U	4.9	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	5.1	U	5.1
Dibenz[a,h]anthracene	PAH	11	U	11	12	U	12	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	12	U	12
Fluoranthene	PAH	13	U	13	14	U	14	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14
Fluorene	PAH	5.1	U	5.1	5.5	U	5.5	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2	5.5	U	5.5
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Naphthalene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Phenanthrene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Pyrene	PAH	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Aldrin	PEST	0.25	U	0.25	0.24	U	0.24	0.25	U	0.25	0.26	U	0.26	0.26	U	0.26	0.25	U	0.25	0.24	U	0.24	0.26	U	0.26
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22
alpha-Chlordane	PEST	0.32	U	0.32	0.31	U	0.31	0.32	U	0.32	0.33	U	0.33	0.33	U	0.33	0.32	U	0.32	0.32	U	0.32	0.33	U	0.33
beta-BHC	PEST	0.66	U	0.66	0.65	U	0.65	0.65	U	0.65	0.68	U	0.68	0.68	U	0.68	0.66	U	0.66	0.65	U	0.65	0.68	U	0.68
Delta-BHC	PEST	0.4	U	0.40	0.39	U	0.39	0.39	U	0.39	0.41	U	0.41	0.41	U	0.41	0.40	U	0.40	0.39	U	0.39	0.41	U	0.41
4,4'-DDD	PEST	0.54	U	0.54	0.53	U	0.53	0.54	U	0.54	0.56	U	0.56	0.56	U	0.56	0.54	U	0.54	0.53	U	0.53	0.56	U	0.56
4,4'-DDE	PEST	0.24	U	0.24	0.23	U	0.23	0.23	U	0.23	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24
4,4'-DDT	PEST	0.59	U	0.59	0.58	U	0.58	0.58	U	0.58	0.61	U	0.61	0.61	U	0.61	0.59	U	0.59	0.58	U	0.58	0.61	U	0.61
Dieldrin	PEST	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21	0.20	U	0.20	0.22	U	0.22
Endosulfan I	PEST	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18
Endosulfan II	PEST	0.29	U	0.29	0.28	U	0.28	0.28	U	0.28	0.29	U	0.29	0.29	U	0.29	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29
Endosulfan sulfate	PEST	0.27	U	0.27	0.27	U	0.27	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28	0.27	U	0.27	0.27	U	0.27	0.28	UN	0.28
Endrin	PEST	0.3	U	0.30	0.3	U	0.3	0.3	U	0.3	0.31	U	0.31	0.31	U	0.31	0.30	U	0.30	0.30	U	0.30	0.31	U	0.31
Endrin aldehyde	PEST	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endrin ketone	PEST	0.49	U	0.49	0.48	U	0.48	0.48	U	0.48	0.50	U	0.50	0.50	U	0.50	0.49	U	0.49	0.48	U	0.48	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.46	U	0.46	0.45	U	0.45	0.46	U	0.46	0.48	U	0.48	0.48	U	0.48	0.46	U	0.46	0.45	U	0.45	0.48	U	0.48
gamma-Chlordane	PEST	0.26	U	0.26	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22
Heptachlor epoxide	PEST	0.42	U	0.42	0.42	U	0.42	0.42	U	0.42	0.44	U	0.44	0.44	U	0.44	0.42	U	0.42	0.42	U	0.42	0.44	U	0.44
Methoxychlor	PEST	0.45	U	0.45	0.44	U	0.44	0.44	U	0.44	0.46	U	0.46	0.46	U	0.46	0.45	U	0.45	0.44	U	0.44	0.46	UN	0.46
Toxaphene	PEST	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16

Attachment 1 Sheet No. 31 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV8 F-7 5/26/11			J1JCV9 F-8 5/26/11			J1JCW0 F-9 5/26/11			J1JCW1 F-10 5/26/11			J1JCW2 F-11 5/26/11			J1JCW3 F-12 5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.7	U	9.7	10	U	10	9.7	U	9.7	9.6	U	9.6	10	U	10	10	U	10
Acenaphthylene	PAH	8.7	U	8.7	9.0	U	9.0	8.8	U	8.8	8.6	U	8.6	9.1	U	9.1	9.0	U	9.0
Anthracene	PAH	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	2.9	U	2.9	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.1	U	3.1	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2	3.2	U	3.2
Benzo(a)pyrene	PAH	6.2	U	6.2	6.4	U	6.4	6.2	U	6.2	6.1	U	6.1	6.5	U	6.5	6.4	U	6.4
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.2	U	4.2	4.1	U	4.1	4.0	U	4.0	4.3	U	4.3	4.2	U	4.2
Benzo(ghi)perylene	PAH	7.0	U	7.0	7.2	U	7.2	7.0	U	7.0	6.9	U	6.9	7.3	U	7.3	7.2	U	7.2
Benzo(k)fluoranthene	PAH	3.8	U	3.8	3.9	U	3.9	3.8	U	3.8	3.8	U	3.8	4.0	U	4.0	4.0	U	4.0
Chrysene	PAH	4.7	U	4.7	4.8	U	4.8	4.7	U	4.7	4.6	U	4.6	4.9	U	4.9	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13	13	U	13
Fluorene	PAH	5.1	U	5.1	5.3	U	5.3	5.1	U	5.1	5.1	U	5.1	5.4	U	5.4	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12
Aldrin	PEST	0.24	U	0.24	0.25	U	0.25	0.24	U	0.24	0.24	U	0.24	0.25	U	0.25	0.26	U	0.26
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20	0.20	U	0.20	0.21	U	0.21	0.22	U	0.22
alpha-Chlordane	PEST	0.31	U	0.31	0.32	U	0.32	0.31	U	0.31	0.30	U	0.30	0.32	U	0.32	0.33	U	0.33
beta-BHC	PEST	0.64	U	0.64	0.66	U	0.66	0.63	U	0.63	0.63	U	0.63	0.65	U	0.65	0.68	U	0.68
Delta-BHC	PEST	0.39	U	0.39	0.40	U	0.40	0.38	U	0.38	0.38	U	0.38	0.39	U	0.39	0.41	U	0.41
4,4'-DDD	PEST	0.53	U	0.53	0.54	U	0.54	0.52	U	0.52	0.51	U	0.51	0.53	U	0.53	0.56	U	0.56
4,4'-DDE	PEST	0.23	U	0.23	0.24	U	0.24	0.22	U	0.22	0.22	U	0.22	0.23	U	0.23	0.24	U	0.24
4,4'-DDT	PEST	0.57	U	0.57	0.59	U	0.59	0.56	U	0.56	0.56	U	0.56	0.58	U	0.58	0.60	U	0.60
Dieldrin	PEST	0.20	U	0.20	0.21	U	0.21	0.20	U	0.20	0.20	U	0.20	0.21	U	0.21	0.21	U	0.21
Endosulfan I	PEST	0.17	U	0.17	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endosulfan II	PEST	0.28	U	0.28	0.29	U	0.29	0.27	U	0.27	0.27	U	0.27	0.28	U	0.28	0.29	U	0.29
Endosulfan sulfate	PEST	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.28	U	0.28
Endrin	PEST	0.29	U	0.29	0.30	U	0.30	0.29	U	0.29	0.29	U	0.29	0.30	U	0.30	0.31	U	0.31
Endrin aldehyde	PEST	0.16	U	0.16	0.17	U	0.17	0.16	U	0.16	0.16	U	0.16	0.17	U	0.17	0.17	U	0.17
Endrin ketone	PEST	0.47	U	0.47	0.49	U	0.49	0.46	U	0.46	0.46	U	0.46	0.48	U	0.48	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.45	U	0.45	0.46	U	0.46	0.44	U	0.44	0.44	U	0.44	0.45	U	0.45	0.47	U	0.47
gamma-Chlordane	PEST	0.26	U	0.26	0.26	U	0.26	0.25	U	0.25	0.25	U	0.25	0.26	U	0.26	0.27	U	0.27
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20	0.20	U	0.20	0.21	U	0.21	0.22	U	0.22
Heptachlor epoxide	PEST	0.41	U	0.41	0.42	U	0.42	0.40	U	0.40	0.40	U	0.40	0.42	U	0.42	0.43	U	0.43
Methoxychlor	PEST	0.43	U	0.43	0.45	U	0.45	0.43	U	0.43	0.42	U	0.42	0.44	U	0.44	0.46	U	0.46
Toxaphene	PEST	15	U	15	16	U	16	15	U	15	15	U	15	15	U	15	16	U	16

Attachment 1 Sheet No. 32 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C0			J1B8C8			J1B8B6			J1B8B7			J1B8B8			J1B8B9			J1B8C1			J1B8C2			J1B8C3		
		D5			Duplicate of J1B8B9			D1			D2			D3			D4			D6			D7			D8		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1221	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1232	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1242	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1248	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	13.2	U	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1254	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	9.43	J	13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
Aroclor-1260	PCB	13.2	U	13.2	14.2	U	14.2	13.4	U	13.4	19.2		13.2	13.3	U	13.3	14.3	U	14.3	13.3	U	13.3	13.3	U	13.3	13.4	U	13.4
1,2,4-Trichlorobenzene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
1,2-Dichlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
1,3-Dichlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
1,4-Dichlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4,5-Trichlorophenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4,6-Trichlorophenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4-Dichlorophenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U·	332
2,4-Dimethylphenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,4-Dinitrophenol	SVOA	1670	UJ	1670	1730	U	1730	1620	UJ	1620	1700	UJ	1700	1650	UJ	1650	1740	UJ	1740	1660	UJ	1660	1660	UJ	1660	1660	UJ	1660
2,4-Dinitrotoluene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2,6-Dinitrotoluene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Chloronaphthalene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Chlorophenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Methylnaphthalene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Methylphenol (cresol, o-)	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
2-Nitroaniline	SVOA	1670	U	1670	1730	UJ	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
2-Nitrophenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
3+4 Methylphenol (cresol, m+p)	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
3,3'-Dichlorobenzidine	SVOA	669	U	669	692	UJ	692	648	U	648	679	U	679	661	U	661	697	U	697	664	U	664	666	U	666	665	U	665
3-Nitroaniline	SVOA	1670	U	1670	1730	U	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
4,6-Dinitro-2-methylphenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Bromophenylphenyl ether	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Chloro-3-methylphenol	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Chloroaniline	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Chlorophenylphenyl ether	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
4-Nitroaniline	SVOA	1670	U	1670	1730	UJ	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
4-Nitrophenol	SVOA	1670	U	1670	1730	UJ	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
Acenaphthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Acenaphthylene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Anthracene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(a)anthracene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(a)pyrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(b)fluoranthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Benzo(ghi)perylene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332

Attachment 1 Sheet No. 33 of 45
Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C4			J1B8C5			J1B8C6			J1B8C7			J1JCT4			J1JCV1			J1JCR9			J1JCT0		
		D9			D10			D11			D12			E-6			Duplicate of J1JCT4			E-1			E-2		
		6/29/10			6/29/10			6/29/10			6/29/10			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2.8	U	2.8	2.8	U	2.8	3.1	U	3.1	2.8	U	2.8
Aroclor-1221	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	8.1	U	8.1	8.1	U	8.1	9.1	U	9.1	8	U	8
Aroclor-1232	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2	U	2	2	U	2	2.3	U	2.3	2	U	2
Aroclor-1242	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	4.7	U	4.7	4.7	U	4.7	5.3	U	5.3	4.7	U	4.7
Aroclor-1248	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	4.7	U	4.7	4.7	U	4.7	5.3	U	5.3	4.7	U	4.7
Aroclor-1254	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2.6	U	2.6	2.6	U	2.6	2.9	U	2.9	2.6	U	2.6
Aroclor-1260	PCB	13.6	U	13.6	13.2	U	13.2	13.5	U	13.5	13.4	U	13.4	2.6	U	2.6	2.6	U	2.6	2.9	U	2.9	2.6	U	2.6
1,2,4-Trichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	29	U	29	27	U	27	31	U	31	27	U	27
1,2-Dichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	24	U	24	21	U	21
1,3-Dichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	12	U	12	12	U	12	13	U	13	12	U	12
1,4-Dichlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	14	U	14	13	U	13	15	U	15	13	U	13
2,4,5-Trichlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2,4-Dichlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2,4-Dimethylphenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	67	U	67	64	U	64	72	U	72	64	U	64
2,4-Dinitrophenol	SVOA	1720	UJ	1720	1640	UJ	1640	1630	UJ	1630	1640	U	1640	340	U	340	320	U	320	370	U	370	320	U	320
2,4-Dinitrotoluene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	67	U	67	64	U	64	72	U	72	64	U	64
2,6-Dinitrotoluene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	29	U	29	27	U	27	31	U	31	27	U	27
2-Chloronaphthalene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
2-Chlorophenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	21	U	21	20	U	20	23	U	23	20	U	20
2-Methylnaphthalene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	19	U	19	18	U	18	21	U	21	19	U	19
2-Methylphenol (cresol, o-)	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	13	U	13	13	U	13	14	U	14	13	U	13
2-Nitroaniline	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	UJ	1640	51	U	51	48	U	48	55	U	55	49	U	49
2-Nitrophenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
3+4 Methylphenol (cresol, m+p)	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	92	U	92	87	U	87	99	U	99	88	U	88
3,3'-Dichlorobenzidine	SVOA	687	U	687	655	U	655	651	U	651	654	UJ	654	34	U	34	32	U	32	36	U	36	32	U	32
3-Nitroaniline	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	U	1640	74	U	74	71	U	71	80	U	80	71	U	71
4,6-Dinitro-2-methylphenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	340	U	340	320	U	320	360	U	360	320	U	320
4-Bromophenylphenyl ether	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	19	U	19	18	U	18	21	U	21	19	U	19
4-Chloro-3-methylphenol	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	67	U	67	64	U	64	72	U	72	64	U	64
4-Chloroaniline	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	83	U	83	79	U	79	90	U	90	80	U	80
4-Chlorophenylphenyl ether	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	21	U	21	20	U	20	23	U	23	20	U	20
4-Nitroaniline	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	UJ	1640	74	U	74	70	U	70	80	U	80	71	U	71
4-Nitrophenol	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	UJ	1640	99	U	99	94	U	94	110	U	110	95	U	95
Acenaphthene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	10	U	10	10	U	10	11	U	11	10	U	10
Acenaphthylene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
Anthracene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
Benzo(a)anthracene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	20	U	20	19	U	19	22	U	22	20	U	20
Benzo(a)pyrene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	20	U	20	19	U	19	22	U	22	20	U	20
Benzo(b)fluoranthene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	27	U	27	25	U	25	29	U	29	26	U	26
Benzo(ghi)perylene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	16	U	16	16	U	16	18	U	18	16	U	16

Attachment	1	Sheet No.	34 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCT1			J1JCT2			J1JCT3			J1JCT5			J1JCT6			J1JCT7			J1JCT8			J1JCT9		
		E-3			E-4			E-5			E-7			E-8			E-9			E-10			E-11		
		5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8.1	U	8.1	8	U	8	7.7	U	7.7	7.9	U	7.9	7.8	U	7.8	8.1	U	8.1	8.2	U	8.2	8.2	U	8.2
Aroclor-1232	PCB	2	U	2	2	U	2	1.9	U	1.9	2	U	2	1.9	U	1.9	2	U	2	2.1	U	2.1	2	U	2
Aroclor-1242	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	4.6	U	4.6	4.5	U	4.5	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8
Aroclor-1248	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	4.6	U	4.6	4.5	U	4.5	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
1,2,4-Trichlorobenzene	SVOA	27	U	27	28	U	28	27	U	27	28	U	28	27	U	27	27	U	27	28	U	28	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	21	U	21	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	14	U	14	13	U	13	13	U	13	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2,4-Dichlorophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2,4-Dimethylphenol	SVOA	64	U	64	66	U	66	63	U	63	66	U	66	64	U	64	65	U	65	67	U	67	67	U	67
2,4-Dinitrophenol	SVOA	330	U	330	330	U	330	320	U	320	330	U	330	320	U	320	330	U	330	340	U	340	340	U	340
2,4-Dinitrotoluene	SVOA	64	U	64	66	U	66	63	U	63	66	U	66	64	U	64	65	U	65	67	U	67	67	U	67
2,6-Dinitrotoluene	SVOA	27	U	27	28	U	28	27	U	27	28	U	28	27	U	27	27	U	27	28	U	28	28	U	28
2-Chloronaphthalene	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	50	U	50	48	U	48	50	U	50	49	U	49	49	U	49	50	U	50	51	U	51
2-Nitrophenol	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	88	U	88	90	U	90	87	U	87	90	U	90	88	U	88	88	U	88	91	U	91	91	U	91
3,3'-Dichlorobenzidine	SVOA	32	U	32	33	U	33	32	U	32	33	U	33	32	U	32	32	U	32	33	U	33	33	U	33
3-Nitroaniline	SVOA	71	U	71	73	U	73	70	U	70	73	U	73	71	U	71	72	U	72	74	U	74	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	330	U	330	320	U	320	330	U	330	320	U	320	320	U	320	330	U	330	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	66	U	66	63	U	63	66	U	66	64	U	64	65	U	65	67	U	67	67	U	67
4-Chloroaniline	SVOA	80	U	80	82	U	82	79	U	79	82	U	82	80	U	80	80	U	80	83	U	83	83	U	83
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
4-Nitroaniline	SVOA	71	U	71	73	U	73	70	U	70	72	U	72	71	U	71	71	U	71	73	U	73	73	U	73
4-Nitrophenol	SVOA	95	U	95	97	U	97	93	U	93	97	U	97	95	U	95	95	U	95	98	U	98	98	U	98
Acenaphthene	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	20	U	20	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	19	U	19	20	U	20	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	25	U	25	26	U	26	26	U	26	26	U	26	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16

Attachment	1	Sheet No.	35 of 45
Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV0			J1JCV3			J1JCW4			J1JCV2			J1JCV4			J1JCV5			J1JCV6			J1JCV7		
		E-12			F-2			Duplicate of J1JCV3			F-1			F-3			F-4			F-5			F-6		
		5/31/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.9	U	2.9	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8	U	8	8	U	8	8.1	U	8.1	8.2	U	8.2	8.3	U	8.3	8.2	U	8.2	8.2	U	8.2	8	U	8
Aroclor-1232	PCB	2	U	2	2	U	2	2	U	2	2	U	2	2.1	U	2.1	2	U	2	2.1	U	2.1	2	U	2
Aroclor-1242	PCB	4.6	U	4.6	4.6	U	4.6	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6
Aroclor-1248	PCB	4.6	U	4.6	4.6	U	4.6	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
1,2,4-Trichlorobenzene	SVOA	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	30	U	30	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2,4-Dimethylphenol	SVOA	65	U	65	68	U	68	66	U	66	66	U	66	69	U	69	70	U	70	65	U	65	67	U	67
2,4-Dinitrophenol	SVOA	330	U	330	340	U	340	340	U	340	330	U	330	350	U	350	350	U	350	330	U	330	340	U	340
2,4-Dinitrotoluene	SVOA	65	U	65	68	U	68	66	U	66	66	U	66	69	U	69	70	U	70	65	U	65	67	U	67
2,6-Dinitrotoluene	SVOA	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	30	U	30	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
2-Chlorophenol	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14	14	U	14	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	52	U	52	50	U	50	50	U	50	52	U	52	53	U	53	49	U	49	50	U	50
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	89	U	89	93	U	93	91	U	91	90	U	90	94	U	94	95	U	95	88	U	88	91	U	91
3,3'-Dichlorobenzidine	SVOA	33	U	33	34	U	34	33	U	33	33	U	33	34	U	34	35	U	35	32	U	32	33	U	33
3-Nitroaniline	SVOA	72	U	72	75	U	75	73	U	73	73	U	73	76	U	76	77	U	77	71	U	71	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	340	U	340	330	U	330	330	U	330	340	U	340	350	U	350	320	U	320	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	68	U	68	66	U	66	66	U	66	69	U	69	70	U	70	65	U	65	67	U	67
4-Chloroaniline	SVOA	81	U	81	85	U	85	82	U	82	82	U	82	85	U	85	87	U	87	80	U	80	83	U	83
4-Chlorophenylphenyl ether	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
4-Nitroaniline	SVOA	72	U	72	75	U	75	73	U	73	73	U	73	75	U	75	77	U	77	71	U	71	73	U	73
4-Nitrophenol	SVOA	96	U	96	100	U	100	98	U	98	97	U	97	100	U	100	100	U	100	95	U	95	98	U	98
Acenaphthene	SVOA	10	U	10	11	U	11	10	U	10	10	U	10	11	U	11	11	U	11	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	27	U	27	26	U	26	26	U	26	27	U	27	28	U	28	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17	16	U	16	16	U	16

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Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCV8			J1JCV9			J1JCW0			J1JCW1			J1JCW2			J1JCW3		
		F-7			F-8			F-9			F-10			F-11			F-12		
		5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8	2.6	U	2.6	2.8	U	2.8
Aroclor-1221	PCB	8.2	U	8.2	8.2	U	8.2	7.9	U	7.9	8.2	U	8.2	7.6	U	7.6	8.2	U	8.2
Aroclor-1232	PCB	2	U	2	2	U	2	2	U	2	2	U	2	1.9	U	1.9	2	U	2
Aroclor-1242	PCB	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6	4.8	U	4.8	4.4	U	4.4	4.8	U	4.8
Aroclor-1248	PCB	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6	4.8	U	4.8	4.4	U	4.4	4.8	U	4.8
Aroclor-1254	PCB	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7	2.5	U	2.5	2.7	U	2.7
Aroclor-1260	PCB	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7	2.5	U	2.5	2.7	U	2.7
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	14	U	14	13	U	13	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2,4-Dichlorophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2,4-Dimethylphenol	SVOA	65	U	65	65	U	65	66	U	66	64	U	64	63	U	63	66	U	66
2,4-Dinitrophenol	SVOA	330	U	330	330	U	330	330	U	330	320	U	320	320	U	320	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65	65	U	65	66	U	66	64	U	64	63	U	63	66	U	66
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
2-Chlorophenol	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13
2-Nitroaniline	SVOA	49	U	49	49	U	49	50	U	50	48	U	48	48	U	48	50	U	50
2-Nitrophenol	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
3+4 Methylphenol (cresol, m+p)	SVOA	88	U	88	89	U	89	90	U	90	87	U	87	86	U	86	90	U	90
3,3'-Dichlorobenzidine	SVOA	32	U	32	32	U	32	33	U	33	32	U	32	31	U	31	33	U	33
3-Nitroaniline	SVOA	72	U	72	72	U	72	73	U	73	71	U	71	69	U	69	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	330	U	330	320	U	320	310	U	310	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	65	U	65	66	U	66	64	U	64	63	U	63	66	U	66
4-Chloroaniline	SVOA	81	U	81	81	U	81	82	U	82	79	U	79	78	U	78	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
4-Nitroaniline	SVOA	71	U	71	71	U	71	72	U	72	70	U	70	69	U	69	72	U	72
4-Nitrophenol	SVOA	95	U	95	95	U	95	97	U	97	94	U	94	92	U	92	96	U	96
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	20	U	20	19	U	19	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	20	U	20	19	U	19	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	26	U	26	25	U	25	25	U	25	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16

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Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1B8C0			J1B8C8			J1B8B6			J1B8B7			J1B8B8			J1B8B9			J1B8C1			J1B8C2			J1B8C3		
		D5			Duplicate of J1B8B9			D1			D2			D3			D4			D6			D7			D8		
		6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10			6/29/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-chloro-1-methylethyl)ether	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-Chloroethoxy)methane	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-chloroethyl) ether	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Bis(2-ethylhexyl) phthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Butylbenzylphthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Carbazole	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Chrysene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Di-n-butylphthalate	SVOA	334	UJ	334	346	UJ	346	324	UJ	324	339	UJ	339	330	UJ	330	349	UJ	349	332	UJ	332	333	UJ	333	332	UJ	332
Di-n-octylphthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Dibenz[a,h]anthracene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Dibenzofuran	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Diethyl phthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Dimethyl phthalate	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Fluoranthene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Fluorene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachlorobenzene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachlorobutadiene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachlorocyclopentadiene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Hexachloroethane	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Indeno(1,2,3-cd)pyrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Isophorone	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
N-Nitroso-di-n-dipropylamine	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
N-Nitrosodiphenylamine	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Naphthalene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Nitrobenzene	SVOA	334	U	334	346	U	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Pentachlorophenol	SVOA	1670	U	1670	1730	U	1730	1620	U	1620	1700	U	1700	1650	U	1650	1740	U	1740	1660	U	1660	1660	U	1660	1660	U	1660
Phenanthrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Phenol	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332
Pyrene	SVOA	334	U	334	346	UJ	346	324	U	324	339	U	339	330	U	330	349	U	349	332	U	332	333	U	333	332	U	332

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Originator T. E. Queen Date 7/13/11
Checked J. D. Skoglie Date 7/13/11
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Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1B8C4			J1B8C5			J1B8C6			J1B8C7			J1JCT4			J1JCV1			J1JCR9			J1JCT0		
		D9			D10			D11			D12			E-6			Duplicate of J1JCT4			E-1			E-2		
		6/29/10			6/29/10			6/29/10			6/29/10			5/31/11			5/31/11			5/31/11			5/31/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	41	U	41	39	U	39	44	U	44	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	23	U	23	22	U	22	25	U	25	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	23	U	23	22	U	22	25	U	25	22	U	22
Bis(2-chloroethyl) ether	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	18	U	18	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	76	JB	47	66	JB	45	51	U	51	45	U	45
Butylbenzylphthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	44	U	44	42	U	42	47	U	47	42	U	42
Carbazole	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	37	U	37	35	U	35	40	U	40	35	U	35
Chrysene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	27	U	27	26	U	26	30	U	30	26	U	26
Di-n-butylphthalate	SVOA	343	UJ	343	327	UJ	327	325	UJ	325	327	UJ	327	19	U	19	18	U	18	21	U	21	19	U	19
Di-n-octylphthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	20	U	20	19	U	19	22	U	22	20	U	20
Dibenz[a,h]anthracene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	26	U	26	25	U	25	29	U	29	25	U	25
Dibenzofuran	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	23	U	23	22	U	22	25	U	25	22	U	22
Diethyl phthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	30	U	30	28	U	28	32	U	32	28	U	28
Dimethyl phthalate	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	15	U	15	14	U	14	16	U	16	14	U	14
Fluoranthene	SVOA	343	U	343	93.6	J	327	325	U	325	327	UJ	327	37	U	37	35	U	35	40	U	40	35	U	35
Fluorene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	18	U	18	17	U	17	20	U	20	18	U	18
Hexachlorobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	30	U	30	28	U	28	32	U	32	28	U	28
Hexachlorobutadiene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	10	U	10	9.7	U	9.7	11	U	11	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	51	U	51	48	U	48	55	U	55	49	U	49
Hexachloroethane	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	23	U	23	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	24	U	24	21	U	21
Isophorone	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	32	U	32	30	U	30	34	U	34	30	U	30
N-Nitrosodiphenylamine	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	22	U	22	21	U	21	24	U	24	21	U	21
Naphthalene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	32	U	32	30	U	30	34	U	34	30	U	30
Nitrobenzene	SVOA	343	U	343	327	U	327	325	U	325	327	U	327	21	U	21	20	U	20	23	U	23	20	U	20
Pentachlorophenol	SVOA	1720	U	1720	1640	U	1640	1630	U	1630	1640	U	1640	340	U	340	320	U	320	360	U	360	320	U	320
Phenanthrene	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	17	U	17	16	U	16	19	U	19	17	U	17
Phenol	SVOA	343	U	343	327	U	327	325	U	325	327	UJ	327	18	U	18	17	U	17	20	U	20	18	U	18
Pyrene	SVOA	343	U	343	99.5	J	327	325	U	325	327	UJ	327	12	U	12	12	U	12	13	U	13	12	U	12

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Checked	J. D. Skoglie	Date	7/13/11
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Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

CONSTITUENT	CLASS	J1JCT1			J1JCT2			J1JCT3			J1JCT5			J1JCT6			J1JCT7			J1JCT8			J1JCT9		
		E-3			E-4			E-5			E-7			E-8			E-9			E-10			E-11		
		5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11			5/31/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	39	U	39	40	U	40	38	U	38	40	U	40	39	U	39	39	U	39	40	U	40	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	22	U	22	23	U	23	22	U	22	23	U	23	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	22	U	22	23	U	23	22	U	22	23	U	23	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	16	U	16	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	76	JB	45	74	JB	46	70	JB	44	77	JB	46	74	JB	45	75	JB	45	69	JB	46	74	JB	46
Butylbenzylphthalate	SVOA	42	U	42	43	U	43	41	U	41	43	U	43	42	U	42	42	U	42	43	U	43	43	U	43
Carbazole	SVOA	35	U	35	36	U	36	35	U	35	36	U	36	35	U	35	35	U	35	36	U	36	36	U	36
Chrysene	SVOA	26	U	26	27	U	27	26	U	26	27	U	27	26	U	26	27	U	27	27	U	27	27	U	27
Di-n-butylphthalate	SVOA	19	U	19	19	U	19	18	U	18	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
Di-n-octylphthalate	SVOA	20	U	20	20	U	20	19	U	19	20	U	20	19	U	19	20	U	20	20	U	20	20	U	20
Dibenz[a,h]anthracene	SVOA	25	U	25	26	U	26	25	U	25	26	U	26	25	U	25	26	U	26	26	U	26	26	U	26
Dibenzofuran	SVOA	22	U	22	23	U	23	22	U	22	23	U	23	22	U	22	23	U	23	23	U	23	23	U	23
Diethyl phthalate	SVOA	28	U	28	29	U	29	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	29	U	29
Dimethyl phthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15
Fluoranthene	SVOA	35	U	35	36	U	36	35	U	35	36	U	36	35	U	35	35	U	35	36	U	36	36	U	36
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	28	U	28	29	U	29	28	U	28	29	U	29	28	U	28	28	U	28	29	U	29	29	U	29
Hexachlorobutadiene	SVOA	9.8	U	9.8	10	U	10	9.6	U	9.6	10	U	10	9.7	U	9.7	9.8	U	9.8	10	U	10	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	50	U	50	48	U	48	50	U	50	49	U	49	49	U	49	50	U	50	51	U	51
Hexachloroethane	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	21	U	21	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	31	U	31	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	22	U	22	21	U	21	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Naphthalene	SVOA	30	U	30	31	U	31	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31	31	U	31
Nitrobenzene	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
Pentachlorophenol	SVOA	320	U	320	330	U	330	320	U	320	330	U	330	320	U	320	320	U	320	330	U	330	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Phenol	SVOA	18	U	18	18	U	18	17	U	17	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	16	J	12	12	U	12

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Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Organics)

		J1JCV0			J1JCV3			J1JCW4			J1JCV2			J1JCV4			J1JCV5			J1JCV6			J1JCV7		
		E-12			F-2			Duplicate of J1JCV3			F-1			F-3			F-4			F-5			F-6		
		5/31/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
CONSTITUENT	CLASS	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	40	U	40	41	U	41	40	U	40	40	U	40	42	U	42	42	U	42	39	U	39	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	72	JB	45	47	U	47	76	JB	46	46	U	46	77	JB	48	74	JB	49	71	JB	45	73	JB	46
Butylbenzylphthalate	SVOA	42	U	42	44	U	44	43	U	43	43	U	43	45	U	45	45	U	45	42	U	42	43	U	43
Carbazole	SVOA	36	U	36	37	U	37	36	U	36	36	U	36	37	U	37	38	U	38	35	U	35	36	U	36
Chrysene	SVOA	27	U	27	28	U	28	27	U	27	27	U	27	28	U	28	29	U	29	26	U	26	27	U	27
Di-n-butylphthalate	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19	19	U	19
Di-n-octylphthalate	SVOA	20	U	20	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20	20	U	20
Dibenz[a,h]anthracene	SVOA	26	U	26	35	JB	27	26	U	26	31	JB	26	27	U	27	29	JB	27	25	U	25	26	U	26
Dibenzofuran	SVOA	23	U	23	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24	23	U	23	23	U	23
Diethyl phthalate	SVOA	29	U	29	30	U	30	29	U	29	29	U	29	30	U	30	31	U	31	28	U	28	29	U	29
Dimethyl phthalate	SVOA	14	U	14	15	U	15	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	15	U	15
Fluoranthene	SVOA	36	U	36	37	U	37	36	U	36	36	U	36	37	U	37	38	U	38	35	U	35	36	U	36
Fluorene	SVOA	18	U	18	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18	18	U	18
Hexachlorobenzene	SVOA	29	U	29	30	U	30	29	U	29	29	U	29	30	U	30	31	U	31	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11	9.8	U	9.8	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	52	U	52	50	U	50	50	U	50	52	U	52	53	U	53	49	U	49	50	U	50
Hexachloroethane	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	23	U	23	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	32	U	32	31	U	31	31	U	31	32	U	32	33	U	33	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	22	U	22	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Naphthalene	SVOA	31	U	31	32	U	32	31	U	31	31	U	31	32	U	32	33	U	33	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
Pentachlorophenol	SVOA	330	U	330	340	U	340	330	U	330	330	U	330	340	U	340	350	U	350	320	U	320	330	U	330
Phenanthrene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17	17	U	17
Phenol	SVOA	18	U	18	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13	13	U	13	12	U	12	12	U	12

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Checked J. D. Skoglie Date 7/13/11
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CONSTITUENT	CLASS	J1JCV8			J1JCV9			J1JCW0			J1JCW1			J1JCW2			J1JCW3		
		F-7			F-8			F-9			F-10			F-11			F-12		
		5/26/11			5/26/11			5/26/11			5/26/11			5/26/11			5/26/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	40	U	40	39	U	39	38	U	38	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	17	U	17	16	U	16	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	66	JB	45	45	U	45	46	U	46	45	U	45	44	U	44	46	U	46
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	43	U	43	42	U	42	41	U	41	43	U	43
Carbazole	SVOA	35	U	35	35	U	35	36	U	36	35	U	35	34	U	34	36	U	36
Chrysene	SVOA	27	U	27	27	U	27	27	U	27	26	U	26	26	U	26	27	U	27
Di-n-butylphthalate	SVOA	19	U	19	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
Di-n-octylphthalate	SVOA	20	U	20	20	U	20	20	U	20	19	U	19	19	U	19	20	U	20
Dibenz[a,h]anthracene	SVOA	26	U	26	26	U	26	26	U	26	25	U	25	25	U	25	26	U	26
Dibenzofuran	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Diethyl phthalate	SVOA	29	U	29	29	U	29	29	U	29	28	U	28	28	U	28	29	U	29
Dimethyl phthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Fluoranthene	SVOA	35	U	35	35	U	35	36	U	36	35	U	35	34	U	34	36	U	36
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	17	U	17	17	U	17	18	U	18
Hexachlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.8	U	9.8	9.8	U	9.8	10	U	10	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	50	U	50	48	U	48	48	U	48	50	U	50
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	20	U	20	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
Naphthalene	SVOA	30	U	30	30	U	30	31	U	31	30	U	30	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
Pentachlorophenol	SVOA	320	U	320	320	U	320	330	U	330	320	U	320	310	U	310	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Phenol	SVOA	18	U	18	18	U	18	18	U	18	17	U	17	17	U	17	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12

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Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Equipment blanks)

CONSTITUENT	CLASS	J1JCW5 Equipment blank 5/26/11			J1B853 Equipment blank 6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.4	U	9.4	3.15	U	3.15
Acenaphthylene	PAH	8.5	U	8.5	3.15	U	3.15
Anthracene	PAH	2.9	U	2.9	3.15	U	3.15
Benzo(a)anthracene	PAH	3.0	U	3.0	3.15	U	3.15
Benzo(a)pyrene	PAH	6.0	U	6.0	3.15	U	3.15
Benzo(b)fluoranthene	PAH	4.0	U	4.0	3.15	U	3.15
Benzo(ghi)perylene	PAH	6.8	U	6.8	3.15	U	3.15
Benzo(k)fluoranthene	PAH	3.7	U	3.7	3.15	U	3.15
Chrysene	PAH	4.6	U	4.6	3.15	U	3.15
Dibenz[a,h]anthracene	PAH	10	U	10	3.15	U	3.15
Fluoranthene	PAH	12	U	12	3.15	U	3.15
Fluorene	PAH	5.0	U	5.0	3.15	U	3.15
Indeno(1,2,3-cd)pyrene	PAH	11	U	11	3.15	U	3.15
Naphthalene	PAH	11	U	11	3.15	U	3.15
Phenanthrene	PAH	11	U	11	3.15	U	3.15
Pyrene	PAH	11	U	11	3.15	U	3.15
Aldrin	PEST						
Alpha-BHC	PEST						
alpha-Chlordane	PEST						
beta-BHC	PEST						
Delta-BHC	PEST						
4,4'-DDD	PEST						
4,4'-DDE	PEST						
4,4'-DDT	PEST						
Dieldrin	PEST						
Endosulfan I	PEST						
Endosulfan II	PEST						
Endosulfan sulfate	PEST						
Endrin	PEST						
Endrin aldehyde	PEST						
Endrin ketone	PEST						
Gamma-BHC (Lindane)	PEST						
gamma-Chlordane	PEST						
Heptachlor	PEST						
Heptachlor epoxide	PEST						
Methoxychlor	PEST						
Toxaphene	PEST						

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Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Equipment blanks)

CONSTITUENT	CLASS	J1JCW5 Equipment blank 5/26/11			J1B853 Equipment blank 6/30/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.6	U	2.6	13.2	U	13.2
Aroclor-1221	PCB	7.4	U	7.4	13.2	U	13.2
Aroclor-1232	PCB	1.8	U	1.8	13.2	U	13.2
Aroclor-1242	PCB	4.3	U	4.3	13.2	U	13.2
Aroclor-1248	PCB	4.3	U	4.3	13.2	U	13.2
Aroclor-1254	PCB	2.4	U	2.4	13.2	U	13.2
Aroclor-1260	PCB	2.4	U	2.4	13.2	U	13.2
1,2,4-Trichlorobenzene	SVOA	26	U	26	330	U	330
1,2-Dichlorobenzene	SVOA	20	U	20	330	U	330
1,3-Dichlorobenzene	SVOA	11	U	11	330	U	330
1,4-Dichlorobenzene	SVOA	13	U	13	330	U	330
2,4,5-Trichlorophenol	SVOA	9.2	U	9.2	330	U	330
2,4,6-Trichlorophenol	SVOA	9.2	U	9.2	330	U	330
2,4-Dichlorophenol	SVOA	9.2	U	9.2	330	U	330
2,4-Dimethylphenol	SVOA	61	U	61	330	U	330
2,4-Dinitrophenol	SVOA	310	U	310	1650	U	1650
2,4-Dinitrotoluene	SVOA	61	U	61	330	U	330
2,6-Dinitrotoluene	SVOA	26	U	26	330	U	330
2-Chloronaphthalene	SVOA	9.2	U	9.2	330	U	330
2-Chlorophenol	SVOA	19	U	19	330	U	330
2-Methylnaphthalene	SVOA	18	U	18	330	U	330
2-Methylphenol (cresol, o-)	SVOA	12	U	12	330	U	330
2-Nitroaniline	SVOA	46	U	46	1650	U	1650
2-Nitrophenol	SVOA	9.2	U	9.2	330	U	330
3+4 Methylphenol (cresol, m+p)	SVOA	83	U	83	330	U	330
3,3'-Dichlorobenzidine	SVOA	30	U	30	660	U	660
3-Nitroaniline	SVOA	67	U	67	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	300	U	300	330	U	330
4-Bromophenylphenyl ether	SVOA	18	U	18	330	U	330
4-Chloro-3-methylphenol	SVOA	61	U	61	330	U	330
4-Chloroaniline	SVOA	76	U	76	330	U	330
4-Chlorophenylphenyl ether	SVOA	19	U	19	330	U	330
4-Nitroaniline	SVOA	67	U	67	1650	U	1650
4-Nitrophenol	SVOA	90	U	90	1650	U	1650
Acenaphthene	SVOA	9.5	U	9.5	330	U	330
Acenaphthylene	SVOA	16	U	16	330	U	330
Anthracene	SVOA	16	U	16	330	U	330
Benzo(a)anthracene	SVOA	18	U	18	330	U	330
Benzo(a)pyrene	SVOA	18	U	18	330	U	330
Benzo(b)fluoranthene	SVOA	24	U	24	330	U	330
Benzo(ghi)perylene	SVOA	15	U	15	330	U	330

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Originator T. E. Queen Date 7/13/11
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Calc. No. 0100H-CA-V0178 Rev. No. 0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Equipment blanks)

CONSTITUENT	CLASS	J1JCW5 Equipment blank 5/26/11 ug/kg	Q	PQL	J1B853 Equipment blank 6/30/10 ug/kg	Q	PQL
Benzo(k)fluoranthene	SVOA	37	U	37	330	U	330
Bis(2-chloro-1-methylethyl)ether	SVOA	21	U	21	330	U	330
Bis(2-Chloroethoxy)methane	SVOA	21	U	21	330	U	330
Bis(2-chloroethyl) ether	SVOA	15	U	15	330	U	330
Bis(2-ethylhexyl) phthalate	SVOA	68	JB	42	330	U	330
Butylbenzylphthalate	SVOA	40	U	40	330	U	330
Carbazole	SVOA	33	U	33	330	U	330
Chrysene	SVOA	25	U	25	330	U	330
Di-n-butylphthalate	SVOA	18	U	18	330	U	330
Di-n-octylphthalate	SVOA	18	U	18	330	U	330
Dibenz[a,h]anthracene	SVOA	24	JB	24	330	U	330
Dibenzofuran	SVOA	21	U	21	330	U	330
Diethyl phthalate	SVOA	27	U	27	330	U	330
Dimethyl phthalate	SVOA	13	U	13	330	U	330
Fluoranthene	SVOA	33	U	33	330	U	330
Fluorene	SVOA	17	U	17	330	U	330
Hexachlorobenzene	SVOA	27	U	27	330	U	330
Hexachlorobutadiene	SVOA	9.2	U	9.2	330	U	330
Hexachlorocyclopentadiene	SVOA	46	U	46	330	U	330
Hexachloroethane	SVOA	20	U	20	330	U	330
Indeno(1,2,3-cd)pyrene	SVOA	20	U	20	330	U	330
Isophorone	SVOA	16	U	16	330	U	330
N-Nitroso-di-n-dipropylamine	SVOA	29	U	29	330	U	330
N-Nitrosodiphenylamine	SVOA	20	U	20	330	U	330
Naphthalene	SVOA	29	U	29	330	U	330
Nitrobenzene	SVOA	19	U	19	330	U	330
Pentachlorophenol	SVOA	300	U	300	1650	U	1650
Phenanthrene	SVOA	16	U	16	330	U	330
Phenol	SVOA	17	U	17	330	U	330
Pyrene	SVOA	11	U	11	330	U	330

Attachment	1	Sheet No.	45 of 45
Originator	T. E. Queen	Date	7/13/11
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Calc. No.	0100H-CA-V0178	Rev. No.	0

Attachment 1. 128-H-1 Waste Site Verification Sample Results. (Asbestos)

Sample location	HEIS Number	Sample Date	% Total Asbestos	Sample location	HEIS Number	Sample Date	% Total Asbestos
A3	J1B869	6/30/10	ND	D5	J1B8K2	6/29/10	ND
Duplicate of J1B856		6/30/10	ND	Duplicate of J1B8C0	J1B8L0	6/29/10	ND
A1	J1B867	6/30/10	ND	D1	J1B8J8	6/29/10	ND
A2	J1B868	6/30/10	ND	D2	J1B8J9	6/29/10	ND
A4	J1B870	6/30/10	ND	D3	J1B8K0	6/29/10	ND
A5	J1B871	6/30/10	ND	D4	J1B8K1	6/29/10	ND
A6	J1B872	6/30/10	ND	D6	J1B8K3	6/29/10	ND
A7	J1B873	6/30/10	ND	D7	J1B8K4	6/29/10	ND
A8	J1B874	6/30/10	ND	D8	J1B8K5	6/29/10	ND
A9	J1B875	6/30/10	ND	D9	J1B8K6	6/29/10	ND
A-9[a]	J1JVX3	6/16/11	ND	D10	J1B8K7	6/29/10	ND
A10	J1B876	6/30/10	ND	D11	J1B8K8	6/29/10	ND
A11	J1B877	6/30/10	ND	D12	J1B8K9	6/29/10	ND
A12	J1B879	6/30/10	ND	E-6	J1JCX1	5/31/11	ND
B8	J1B8F9	6/29/10	ND	Duplicate of J1JCT4	J1JCX8	5/31/11	ND
Duplicate of J1B887	J1B8H4	6/29/10	ND	E-1	J1JCW6	5/31/11	ND
B1	J1B8F2	6/29/10	ND	E-2	J1JCW7	5/31/11	ND
B2	J1B8F3	6/29/10	ND	E-3	J1JCW8	5/31/11	ND
B3	J1B8F4	6/29/10	ND	E-4	J1JCW9	5/31/11	ND
B4	J1B8F5	6/29/10	ND	E-5	J1JCX0	5/31/11	ND
B13[b]	J1B8F6	6/29/10	ND	E-7	J1JCX2	5/31/11	ND
B6	J1B8F7	6/29/10	ND	E-8	J1JCX3	5/31/11	ND
B7	J1B8F8	6/29/10	ND	E-9	J1JCX4	5/31/11	ND
B9	J1B8H0	6/29/10	ND	E-10	J1JCX5	5/31/11	ND
B10	J1B8H1	6/29/10	ND	E-11	J1JCX6	5/31/11	ND
B11	J1B8H2	6/29/10	ND	E-12	J1JCX7	5/31/11	ND
B12	J1B8H3	6/29/10	ND	F-2	J1JD00	5/26/11	ND
C8	J1B8J2	6/29/10	ND	Duplicate of J1JCV3	J1JD11	5/26/11	ND
Duplicate of J1B8B0	J1B8J7	6/29/10	ND	F-1	J1JCX9	5/26/11	ND
C1	J1B8H5	6/17/10	ND	F-3	J1JD01	5/26/11	ND
C2	J1B8H6	6/17/10	ND	F-4	J1JD02	5/26/11	ND
C3	J1B8H7	6/17/10	ND	F-5	J1JD03	5/26/11	ND
C4	J1B8H8	6/17/10	ND	F-6	J1JD04	5/26/11	ND
C5	J1B8H9	6/17/10	ND	F-7	J1JD05	5/26/11	ND
C6	J1B8J3	6/17/10	ND	F-8	J1JD06	5/26/11	ND
C7	J1B8J1	6/29/10	ND	F-9	J1JD07	5/26/11	ND
C9	J1B8J0	6/29/10	ND	F-10	J1JD08	5/26/11	ND
C10	J1B8J4	6/29/10	ND	F-11	J1JD09	5/26/11	ND
C11	J1B8J5	6/29/10	ND	F-12	J1JD10	5/26/11	ND
C12	J1B8J6	6/29/10	ND	Equipment blank	J1B853	6/30/10	
				Equipment blank	J1JCW5	5/26/11	

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Originator	T. E. Queen	Date	7/13/11
Checked	J. D. Skoglie	Date	7/13/11
Calc. No.	0100H-CA-V0178	Rev. No.	0

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental Calculation No: 0100H-CA-V0177

Subject: 128-H-1 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 4 Total = 5	T. E. Queen TEQueen	J. D. Skoglie [signature]	B. L. Vedder BLVedder	D. F. Obenauer [signature]	7/26/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007)

DE01-437.03

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100X-CA-V01[illegible]7	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 128-H-1 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009a), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2009a, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2009b, *100 Area Remedial Action Sampling and Analysis Plan,* DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

4) WCH, 2011, *Remaining Sites Verification Package for the 128-H-1, 100-H Burning Pit,* Attachment to Waste Site Reclassification Form 2010-062, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the individual HQ of <1.0 (DOE-RL 2009a).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the excess cancer risk of $<1 \times 10^{-6}$ (DOE-RL 2009a).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

METHODOLOGY:

The 128-H-1 waste site is comprised of six decision units for verification sampling. The direct contact hazard quotient and carcinogenic risk calculations for the 128-H-1 waste site were conservatively

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100X-CA-V0177	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 4	

calculated for the entire waste site using the greater of the statistical and maximum verification soil sample results (WCH 2011). Of the contaminants of potential concern (COPCs) for this site, boron, hexavalent chromium, molybdenum, bis(2-ethylhexyl)phthalate, the detected polycyclic aromatic hydrocarbons, the detected pesticides, and the detected polychlorinated biphenyls require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Lead is not included in the calculation based on modeling of child blood levels, which is fundamentally different from the oral-reference dose and cancer slope factors used to calculate typical cleanup levels and associated HQs and cancer risks. Although total petroleum hydrocarbons (diesel range) were detected and no background value is available, the risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation. Additionally, arsenic was detected above background; however, the arsenic standard is not toxicity based. All other site nonradionuclide COPCs were not detected or were quantified below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the maximum value for boron is 5.07 mg/kg, divided by the noncarcinogenic RAG value of 7,200 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is 7.0×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation. The sum of the HQ values is 1.2×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1.0×10^{-6}. For example, the maximum value for benzo(a)pyrene is 0.0563 mg/kg, divided by 0.137 mg/kg, and multiplied as indicated, is 4.1×10^{-7}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual cancer risk values prior to rounding are used for this calculation. The sum of the excess cancer risk values is 9.9×10^{-7}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None
4) List the cumulative excess cancer risk for carcinogens $>1 \times 10^{-5}$: None

Table 1 shows the results of the hazard quotient and excess cancer risk calculations.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100X-CA-V0177	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 4	

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 128-H-1 Waste Site. (2 pages)

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Arsenic[c]	65.3	20	--	--	--
Boron	5.07	7,200	7.0E-04	--	--
Chromium, hexavalent[d]	0.917	240	3.8E-03	2.1	4.4E-07
Lead[e]	304	353	--	--	--
Molybdenum	0.49	400	1.2E-03	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.144	1,600	9.0E-05	71.4	2.0E-09
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.0682	4,800	1.4E-05	--	--
Acenaphthylene[f]	0.0662	4,800	1.4E-05	--	--
Anthracene	0.00354	24,000	1.5E-07	--	--
Benzo(a)anthracene	0.0553	--	--	1.37	4.0E-08
Benzo(a)pyrene	0.0563	--	--	0.137	4.1E-07
Benzo(b)fluoranthene	0.0524	--	--	1.37	3.8E-08
Benzo(ghi)perylene[f]	0.0421	2,400	1.8E-05	--	--
Benzo(k)fluoranthene	0.0235	--	--	1.37	1.7E-08
Chrysene	0.0652	--	--	13.7	4.8E-09
Dibenz(a,h)anthracene	0.0186	--	--	1.37	1.4E-08
Fluoranthene	0.561	3,200	1.8E-04	--	--
Fluorene	0.0118	3,200	3.7E-06	--	--
Indeno(1,2,3-cd)pyrene	0.0378	--	--	1.37	2.8E-08
Naphthalene	0.00657	1,600	4.1E-06	--	--
Phenanthrene[f]	0.0598	24,000	2.5E-06	--	--
Pyrene	0.187	2,400	7.8E-05	--	--

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100X-CA-V0177	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 4 of 4	

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 128-H-1 Waste Site. (2 pages)

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Pesticides					
DDE, 4,4'-	0.00290	--	--	2.94	9.9E-10
Endosulfan (I, II, sulfate)	0.00129	480	2.7E-06	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.00943	1.6	5.9E-03	0.5	1.9E-08
Aroclor-1260	0.0192	--	--	0.5	3.8E-08
Total Petroleum Hydrocarbons					
Diesel range [g,h]	160	200	--	--	--
Motor oil [g,h]	85.4	200	--	--	--
Totals					
Cumulative Hazard Quotient:			**1.2E-02**		
Cumulative Excess Cancer Risk:					**9.9E-07**

[a] = From WCH (2011).

[b] = Value obtained from the RDR/RAWP (DOE-RL 2009a) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009a). The arsenic standard is not toxicity based, therefore, the hazard quotient will not be calculated.

[d] = Value for the carcinogenic RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.

[e] = Value for the noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[f] = Toxicity data for these chemicals are not available. RAGs fare based on surrogate chemicals.

Contaminant: acenapthylene; surrogate: acenapthene, benzo(ghi)perylene, surrogate: pyrene, phenanthrene; surrogate: anthracene

[g] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

[h] = Diesel range extended results have been excluded because they are representative of only a single sample in the statistical set.

-- = not applicable RAG = remedial action goal

CONCLUSION:

The calculations in Table 1 demonstrates that the 128-H-1 waste site meets the requirements for the direct contact hazard quotients and carcinogenic (excess cancer) risk, respectively, as identified in the RDR/RAWP (DOE-RL 2009a) and SAP (DOE-RL 2009b). The direct contact hazard quotients and carcinogenic (excess cancer) risk calculations are for use in the RSVP for this site.

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CALCULATION COVER SHEET

Project Title: 100-H Area Field Remediation Job No. 14655

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0176

Subject: 128-H-1 Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 4 Total = 5	T. E. Queen TEQueen	J. D. Skoglie JD Skoglie	B. L. Vedder BL Vedder	D. F. Obenauer DF Obenauer	7/26/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100H-CA-V0176	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and excess carcinogenic risk associated with soil contaminant levels compared to soil cleanup levels for protection of groundwater for the 128-H-1 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens.
2) A cumulative HQ of <1.0 for noncarcinogens.
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

3) WCH, 2011, *128-H-1 Waste Site Cleanup Verification 95% UCL Calculations*, 0100H-CA-V0178, Rev. 0, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate a HQ for each noncarcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (DOE-RL 2009).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (DOE-RL 2009).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100H-CA-V0116	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 2 of 4	

METHODOLOGY:

The 128-H-1 waste site was divided into six decision units for the purpose of verification sampling. Hazard quotient and carcinogenic risk calculations for potential impact to groundwater at the 128-H-1 waste site were conservatively calculated for the entire waste site using the statistical or maximum value for each analyte in all decision units from the 95% UCL calculation (WCH 2011). Boron, hexavalent chromium, molybdenum, the detected polycyclic aromatic hydrocarbons (with distribution coefficients less than 80 mL/g), Endosulfan I, and aroclor-1254 are included because they do not have a Hanford Site-specific or Washington State background value available and their respective distribution coefficient is less than necessary to show no migration to groundwater in 1,000 years using the generic site RESRAD model (DOE-RL 2009). Based on this model and a vadose zone of approximately 0.0 m (0.0 ft) thickness, a K_d value of 80 mL/g is adequate to show no predicted risk to groundwater in 1,000 years. Contaminants with a K_d of 80 mL/g are highly adsorbed to soil particles, and even when immersed in water, any migration will be negligible. Therefore, HQ and risk calculations were performed with the exclusion of these analytes with a K_d over 80 mL/g. Aroclor-1254 is included in the calculation because its K_d (75.6) does not allow for the exclusion from this site. However, the only detected aroclor-1254 was in the shallow excavation (Area D), the staging pile area, and the overburden stockpile. Only a K_d of 20 is required to show protection of groundwater in the shallow excavation. Therefore, aroclor-1254 is included for completeness, but is not necessary to calculate the groundwater HQ. All other site nonradionuclide COPCs were not detected, or quantified below background levels. Additionally, arsenic and lead were detected above background; however, the standard for each contaminant is not toxicity based, therefore a groundwater HQ is not calculated. An example of the HQ and risk calculations for soil constituents with a potential impact to groundwater is presented below:

1) The hazard quotient is defined as the ratio of the dose of a substance obtained over a specified time (mg/kg/day) to a reference dose for the same substance derived over the same specified time (mg/kg/day). The hazard quotient can also be calculated as the ratio of the concentration in soil (maximum or statistical value) (mg/kg) to the soil RAG (mg/kg) for protection of groundwater, where the RAG is the groundwater cleanup level (mg/L) (calculated with, and related to the hazard quotient through, WAC 173-340-720(3)(a)(ii)(A), 1996) x 100 x 1 mg/1000 mg (conversion factor)). This is based on the "100 times rule" of WAC 173-340-740(3)(a)(ii)(A) (1996). For example, the maximum value for boron of 5.07 mg/kg, divided by the noncarcinogenic RAG value of 320 mg/kg is 1.6×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation.) The cumulative HQ for the 128-H-1 waste site is 5.7×10^{-1}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, and then multiplied by 1×10^{-6}. The only detected carcinogenic constituent is aroclor-1254. The maximum value for aroclor-1254 is 0.00943 mg/kg, divided by 0.032 mg/kg, and multiplied as indicated, is 2.2×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-6}$, aroclor-1254 exceeded the individual carcinogenic risk value. However, based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009), the residual concentration of aroclor-1254 is not expected to migrate more than 0.25 m (0.825 ft) vertically in 1,000 years (based on the

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100H-CA-V0176	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 3 of 4	

distribution coefficient of 75.6 mL/g). The vadose zone underlying the shallow excavation (Area D) is approximately 3.5 m (11.4 ft) thick. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River. The cumulative excess cancer risk for the 128-H-1 waste site is also 2.2 x 10^{-6}. However, as previously discussed, aroclor-1254 is included for completeness but is not subject to the groundwater risk calculation.

4) The soil cleanup RAGs for protection of groundwater are based on the "100 times" provision in WAC 173-340-740(3)(a)(ii)(A). WAC 173-340-740(3)(a)(ii)(A) (1996) provides the "100 times rule" but also states "unless it can be demonstrated that a higher soil concentration is protective of ground water at the site." When the "100 times rule" values are exceeded, RESRAD was used to demonstrate that higher soil concentrations may be protective of groundwater.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None.
2) List the cumulative noncarcinogenic HQ >1.0: None.
3) List individual carcinogens and corresponding excess cancer risk >1 x 10^{-6}: None.
4) List the cumulative excess cancer risk for carcinogens >1 x 10^{-5}: None.

Table 1 shows the results of the calculations.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	T. E. Queen	Date:	7/14/2011	Calc. No.:	0100H-CA-V0176	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	7/14/2011
Subject:	128-H-1 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 4 of 4	

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 128-H-1 Waste Site.

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Arsenic[c]	65.3	20	--	--	--
Boron	5.07	320	1.6E-02	--	--
Chromium, hexavalent[d]	0.917	4.8	1.9E-01	--	--
Lead[e]	304	353	--	--	--
Molybdenum	0.490	8	6.1E-02	--	--
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.0682	96	7.1E-04	--	--
Acenaphthylene[f]	0.0662	.96	6.9E-04	--	--
Anthracene	0.00354	240	1.5E-05	--	--
Fluoranthene	0.0561	64	8.8E-04	--	--
Fluorene	0.0118	64	1.8E-04	--	--
Naphthalene	0.00657	16	4.1E-04	--	--
Phenanthrene[f]	0.0598	240	2.5E-04	--	--
Pyrene	0.187	48	3.9E-03	--	--
Pesticides					
Endosulfan (I, II, sulfate)	0.00129	9.6	1.3E-04	--	--
Polychlorinated Biphenyls					
Aroclor-1254[g]	0.00943	0.032	2.9E-01	0.00438	2.2E-06
Total Petroleum Hydrocarbons					
TPH - diesel range[h]	160	200	--	--	--
TPH - motor oil[h]	85.4	200	--	--	--
Totals					
Cumulative Hazard Quotient:			**5.7E-01**		
Cumulative Excess Cancer Risk:					**2.2E-06**

Notes:

[a] = From WCH (2011).

[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the "100 times" model.

[c] = The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009). The arsenic standard is not toxicity based, therefore, will not have a hazard quotient calculated.

[d] = Value for the carcinogenic RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.

[e] = Value for noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[f] = Toxicity data for these chemicals are not available. Cleanup levels are based on surrogate chemicals:
Contaminant: acenapthylene; surrogate: acenapthene, phenathrene; surrogate: anthracene

[g] = Aroclor-1254 was only detected in the staging pile area, overburden stockpile, and shallow zone excavation. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009), the residual concentration of aroclor-1254 is not expected to migrate more than 0.25 m (0.825 ft) vertically in 1,000 years (based on the distribution coefficient of 75.6 mL/g). The vadose zone underlying the soil below the shallow (Area D) excavation approximately 3.5 m (11.4 ft) thick. Therefore, the residual concentration of this constituent is predicted to be protective of groundwater and the Columbia River, and is not considered a carcinogenic risk to groundwater.

[h] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation. Diesel range extended results have been excluded because they are representative of only a single sample in the statistical set.

-- = not applicable RAG = remedial action goal

CONCLUSION:

This calculation demonstrates that the 128-H-1 waste site meets the requirements for the hazard quotients and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2009).

APPENDIX F

DATA QUALITY ASSESSMENT

APPENDIX F

DATA QUALITY ASSESSMENT

VERIFICATION SAMPLING

A data quality assessment (DQA) was performed to compare the verification sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (WCH 2010b). This DQA was performed in accordance with site specific data quality objectives found in the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2009).

A review of the sample design (WCH 2010b), the field logbook (WCH 2010a, 2011), and applicable analytical data packages has been performed as part of this DQA. All samples were collected and analyzed per the sample design. To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical analysis and radiochemical analysis (BHI 2000a, BHI 2000b) are used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., closeout decisions). The DQA completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2006).

Verification sample data for the 128-H-1 waste site comprises asbestos data and chemical data. The asbestos data were provided by the laboratories in six sample delivery groups (SDGs): MA00900, MA00917, MA00918, MA00919, MA00922, MA02509, MA02530, and D1116832. No major or minor deficiencies were identified in the asbestos data.

For the chemical analytes, data were provided by the laboratories in seven SDGs: SDG JP0188, SDG JP0190, SDG JP0205, SDG K2105, SDG K2118, SDG K2120, and SDG K2121. SDG K2118 was submitted for third-party validation.

Minor deficiencies are discussed for the 128-H-1 chemical data set, as follows below. If no comments are made about a specific analysis, it should be assumed that no deficiencies affecting the quality of the data were found.

SDG JP0188

This SDG comprises 13 statistical soil samples (J1JCV2 through J1JCV9, J1JCW0 through J1JCW4) collected from sampling area F. These samples were analyzed for inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAH), semivolatile organic compounds (SVOCs), and pesticides. One field duplicate pair (J1JCV3/ J1JCW4) is included in this SDG. Minor deficiencies are as follows:

In the hexavalent chromium analysis, the matrix spike (MS) recovered below the laboratory acceptance criteria at 71.8%. The insoluble MS recovered within acceptance criteria at 102%. A post-digestion spike was prepared from the sample extract which recovered at 98.6% for the soluble hexavalent chromium. The laboratory control sample also recovered within the acceptance criteria. These results indicate a reducing capacity in the sample matrix rather than a deficiency in the analytical methodology. The data are usable for decision-making purposes.

In the semivolatile organic analysis (SVOA), low level concentrations of the common laboratory contaminants bis(2-ethylhexyl) phthalate and diethyl phthalate were detected in the method blank (MB). These detections are below the reporting limits. For detections of these analytes in the associated data above the reporting limits, the laboratory has qualified the data with "B" flags to indicate the blank contamination. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticide analysis, the analytes endosulfan sulfate and methoxychlor recovered outside the control limits for the MS and MS duplicate (MSD). The laboratory has qualified the associated data with "N" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticide analysis, relative percent differences (RPDs) calculated using the laboratory duplicate were above the acceptance criteria for endosulfan II, endosulfan sulfate, and methoxychlor. The laboratory control sample (LCS) recovered within acceptance criteria and the laboratory determined that the analytical system was functioning within the acceptable range. These data may be considered estimated. Estimated data are usable for decision-making purposes.

The metals analysis and serial dilution evaluation indicated physical or chemical interference for cobalt. Associated cobalt data were qualified by the laboratory with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the metals analysis, the MS recovery for silicon is outside control limits. The LCS recovery for silicon was within control and indicates method accuracy. The laboratory qualified the associated silicon data with "N" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

SDG JP0190

This SDG comprises 13 statistical soil samples (J1JCR9, J1JCT0 through J1JCT9, and J1JCV0 through J1JCV1) collected from sampling area E. These samples were analyzed for ICP metals, mercury, hexavalent chromium, TPH, PCBs, PAH, SVOCs, and pesticides. One field duplicate pair (J1JCT4/J1JCV1) is included in this SDG. Minor deficiencies are as follows:

In the SVOA, a low level concentration of the common laboratory contaminant bis(2-ethylhexyl) phthalate was detected in the MB. This detection is below the reporting limits. For detections of bis(2-ethylhexyl) phthalate above the reporting limits, the laboratory has qualified the associated data with "B" flags to indicate the blank contamination. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOA, the surrogate recoveries in the MSD were outside the control limits. The surrogates are sample specific checks and the observed deficiency is limited to the MSD sample. There is no impact to the field sample data. The data are usable for decision-making purposes.

The ICP metals analysis and serial dilution evaluation indicated physical or chemical interference for copper and zinc. Associated cobalt data were qualified by the laboratory with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, low levels of chromium and copper are present in the MB. Because the concentrations are much less than the reporting limits or action level for these analytes the laboratory determined that no action was required. The data are usable for decision-making purposes.

In the ICP metals analysis, the MS recovery for silicon is outside control limits. The LCS recovery for silicon was within control and indicates method accuracy. The laboratory qualified the associated silicon data with "N" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, in the laboratory duplicate evaluation the RPDs calculated for the arsenic and nickel are outside the acceptance limits. The laboratory has qualified all associated arsenic and nickel data with "N" flags. Method accuracy was verified by the acceptable LCS results. The data are usable for decision-making purposes.

SDG JP0205

This SDG comprises one statistical soil sample (J1JCVX2) collected as a replacement sample at the A-9 location. This sample was analyzed for ICP metals, mercury, hexavalent chromium, TPH, PCBs, PAH, SVOCs, and pesticides. Minor deficiencies are as follows:

In the SVOA, the analytes benzo(b)fluoranthene and benzo(k)fluoranthene were unresolved in sample J1JVX2 due to apparent matrix interference. The laboratory has reported the combined peak as benzo(b)fluoranthene and reported benzo(k)fluoranthene as non-detected even though both may be present in the sample. The associated data have been qualified with "K" qualifiers. These data for sample J1JVX2 may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOA, a low level concentration of the common laboratory contaminant bis(2-ethylhexyl) phthalate was detected in the MB. This detection is below the reporting limits. For detections of bis(2-ethylhexyl) phthalate above the reporting limits, the laboratory has qualified the associated data with "B" flags to indicate the blank contamination. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticides analysis, the RPD between the primary and confirmatory columns was in excess of the acceptance criteria (40%) for 4,4'-DDE in sample J1JVX2. The laboratory noted apparent matrix interference, reported the lower value, and qualified the result for 4,4'-DDE in sample J1JVX2 with an "X" flag. This result may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticides analysis, the analyte methoxychlor was detected at a low level in the MB. The MB concentration is below the reporting limits and the laboratory determined that no corrective action is needed. The associated methoxychlor data have been qualified with "B" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the diesel range TPH analysis, an evaluation of a serial dilution indicated physical or chemical interference for the analytes lead and zinc in sample J1JVX2. Associated sample results were qualified by the laboratory with "X".

In the PAH analysis, the RPD calculated between the primary and confirmatory columns exceeded 40% in sample J1JVX2. Associated data for sample J1JVX2 have been qualified with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

The ICP metals analysis and serial dilutions indicated physical and chemical interferences for lead and zinc. The laboratory has qualified the associated lead and zinc data with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recovery for silicon is outside control limits. The LCS recovery for silicon was within control and indicates method accuracy. The laboratory qualified the associated silicon data with "N" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the duplicate analysis of sample J1JVX2 exhibited RPD data outside the control limits for mercury. Associated sample results have been flagged "M" by the laboratory. These data may be considered estimated. Estimated data are usable for decision-making purposes.

SDG K2105

This SDG comprises six statistical soil samples (J1B893 through J1B897, and J1B8B1) collected from sampling area C. These samples were analyzed for ICP metals, mercury, hexavalent chromium, TPH, PCBs, PAH, SVOCs, and pesticides. Minor deficiencies are as follows:

In the ICP metals analysis, the analytes antimony, aluminum, beryllium, iron, chromium magnesium, manganese, silicon, and vanadium recovered outside the laboratories acceptance criteria for the MS. The laboratory ran post digestion spikes (PDSs) and serial dilutions to confirm quantitation on these analytes. All had acceptable PDS recoveries in the range of 79.2-123 %. With the exception of antimony the original spike concentrations were small compared to the native concentrations of these analytes and the MS result is due to natural variability in the analytical result rather than a deficiency in the MS recovery. The original antimony spike was not too small. Results for antimony may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the RPD calculated for silicon is above the acceptance criteria at 67%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Silicon results in SDG K2105 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, a low level concentration of magnesium was detected in the MB. This detection is well below the reporting limit and there is not impact to the field sample data. The laboratory has flagged the associated magnesium data with "B" flags. The data are usable for decision-making purposes.

In the SVOA, the LCS result for 2,4,6-trichlorophenol was below the acceptance criteria at 48%. Acidic phenols, such as this, are subject to erratic chromatographic behavior. The 2,4,6-trichlorophenol results in SDG K2105 may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOA, the MS and or MSD recoveries for 1,2,4-trichlorobenzene, 1,3-dichlorobenzen, 1,4-dichlorobenzene, 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2-methylnaphthalene, isophorone, and 4-chloro-4methylphenol were below the acceptance criteria with recoveries in the range of 50-59% with the exception of 2,4,6-trichlorophenol which recovered at 32%. Analytical data for these analytes in SDG K2105 may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticides analysis, one of the MSD samples was lost during extraction due to a laboratory error. There is no impact to the field sample data. The data are usable for decision-making purposes.

SDG K2118

This SDG comprises 21 statistical soil samples (J1B898, J1B899, J1B8B0 through J1B8B9, and J1B8C0 through J1B8C8) collected from sampling areas C and D. These samples were analyzed for ICP metals, mercury, hexavalent chromium, TPH, PCBs, PAH, SVOCs, and pesticides. One field duplicate pair (J1B8B0/J1B8B5) for sampling area C and one duplicate pair (J1B8C0/J1B8C8) for sampling area D are included in this SDG. SDG K2118 was submitted for third-party validation. Minor deficiencies are as follows:

In the PAH analysis, the MS/MSD recoveries for fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, benzo(a)athracente, benzo(b)fluoranthene, benzo(a)pyrene and benzo(g,h,i)perylene are below the acceptance criteria in the range of -45% to 40%. The spike levels for these compounds were not sufficiently large to overcome the analytical variability of the native concentrations in the sample matrix. Therefore the MS/MSD recoveries are not a good measure of spike recovery. The LCS recoveries for these analytes confirm quantitation for these analytes. Third-party validation qualified the data for all of these analytes with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the PAH analysis, the RPDs calculated for benzo(a)anthracene (38%) , pyrene(-19%), chrysene(34%), and benzo(b)fluoranthene (-75%) are outside quality control (QC) limits. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Third-party validation qualified the data for all of these analytes with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the pesticide analysis, the samples were run at a four times dilution due to a high target analyte concentration (4,4-DDE). The reporting limits for the non-detected analytes were elevated due to the dilution, but there is no indication that any of these are present. The data are usable for decision-making purposes.

In the ICP metals analysis, low level concentrations of calcium, potassium, and silicon were detected in the MB. These detections are all below the reporting limits and there is no impact on the field sample data. The laboratory as qualified the associated data with "B" flags to indicate the blank contamination. The data are usable for decision-making purposes.

In the ICP metals analysis, the analytes antimony, aluminum, iron, chromium iron, lead, manganese, silicon, and vanadium recovered outside the laboratories acceptance criteria for the MS. The laboratory ran PDSs and serial dilutions to confirm quantitation on these analytes. All had acceptable PDS recoveries in the range of 74.8-110% with the exception of iron and lead which recovered at 48.2% and 65.6%, respectively. With the exception of antimony and vanadium the original spike concentrations were small compared to the native concentrations of these analytes and the MS result is due to natural variability in the analytical result rather than a deficiency in the MS recovery. The original antimony and vanadium spikes were sufficient. Results for antimony, and vanadium were qualified by third-party validation with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the RPDs calculated for chromium (73%), magnesium (64%), and nickel (104%) are above the acceptance criteria (30%). Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix rather than to a deficiency in the analytical system. Third-party validation qualified the data for these analytes with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the SVOA, there is no MSD recovery for di-n-butyl phthalate. Third party validation qualified the associated di-n-butyl phthalate results with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the SVOA, the MSD recoveries for 2,4-dinitrophenol and hexachlorocyclopentadiene associated with samples J1B8C7 and J1B8C8 are outside the QC limits. Third-party validation qualified the 2,4-dinitrophenol and hexachlorocyclopentadiene data for samples J1B8C7 and J1B8C8 with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the SVOA, the RPDs calculated 1,2-dichlorobenzene (45%), 1,3-dichlorobenzene (63%), and hexachlorocyclopentadiene (40%) associated with samples J1B8C7 and J1B8C8 are outside the QC limits. Third-party validation qualified these analytes in samples J1B8C7 and J1B8C8 with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the SVOA, the RPDs calculated for 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-chlorophenol, 2-methylphenol, 2-nitroanaline, 3,3-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-chlorophenylphenylether, c-methylphenol, 4-methylphenol, 4nitroanaline, 4-nitrophenol, acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benxo(k)fluoranthene, bis(2-chloroethoxy)methane, bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, chrysene, dibenz(a,h)anthracene, dibenzofuran, diethyl phthalate, dimethyl phthalate, di-n-octylphthalate, fluoranthene, fluorene, hexachlorobenzene, hexachlorocylcopentadiene, hexachloroethane, indeno(1,2,3-cd)pyrene, isophorone, naphthalene, n-nitroso-di-n-propylamine, n-nitrosodiphenylamine, phenanthrene, phenol, and pyrene are above the acceptance criteria. Third-party validation qualified these analytes in all samples in SDGK K2118 with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the SVOA, an LCS recovery for 2,4-dinitrophenol is below the acceptance criteria at 41%. Third party validation qualified all of the associated 2,4-dinitrophenol with "J" flags as estimates. Estimated data are usable for decision-making purposes.

In the SVOA, the MS recoveries for 1,2,4-trichlorobenzene and isophorone are low at 59% and 55%, respectively. Analytical data for these analytes in SDG K2118 may be considered estimated. Estimated data are usable for decision-making purpose.

In the SVOA, the MS recoveries for 2,4-dinitrophenol, 2,4-dinitrotoluene, 2-nitroanaline, 4-chlorophenyl phenyl ether, benzo(a)pyrene, carbozole, and fluoranthene recovered above the acceptance criteria in the range of 121- 132%. These results may indicate a high bias for these analytes in the field sample data. High biased data are usable for decision-making purposes.

In the SVOA, the LCS recovery for di-n-octyl phthalate is high at 156%. This result may indicate a high bias in the field sample data for di-n-octyl phthalate. High biased data are usable for decision-making purposes.

SDG K2120

This SDG comprises 13 statistical soil samples (J1B880 through J1B889, and J1B890 through J1B892) collected from sampling area B. These samples were analyzed for ICP metals, mercury, hexavalent chromium, TPH, PCBs, PAH, SVOCs, and pesticides. One field duplicate pair (J1B887/J1B892) is included in this SDG. Minor deficiencies are as follows:

In the SVOA, the surrogates 2-fluorophenol and nitrobenzene-d5 recovered below the acceptance criteria at 13% and 7%, respectively in sample J1B888. This result is limited to sample J1B888 and does not impact the other field sample data. All SVOA data for sample J1B888 may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOA, the MS and or MSD recoveries for the analytes 2,4,6-trichlorophenol, 1,2,4-trichlorobenzene, and isophorone are below the acceptance criteria in the range of 43-58%. Analytical results for these analytes in SDG K2120 may be considered estimated. Estimated data are usable for decision-making purposes.

In the PCB analysis, high surrogate recoveries have been reported for samples J1B888 (155%, 73%), and J1B890 (113%, 127%). This suggests a high bias in the analytical data for these samples. None of the target analytes were detected; therefore, a high bias has no impact the data. The data are usable for decision-making purposes.

In the PCB analysis, high surrogate recoveries have been reported for samples J1B889 (149%, 171%), and J1B891 (139%, 172%). This suggests a high bias in the analytical data for these samples. Target analytes were detected in these two samples. The data for detected analytes should be considered high biased and estimated. High biased and estimated data are usable for decision-making purposes.

In the ICP metals analysis, the analytes antimony, aluminum, iron, and silicon recovered outside the laboratories acceptance criteria for the MS. The laboratory ran PDSs and serial dilutions to confirm quantitation on these analytes. All had acceptable PDS recoveries in the range of 73.3-94.4% with the exception of silicon which recovered at 62.3%. The original silicon MS was prepared using sufficient analyte that the recovery would be expected to have been in the acceptable range. Results for antimony and silicon may be considered estimated. Estimated data are usable for decision-making purposes.

In the TPH diesel analysis, the surrogate recovery for sample J1B892 is low at 35%. The laboratory re-extracted and reran the sample 8 days past holding time. The two results are similar at 8,470 μg/kg and 9,590 μg/kg. The difference between the results can be attributed to natural heterogeneities in the sample matrix. Both results may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticide analysis, because toxaphene is made up of many compounds no MS, MSD, or LCS analysis was performed. Third-party validation qualified all toxaphene data with "J" flags as estimated. Estimated data are usable for decision-making purposes.

In the TPH motor oil analysis, no MS, MSD, or LCS analysis was performed. Third-party validation qualified all TPH motor oil data with "J" flags as estimated. Estimated data are usable for decision-making purposes.

SDG K2121

This SDG comprises 13 statistical soil samples (J1B853 through J1B859, and J1B860 through J1B866) collected from sampling area A. These samples were analyzed for ICP metals, mercury, hexavalent chromium, TPH, PCBs, PAH, SVOCs, and pesticides. One field duplicate pair (J1B856/J1B866) is included in this SDG. Minor deficiencies are as follows:

In the SVOA, the surrogate 2,4,6-tribromophenol in sample J1B862 recovered above the acceptance criteria at 127%. This result suggests a high bias for the analytes associated with this surrogate. None of the associated analytes were detected therefore there is no impact to the sample J1B862 data. The data are usable for decision-making purposes.

In the SVOA, one LCS recovery for di-n-octyl phthalate recovered above the acceptance criteria at 156%. This suggests a high bias for di-n-octyl phthalate data in SDG K2121. High biased data are usable for decision-making purposes.

In the SVOA, the MS/MSD recoveries for hexachlorocyclopenadiene, 2,4,5-trichlorophenol, 3,3,'-dichlorobenzidine, and 4-nitroaniline are outside the acceptance criteria range. Data for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticide analysis, the MSD recovery for beta-BHC is above the acceptance criteria range at 135%. This result suggests a high bias in the field sample data for beta-BHC. However, beta-BHC was not detected in any of the field samples and there is no impact to the data set. The data are usable for decision-making purposes.

In the ICP metals analysis, the MS recovery for antimony is outside the acceptance criteria. Antimony results in SDG K2121 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries for aluminum calcium, iron, and silicon are outside the acceptance criteria. The laboratory has run PDSs and serial dilutions to confirm quantiation. The PDS results for calcium and iron were below the acceptance criteria. All calcium and iron results in SDG K2121 may be considered estimated. Estimated data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

Relative percent difference evaluations of main sample(s) versus the laboratory duplicate(s) are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance QA/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Field QA/QC samples, listed in the field logbooks (WCH 2010a, 2011), are shown in Table F-1. The main and QA/QC sample results are presented in Appendix E.

Table F-1. Field Quality Assurance/Quality Control Samples.

Sample Area	Main Sample	Duplicate Sample
Waste Site Area A	J1B856	J1B856
Waste Site Area B	J1B887	J1B892
Waste Site Area C	J1B8B0	J1B8B5
Waste Site Area D	J1B8C0	J1B8C8
Waste Site Area E	J1JCT4	J1JCV1
Waste Site Area F	J1JCV3	J1JCW4

Field duplicate samples are collected to provide a relative measure of the degree of local heterogeneity in the sampling medium, unlike laboratory duplicates that are used to evaluate precision in the analytical process. The field duplicates are evaluated by computing the RPD of the sample/duplicate pair(s) for each contaminant of potential concern (COPC). Relative percent differences are not calculated for analytes that are not detected in both the main and duplicate sample at more than 5 times the target detection limit (TDL). Relative percent differences of analytes detected at low concentrations (less than 5 times the detection limit) are not considered to be indicative of the analytical system performance. The calculation brief in Appendix E provides details on duplicate pair evaluation and RPD calculation.

The RPDs for silicon (51.0%, 73.1%) in waste site areas A and E, and lead (51.1%) in waste site area B are above the acceptance criteria of 30%. A secondary check of the data variability is used when one or both of the samples being evaluated (main and duplicate) is less than 5 times the TDL, including undetected analytes. In these cases, a control limit of ±2 times the TDL is used (Appendix E) to indicate that a visual check of the data is required by the reviewer. The TPH motor oil duplicate sample results from waste site area A, and the benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, phenanthrene and pyrene duplicate sample from waste site area required this check. A visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The data are usable for decision-making purposes.

SUMMARY

Limited, random, or sample matrix-specific influenced batch QC issues such as those discussed above, are a potential for any analysis. The number and types seen in these data sets are within expectations for the matrix types and analyses performed. The DQA review of the 128-H-1 waste site verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for 128-H-1waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. The analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in the Environmental Restoration project-specific database prior to being submitted for inclusion in the

Hanford Environmental Information System database. The verification sample analytical data are also summarized in Appendix E.

REFERENCES

BHI, 2000a, *Data Validation Procedure for Chemical Analysis*, BHI-01435, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2000b, *Data Validation Procedure for Radiochemical Analysis*, BHI-01433, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

DOE-RL, 2009, *100 Area Remedial Action Sampling and Analysis Plan,* DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 2006, *Guidance on Systematic Planning using the Data Quality Objectives Process*, EPA QA/G-4, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, D.C.

WCH, 2010a, *100-H Field Remediation and Sampling*, Logbook EL-1627-04, pp. 52-63, Washington Closure Hanford, Richland, Washington.

WCH, 2010b, *Work Instruction for Verification Sampling of the 128-H-1, 100-H Burning Pit*, 0100H-WI-G0041, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2011, *100-H Field Remediation and Sampling*, Logbook EL-1627-05, pp. 23-25, 29-33, and 40, Washington Closure Hanford, Richland, Washington.

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CALCULATION COVER SHEET

Project Title: 100-H Field Remediation Job No. 14655

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0164

Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculation

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 47 Attm. 1 = 79 Total = 127	J. D. Skoglie	T. E. Queen	B. L. Vedder	D. F. Obenauer	6/22/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford | **CALCULATION SHEET**

Originator	J. D. Skoglie	**Date**	05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project	100-H Field Remediation	**Job No.**	14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations				**Sheet No.** 1 of 47

Summary

Purpose:

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) Model Toxics Control Act (MTCA) 3-part test for nonradionuclide analytes and calculate the relative percent difference (RPD) for primary-duplicate sample pairs for each contaminant of concern (COC) and contaminant of potential concern (COPC), as necessary.

Table of Contents:

Given/References:

1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2009b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets),* Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
10) EPA, 1989, Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A; Interim Final, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D.C.
11) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Administrative Code.*

Solution:

Calculation methodology is described in Ecology Pub. #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2009b). Use data from attached worksheets to perform the 95% UCL calculation for each analyte, the WAC 173-340-740(7)(e) 3-part test for nonradionuclides, and the RPD calculations for each COC/COPC. The hazard quotient and carcinogenic risk calculations are located in a separate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:

The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 116-H-5 waste site. The data were entered into an EXCEL 2003 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with the RDR/RAWP (DOE-RL 2009b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:

The 116-H-5 waste site underwent statistical sampling at four decision units; shallow zone, dep zone, overburden, and the staging pile area for verification sampling. Information on the re-samples taken at these locations are available in the RSVP.

Analytical results for all sampling locations are summarized in the tables provided on sheets 3, 4, and 5. Further information of the sample data quality is presented in the data quality assessment section of the associated RSVP.

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie **Date** 05/17/11 **Calc. No.** 0100H-CA-V0164 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** T. E. Queen **Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 2 of 47

Summary (continued)

Methodology, continued:

For nonradioactive analytes with ≤50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup is the 95% UCL. For nonradioactive analytes with >50% of the data below detection limits, as determined by direct inspection of the sample results (Attachment 1), the maximum detected value for the data set (which includes primary and duplicate samples) is used instead of the 95% UCL, and no further calculations are performed for those data sets. For convenience, these maximum detected values are included in the summary tables that follow. The 95% UCL was not calculated for data sets with no reported detections. Calculated cleanup levels are not available in Ecology (2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs/COPCs and are also not included in these calculations. The 95% UCL values were not calculated for potassium-40, radium-226, radium-228, thorium-228, and thorium-232 based on natural occurence at the Hanford Site.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above. For radionuclide data, calculation of the statistics is done using the reported value. In cases where the laboratory does not report a value below the minimum detectable activity (MDA), half of the MDA is used in the calculation. For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above.

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets (n < 10), the calculations are performed assuming nonparametric distribution, so no tests for distribution are performed. For nonradionuclide data sets of ten or greater, as for the subject site, distributional testing is done using Ecology's MTCAStat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2009b) and MTCAStat coding and due to a limitation in the MTCAStat coding (no direct capability to address variable quantitation limits within a data set), substitutions for censored data are performed before software input and the resulting data set treated as uncensored.

The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:
1) the 95% UCL exceeds the most stringent cleanup limit for each COPC/COC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC/COC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC/COC.

The RPD is calculated when both the primary value and either the duplicate or split value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed in Table 2-1 of the SAP (DOE-RL 2009a) for certain constituents. All other constituents will have their own pre-determined TDL's based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

$$RPD = [|M-S|/((M+S)/2)]*100$$

where, M = Main Sample Value S = Split (or duplicate) Sample Value

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. If the RPD is greater than 30%, further investigation regarding the usability of the data is performed. To assist in the identification of anomalous sample pairs, when an analyte is detected in the primary or duplicate/split sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate/split result exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0164 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 3 of 47

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the shallow zone, deep zone, overburden, staging pile area, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Shallow and Deep Zones

Analyte	SZ		DZ		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Carbon-14	0.800	--	0.898	--	pCi/g
Cesium-137	--	--	0.161	--	pCi/g
Cobalt-60	--	--	0.045	--	pCi/g
Europium-152	--	--	1.37	--	pCi/g
Nickel-63	3.72	--	3.11	--	pCi/g
Total beta radiostrontium	0.357	--	--	--	pCi/g
Tritium	2.08	--	2.49	--	pCi/g
Uranium-233/234	0.633	--	0.635	--	pCi/g
Uranium-238	0.646	--	0.622	--	pCi/g
Arsenic	6.53	--	6.3	--	mg/kg
Barium	62.4	--	69.8	--	mg/kg
Beryllium	0.198	--	0.089	--	mg/kg
Boron	1.59	--	--	1.2	mg/kg
Cadmium	0.0853	--	0.089	--	mg/kg
Chromium	12.9	--	11.6	--	mg/kg
Cobalt	6.30	--	6.2	--	mg/kg
Copper	14.4	--	15.3	--	mg/kg
Hexavalent chromium	--	0.060	--	--	mg/kg
Lead	18.8	--	18.7	--	mg/kg
Manganese	269	--	255	--	mg/kg
Mercury	--	0.019	--	0.020	mg/kg
Molybdenum	0.273	--	--	0.87	mg/kg
Nickel	11.5	--	11.7	--	mg/kg
Vanadium	48.2	--	47.0	--	mg/kg
Zinc	47.2	--	43.6	--	mg/kg
Chloride	--	2.1	--	17.6	mg/kg
Fluoride	0.98	--	1.3	--	mg/kg
Nitrogen in nitrate	2.44	--	34.0	--	mg/kg
Nitrogen in nitrate and nitrite	1.90	--	31.3	--	mg/kg
Nitrogen in nitrite	--	--	--	0.40	mg/kg
Sulfate	9.2	--	55.2	--	mg/kg
Acenaphthene	--	2.79	--	--	ug/kg
Anthracene	--	7.60	--	5.1	ug/kg
Benzo(a)anthracene	20.8	--	--	54	ug/kg
Benzo(a)pyrene	18.8	--	--	41	ug/kg
Benzo(b)fluoranthene	14.0	--	--	51	ug/kg
Benzo(ghi)perylene	11.7	--	--	32	ug/kg
Benzo(k)fluoranthene	6.75	--	--	30	ug/kg
Bis(2-ethylhexl)phthalate	--	--	67	--	ug/kg
Chrysene	23.6	--	--	45	ug/kg
Dibenz[a,h]anthracene	--	2.75	--	--	ug/kg
Fluorene	--	1.57	--	--	ug/kg
Fluoranthene	66.6	--	--	69	ug/kg
Indeno(1,2,3-cd)pyrene	13.6	--	--	35	ug/kg
Naphthalene	--	15.0	--	--	ug/kg
Phenanthrene	21.7	--	--	18	ug/kg
Pyrene	25.4	--	--	77	ug/kg
Aroclor-1260	--	3.85	--	7.31	ug/kg
4,4'-DDD	--	--	--	2.12	ug/kg
4,4'-DDE	--	0.45	--	--	ug/kg
4,4'-DDT	--	--	--	3.10	ug/kg
TPH-diesel range	--	2600	--	--	ug/kg
TPH-diesel range EXT	--	8100	--	--	ug/kg
TPH-motor oil (high boiling)	13352	--	33760	--	ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	SZ		DZ	
Cleanup Limit?	YES	NO	YES	YES
> 10% above Cleanup Limit?	YES	NO	YES	YES
Any sample > 2x Cleanup Limit?	YES	NO	YES	YES

[a]The 95% UCL result or maximum value, depending on data censorship,
-- = not applicable
B = blank contamination (inorganic constituents)
C = Sample was ≤5X the blank concentration
CVP = closeout verification package
D = dilution
DE = direct exposure
GW = groundwater
J = estimate
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
RAG = remedial action goal
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
SAP = sampling and analysis plan
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = Washington Administrative Code

Washington Closure Hanford CALCULATION SHEET

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0164 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 4 of 47

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the shallow zone, deep zone, overburden, staging pile area, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Overburden and Staging Pile Area					
Analyte	OB		SPA		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Carbon-14	0.866	--	--	--	pCi/g
Cesium-137	--	--	0.0245	--	pCi/g
Plutonium-238	0.268	--	--	--	pCi/g
Technetium-99	--	--	0.499	--	pCi/g
Tritium	0.570	--	--	--	pCi/g
Uranium-233/234	1.16	--	0.0822	--	pCi/g
Uranium-238	0.547	--	1.10	--	pCi/g
Antimony	0.414	--	--	--	mg/kg
Arsenic	5.89	--	14.0	--	mg/kg
Barium	53.8	--	80.0	--	mg/kg
Beryllium	0.174	--	0.17	--	mg/kg
Boron	1.43	--	2.4	--	mg/kg
Cadmium	0.094	--	0.12	--	mg/kg
Chromium	11.5	--	11.0	--	mg/kg
Cobalt	5.58	--	6.9	--	mg/kg
Copper	13.6	--	14.8	--	mg/kg
Hexavalent chromium	0.16	--	--	--	mg/kg
Lead	17.0	--	33.4	--	mg/kg
Manganese	258	--	283	--	mg/kg
Mercury	--	--	--	0.014	mg/kg
Molybdenum	0.318	--	--	0.33	mg/kg
Nickel	10.8	--	10.8	--	mg/kg
Silver	--	0.156	--	--	mg/kg
Vanadium	44.4	--	48.0	--	mg/kg
Zinc	43.4	--	41.1	--	mg/kg
Chloride	--	20.6	--	9.5	mg/kg
Fluoride	0.8	--	1.0	--	mg/kg
Nitrogen in nitrate	3.0	--	15.3	--	mg/kg
Nitrogen in nitrate and nitrite	2.4	--	16.0	--	mg/kg
Sulfate	8.2	--	51.6	--	mg/kg
Acenaphthene	--	21.9	--	--	ug/kg
Acenapthylene	--	--	--	27	ug/kg
Anthracene	--	58.4		87	ug/kg
Benzo(a)anthracene	78.5	--	58	--	ug/kg
Benzo(a)pyrene	83.1	--	88.5	--	ug/kg
Benzo(b)fluoranthene	105	--	48	--	ug/kg
Benzo(ghi)perylene	62.9	--	--	96	ug/kg
Benzo(k)fluoranthene	21.9	--	23	--	ug/kg
Bis(2-ethylhexl)phthalate	--	120	121	--	ug/kg
Chrysene	113	--	47	--	ug/kg
Dibenz[a,h]anthracene	6.29	--	--	26	ug/kg
Fluoranthene	188	--	--	400	ug/kg
Fluorene	--	32.3	--	57	ug/kg
Indeno(1,2,3-cd)pyrene	83.4	--	36	--	ug/kg
Naphthalene	--	25.1	--	--	ug/kg
Phenanthrene	107	--	50	--	ug/kg
Pyrene	342	--	105	--	ug/kg
Aroclor-1254	--	--	--	15	ug/kg
Aroclor-1260	--	--	--	10	ug/kg
4,4'-DDE	--	0.45	--	40	ug/kg
4,4'-DDT	--		--	5.3	ug/kg
TPH-diesel range	--	3200	6149	--	ug/kg
TPH-diesel range EXT	--	6500	19353	--	ug/kg
TPH-motor oil (high boiling)	--	15000	147061	--	ug/kg
3-Part Test Evaluation:					
95% UCL or maximum[a] >	OB		SPA		
Cleanup Limit?	YES	NO	YES	YES	
> 10% above Cleanup Limit?	YES	NO	YES	YES	
Any sample > 2x Cleanup Limit?	YES	NO	YES	YES	

[a]The 95% UCL result or maximum value, depending on data censorship.

-- = not applicable
B = blank contamination (inorganic constituents)
C = Sample was ≤5X the blank concentration
CVP = closeout verification package
D = dilution
DE = direct exposure
GW = groundwater
J = estimate
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
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QA/QC = quality assurance/quality control
RAG = remedial action goal
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RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
SAP = sampling and analysis plan
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UCL = upper confidence limit
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Washington Closure Hanford		CALCULATION SHEET			
Originator J. D. Skoglie		**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.**	0
Project 100-H Field Remediation		**Job No.** 14655	**Checked** T. E. Queen	**Date**	05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations				**Sheet No.**	5 of 47

Summary (continued)

Results:

The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the shallow zone, deep zone, overburden, staging pile area, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Relative Percent Difference Results and QA/QC Analysis[a]

Analyte	Duplicate Analysis			
	SZ	DZ	OB	SPA
Potassium-40	11.6%	0.0%	12.4%	24.3%
Radium-226	1.9%	13.7%	–	11.4%
Radium-228	7.1%	–	–	–
Aluminum	10.0%	5.7%	4.8%	3.0%
Barium	12.0%	3.0%	8.5%	10.1%
Calcium	4.8%	6.6%	12.1%	2.3%
Chromium	28.6%	16.5%	2.9%	8.7%
Copper	9.2%	13.3%	0.0%	7.6%
Iron	14.9%	4.1%	2.5%	1.5%
Magnesium	12.8%	8.3%	1.0%	7.2%
Manganese	8.2%	3.1%	4.5%	1.3%
Silicon	10.9%	13.1%	13.0%	17.3%
Vanadium	18.5%	3.3%	7.3%	6.0%
Zinc	10.9%	23.8%	3.2%	1.1%
Benzo(a)anthracene (Method 8310)	–	–	–	30.0%
Benzo(a)pyrene (Method 8310)	–	–	–	***34.5%***
Benzo(b)fluoranthene (Method 8310)	–	–	–	30.3%
Chrysene (Method 8310)	–	–	–	13.3%
Fluoranthene (Method 8310)	–	–	–	***31.9%***
Indeno (1,2,3-cd)pyrene (Method 8310)	–	–	–	8.7%
Phenanthrene (Method 8310)	–	–	–	***59.5%***
Pyrene (Method 8310)	–	–	–	28.6%
TPH motor oil (high boiling)	–	–	–	***45.6%***

[a]RPD listed where result produced, based on criteria. If RPD not required, no value is listed. The significance of the reported RPD values, including values greater than 30%, is addressed in the data quality assessment section of the RSVP.

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

CALCULATION SHEET

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116-H-5 Statistical Calculations

Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Carbon-14			Nickel-63			Total beta radiostrontium			Tritium			Uranium-233/234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.701	UJ	0.814	0	U	3.08	0	U	0.316	2.83	J	2.56	0.77		0.228	0.681		0.226
Duplicate of J19YB9	J19YD0	5/18/10	1.20		0.938	0.357	U	2.88	0	U	0.238	0	U	3.16	0.930		0.178	0.768		0.178
SZ-1	J19YB8	5/18/10	0.772	UJ	0.882	0	U	3.17	0	U	0.303	4.84	J	2.66	0.266		0.157	0.225		0.157
SZ-3	J19YC0	5/18/10	0.773	UJ	0.799	0.638	U	2.96	0.00100	U	0.277	3.97	J	2.63	0.395		0.233	0.426		0.233
SZ-4	J19YC1	5/18/10	0.946	J	0.802	0	U	3.32	0	U	0.296	4.01	J	2.53	0.326		0.228	0.444		0.226
SZ-5	J19YC2	5/18/10	0.809	UJ	0.970	0	U	3.22	0.0280	U	0.257	3.72	J	2.63	0.811		0.222	0.753		0.222
SZ-6	J19YC3	5/18/10	0.603	UJ	0.893	0	U	3.02	0	U	0.264	4.70	J	2.78	0.739		0.202	0.739		0.202
SZ-7	J19YC4	5/18/10	0.874	J	0.805	0	U	2.90	0.0120	U	0.261	5.90	J	2.59	0.594		0.216	0.678		0.216
SZ-8	J19YC5	5/18/10	0.521	UJ	0.916	0	U	2.98	2.40		0.242	0.994	J	2.73	0.724		0.213	0.669		0.213
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.000142	U	0.463	0	U	13.8	0	U	0.174	0.0527		0.0245	0.0792	U	0.114	0.214		0.123
SZ-10	J19YC7	5/18/10	0.520	UJ	0.801	1.05	U	2.96	0	U	0.251	3.75	J	2.64	0.609		0.245	0.833		0.245
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0	U	0.464	18.5		14.6	0	U	0.193	0.0530		0.0137	0.198		0.123	0.454		0.137
SZ-12	J19YC9	5/18/10	0.951		0.867	1.28	U	2.97	0	U	0.252	0	U	2.97	0.552		0.156	0.368		0.156

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Nickel-63 pCi/g	Total beta radiostrontium pCi/g	Tritium pCi/g	Uranium-233/234 pCi/g	Uranium-238 pCi/g
SZ-2	J19YB9/ J19YD0	5/18/10	0.951	0.179	0	1.42	0.850	0.725
SZ-1	J19YB8	5/18/10	0.772	0	0	4.84	0.266	0.225
SZ-3	J19YC0	5/18/10	0.773	0.638	0	3.97	0.395	0.426
SZ-4	J19YC1	5/18/10	0.946	0	0	4.01	0.326	0.444
SZ-5	J19YC2	5/18/10	0.809	0	0.0280	3.72	0.811	0.753
SZ-6	J19YC3	5/18/10	0.603	0	0	4.70	0.739	0.739
SZ-7	J19YC4	5/18/10	0.874	0	0.0120	5.90	0.594	0.678
SZ-8	J19YC5	5/18/10	0.521	0	2.40	0.994	0.724	0.669
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0	0	0	0.0527	0.079	0.214
SZ-10	J19YC7	5/18/10	0.520	1.05	0	3.75	0.609	0.833
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0	18.5	0	0.0530	0.198	0.454
SZ-12	J19YC9	5/18/10	0.951	1.28	0	0	0.552	0.368

Statistical Computations

	Carbon-14	Nickel-63	Total beta radiostrontium	Tritium	Uranium-233/234	Uranium-238
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic	Radionuclide data set. Use nonparametric z-statistic	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
N	12	12	12	12	12	12
% < Detection limit	67%	92%	92%	8%	8%	0%
Mean	0.640	1.21	0.0290	1.07	0.512	0.544
Standard deviation	0.336	5.28	0.692	2.13	0.255	0.214
Z-statistic	1.64	1.64	1.64	1.64	1.64	1.64
95% UCL on mean	0.800	3.72	0.357	2.06	0.633	0.646
Maximum value	1.20	18.5	2.40	5.90	0.930	0.833

Footnotes apply to all calculations sheets and attachment 1.

[a] Location re-sampled due to RAG exceedance. All replaced data is shown in attachment 1 and is for information only. Re-sample strategy is further explained in the RSVP.

[b] Nitrate, nitrite, and phosphate were converted to nitrogen in nitrate, nitrogen in nitrite, and phosphorus in phosphate respectively.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

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116-H-5 Statistical Calculations

Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Cadmium			Chromium			Cobalt			Copper			Lead			Manganese		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	4.27		0.907	67.8		0.453	0.263		0.181	1.22	B	1.81	0.227	U	0.227	21.2		0.907	6.33		2.72	12.5		1.81	4.66		0.907	278		0.907
Duplicate of J19YB9	J19YD0	5/18/10	3.99		0.695	60.1		0.348	0.232		0.139	1.11	B	1.39	0.073	B	0.174	15.9		0.695	5.42		2.09	11.4		1.39	5.41		0.695	258		0.695
SZ-1	J19YB8	5/18/10	2.13		0.742	33.6		0.371	0.13	B	0.148	0.759	B	1.48	0.0410	B	0.186	8.93		0.742	4.91		2.23	12.2		1.48	3.44		0.742	227		0.742
SZ-3	J19YC0	5/18/10	2.83		0.801	69.8		0.401	0.208		0.160	3.44		1.60	0.0861	B	0.200	12.7		0.801	5.79		2.40	13.1		1.60	8.37		0.801	268		0.801
SZ-4	J19YC1	5/18/10	5.32		0.902	51.9		0.451	0.172	B	0.180	1.26	B	1.80	0.0649	B	0.225	10.4		0.902	6.11		2.71	16.1		1.80	15.2		0.902	257		0.902
SZ-5	J19YC2	5/18/10	6.45		0.767	46.7		0.383	0.192		0.153	1.12	B	1.53	0.0602	B	0.192	11.0		0.767	5.45		2.30	13.0		1.53	15.9		0.767	263		0.767
SZ-6	J19YC3	5/18/10	3.75		0.837	63.4		0.418	0.216		0.167	1.26	B	1.67	0.0586	B	0.209	12.8		0.837	6.41		2.61	12.8		1.67	6.41		0.837	274		0.837
SZ-7	J19YC4	5/18/10	6.58		0.378	62.0		0.486	0.193	B	0.194	1.18	B	1.94	0.0522	B	0.243	11.7		0.971	5.82		2.91	13.3		1.94	17.3		0.971	272		0.971
SZ-8	J19YC5	5/18/10	4.84		0.753	62.2		0.377	0.206		0.151	1.34	B	1.51	0.101	B	0.188	12.6		0.753	5.65		2.26	12.0		1.51	15.1		0.753	270		0.753
SZ-9 re-sample 1*	J1FKL4	3/16/11	4.80		0.630	69.6		0.073	0.110	BM	0.032	1.00	B	0.940	0.0740	BM	0.0390	9.90	X	0.055	8.60	X	0.095	17.3		0.21	8.00		0.260	284	X	0.095
SZ-10	J19YC7	5/18/10	7.65		0.678	54.8		33.9	0.181		0.136	0.967	B	1.36	0.0594	B	0.170	10.2		0.678	5.60		2.04	14.3		1.36	24.2		0.678	266		0.678
SZ-11 re-sample 1*	J1FKL6	3/16/11	1.10		0.580	43.0		0.066	0.029	U	0.029	0.860	U	0.860	0.0700	B	0.0360	5.3	X	0.051	7.80	X	0.087	14.5		0.19	2.30		0.240	234	X	0.087
SZ-12	J19YC9	5/18/10	3.06		0.859	50.7		0.430	0.155	B	0.172	1.00	B	1.72	0.105	B	0.215	13.1		0.859	5.38		2.58	12.5		1.72	5.80		0.859	251		0.859

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
SZ-2	J19YB9/ J19YD0	5/18/10	4.13	64.0	0.248	1.17	0.0933	18.6	5.88	12.0	5.04	267
SZ-1	J19YB8	5/18/10	2.13	33.6	0.130	0.759	0.0410	8.9	4.91	12.2	3.44	227
SZ-3	J19YC0	5/18/10	2.83	69.8	0.208	3.44	0.0861	12.7	5.79	13.1	8.37	268
SZ-4	J19YC1	5/18/10	5.32	51.9	0.172	1.26	0.0649	10.4	6.11	16.1	15.2	257
SZ-5	J19YC2	5/18/10	6.45	46.7	0.192	1.12	0.0602	11.0	5.46	13.0	15.9	263
SZ-6	J19YC3	5/18/10	3.8	63.4	0.216	1.26	0.0586	12.8	6.41	12.8	8.41	274
SZ-7	J19YC4	5/18/10	6.68	52.0	0.193	1.18	0.0522	11.7	5.82	13.3	17.3	272
SZ-8	J19YC5	5/18/10	4.84	62.2	0.206	1.34	0.101	12.6	5.65	12.0	15.1	270
SZ-9 re-sample 1*	J1FKL4	3/16/11	4.80	69.6	0.110	1.00	0.0740	9.90	6.60	17.3	8.00	284
SZ-10	J19YC7	5/18/10	7.65	54.8	0.181	0.967	0.0594	10.2	5.60	14.3	24.2	268
SZ-11 re-sample 1*	J1FKL5	3/16/11	1.10	43.0	0.015	0.430	0.0700	5.30	7.80	14.5	2.30	234
SZ-12	J19YC9	5/18/10	3.08	50.7	0.155	1.00	0.106	13.1	5.38	12.5	5.80	251

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	8%	8%	0%	0%	0%	0%	0%	0%
Mean	4.39	55.1	0.189	1.24	0.0721	11.4	6.93	13.6	10.59	261
Standard deviation	1.94	11.0	0.0615	0.736	0.0202	3.12	0.884	1.68	6.76	16.6
95% UCL on mean	6.53	62.4	0.198	1.59	0.0853	12.9	6.30	14.4	18.8	269
Maximum value	7.65	69.8	0.263	3.44	0.105	21.2	7.60	17.3	24.2	284
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NO	NA	NA	YES	NA
> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NO	NA	NA	YES	NA
Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NO	NA	NA	YES	NA
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 6 of 47

116-H-5 Statistical Calculations

Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.294	B	0.907	15.6		2.27	52.6		0.91	37.8		2.72
Duplicate of J19YB9	J19YD0	5/18/10	0.243	B	0.695	12.2		1.74	43.7		0.70	33.9		2.09
SZ-1	J19YB8	5/18/10	0.252	B	0.742	8.94		1.86	42.9		0.74	29.0		2.23
SZ-3	J19YC0	5/18/10	0.271	B	0.801	10.9		2.00	47.0		0.80	68.7		2.40
SZ-4	J19YC1	5/18/10	0.276	B	0.902	9.84		2.25	46.8		0.90	38.0		2.71
SZ-5	J19YC2	5/18/10	0.233	B	0.767	10.0		1.92	46.1		0.77	33.4		2.30
SZ-6	J19YC3	5/18/10	0.321	B	0.837	10.8		2.09	52.8		0.84	39.2		2.51
SZ-7	J19YC4	5/18/10	0.260	B	0.971	10.0		2.43	49.4		0.97	35.8		2.91
SZ-8	J19YC5	5/18/10	0.252	B	0.753	10.2		1.88	45.2		0.75	69.8		2.26
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.250	U	0.250	11.1	X	0.12	42.6		0.090	35.2	X	0.38
SZ-10	J19YC7	5/18/10	0.250	B	0.678	9.63		1.70	45.4		0.68	34.8		2.04
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.230	U	0.230	11.5	X	0.11	47.4		0.082	34.3	X	0.35
SZ-12	J19YC9	5/18/10	0.298	B	0.859	12.5		2.15	46.6		0.66	36.5		2.68

Sample Area	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL	Benzo(ghi)perylene ug/kg	Q	PQL	Benzo(k)fluoranthene ug/kg	Q	PQL	Chrysene ug/kg	Q	PQL
SZ-2	3.87	U	3.87	3.87	U	3.67	1.16	J	3.87	3.87	U	3.67	3.87	U	3.87	3.87	U	3.87
Duplicate of J19YB9	0.858	J	3.43	1.20	J	3.43	1.54	J	3.43	1.03	J	3.43	3.43	U	3.43	3.43	U	3.43
SZ-1	1.05	J	3.51	3.51	U	3.51	0.878	J	3.51	3.51	U	3.51	3.51	U	3.51	1.05	J	3.51
SZ-3	4.71		3.36	5.05		3.36	6.73		3.36	3.87		3.36	2.52	J	3.36	5.38		3.36
SZ-4	7.32		3.48	6.97		3.48	11.3		3.48	3.48	U	3.48	3.49		3.48	8.37		3.48
SZ-5	8.99		3.52	8.99		3.52	9.17		3.52	6.52		3.52	3.88		3.52	11.5		3.52
SZ-6	3.11	J	3.45	3.98		3.45	7.95		3.45	3.63		3.45	1.73	J	3.45	2.94	J	3.45
SZ-7	11.2		3.49	11.4		3.49	18.4		3.49	10.1		3.49	5.77		3.49	16.4		3.49
SZ-8	6.59		3.46	6.15		3.46	12.0		3.46	9.36		3.46	3.99		3.46	4.68		3.46
SZ-9 re-sample 1[a]	10.0	J	3.40	11.0	J	6.80	5.70	JX	4.40	7.60	U	7.60	5.80	J	4.20	10.0	J	5.10
SZ-10	15.5		3.43	15.8		3.43	24.9		3.43	23.4		3.43	8.59		3.43	12.2		3.43
SZ-11 re-sample 1[a]	23.0		3.20	18.0		6.40	20.0		4.20	7.20	U	7.20	10.0	J	4.00	18.0	J	4.80
SZ-12	3.40	U	3.40	1.19	J	3.40	1.19	J	3.40	3.40	U	3.40	3.40	U	3.40	0.851	J	3.40

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg
SZ-2	J19YB9/ J19YD0	5/18/10	0.269	13.9	48.2	35.9
SZ-1	J19YB8	5/18/10	0.252	8.94	42.9	29.0
SZ-3	J19YC0	5/18/10	0.271	10.9	47.0	68.7
SZ-4	J19YC1	5/18/10	0.276	9.84	46.8	38.0
SZ-5	J19YC2	5/18/10	0.233	10.0	46.1	33.4
SZ-6	J19YC3	5/18/10	0.321	10.8	52.8	39.2
SZ-7	J19YC4	5/18/10	0.260	10.0	49.4	35.8
SZ-8	J19YC5	5/18/10	0.252	10.2	45.2	69.8
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.125	11.1	42.6	35.2
SZ-10	J19YC7	5/18/10	0.250	9.63	45.4	34.8
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.115	11.5	47.4	34.3
SZ-12	J19YC9	5/18/10	0.298	12.5	46.6	35.5

Sample Area	Benzo(a)anthracene ug/kg	Benzo(a)pyrene ug/kg	Benzo(b)fluoranthene ug/kg	Benzo(ghi)perylene ug/kg	Benzo(k)fluoranthene ug/kg	Chrysene ug/kg
SZ-2	1.40	1.57	1.35	1.48	1.83	1.83
SZ-1	1.05	1.76	0.88	1.76	1.76	1.05
SZ-3	4.71	5.05	6.73	3.87	2.52	5.38
SZ-4	7.32	6.97	11.3	1.74	3.49	8.37
SZ-5	8.99	8.99	9.17	6.52	3.88	11.5
SZ-6	3.11	3.98	7.95	3.63	1.73	2.94
SZ-7	11.2	11.4	18.4	10.1	5.77	16.4
SZ-8	6.59	6.15	12.0	9.36	3.99	4.68
SZ-9 re-sample 1[a]	10.0	11.0	5.70	3.80	5.80	10.0
SZ-10	15.5	15.8	24.9	23.4	8.59	12.2
SZ-11 re-sample 1[a]	23.0	18.0	20.0	3.60	10.0	18.0
SZ-12	1.70	1.19	1.19	1.70	1.70	0.851

Statistical Computations

	Molybdenum		Nickel		Vanadium		Zinc	
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	
N	12		12		12		12	
% < Detection limit	17%		0%		0%		0%	
Mean	0.243		10.8		46.7		40.8	
Standard deviation	0.0622		1.36		2.74		13.5	
95% UCL on mean	0.273		11.5		48.2		47.2	
Maximum value	0.321		15.6		52.8		69.8	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	8	GW Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NO		NA		NA		NO	
> 10% above Cleanup Limit?	NO		NA		NA		YES	
Any sample > 2X Cleanup Limit?	NO		NA		NA		NO	
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	

	Benzo(a)anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene		Benzo(ghi)perylene		Benzo(k)fluoranthene		Chrysene	
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat normal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
N	12		12		12		12		12		12	
% < Detection limit	8%		8%		0%		42%		25%		8%	
Mean	7.88		7.82		10.0		5.91		4.26		7.77	
Standard deviation	6.50		5.52		7.79		6.23		2.79		5.92	
95% UCL on mean	20.8		16.8		14.0		11.7		6.75		23.6	
Maximum value	23.0		18.0		24.9		23.4		10.0		18.0	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	15 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	48000 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	100 ug/kg	GW & River Protection
WAC 173-340 3-PART TEST												
95% UCL > Cleanup Limit?	YES		YES		NO		NO		NO		NO	
> 10% above Cleanup Limit?	YES		YES		YES		NO		NO		NO	
Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO		NO	
WAC 173-340 Compliance?	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 9 of 47

1 **116-H-5 Statistical Calculations**
2 **Verification Data -Shallow Zone**

#	Sample	Sample	Sample	Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in Nitrite and Nitrate			Sulfate			TPH-motor oil (high boiling)		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
5	SZ-2	J19YB9	5/18/10	3.87	U	3.87	3.87	U	3.87	1.16	J	3.87	3.87	U	3.87	0.70	B	2.8	0.59	JB	0.63	0.49		0.22	2.6	B	2.8	11500	UJ	11500
6	Duplicate of J19YB9	J19YD0	5/18/10	2.57	J	3.43	3.43	U	3.43	1.20	J	3.43	3.43	U	3.43	0.80	B	2.5	0.84		0.66	0.62		0.19	3.2		2.6	10200	U	10200
7	SZ-1	J19YB8	5/18/10	2.46	J	3.51	3.51	U	3.51	1.58	J	3.51	1.23	J	3.51	0.50	B	2.6	0.84	J	0.59	1.4		0.22	3.2		2.6	10500	UJ	10500
8	SZ-3	J19YC0	5/18/10	21.4		3.36	4.54		3.36	7.57		3.36	14.5		3.36	0.70	B	2.2	0.18	JB	0.50	0.16	B	0.19	1.9	B	2.2	27600	J	9940
9	SZ-4	J19YC1	5/18/10	19.9		3.48	7.15		3.46	5.93		3.48	17.3		3.48	0.80	B	2.6	1.06	J	0.59	0.69		0.22	4.6		2.6	4760	J	10300
10	SZ-5	J19YC2	5/18/10	31.2		3.52	6.70		3.62	11.6		3.52	23.1		3.52	0.40	B	2.5	1.81	J	0.56	1.17		0.21	5.4		2.5	10600	UJ	10600
11	SZ-6	J19YC3	5/18/10	9.34		3.45	5.01		3.45	3.98		3.45	6.40		3.45	0.40	B	2.6	1.94	J	0.59	1.03		0.22	10.2		2.6	4330	J	10000
12	SZ-7	J19YC4	5/18/10	27.1		3.49	9.97		3.49	10.5		3.49	29.4		3.49	0.90	B	2.5	0.75	J	0.56	0.87		0.20	6.2		2.5	4900	J	10400
13	SZ-8	J19YC5	5/18/10	25.0		3.46	8.32		3.46	9.88		3.46	16.5		3.46	0.90	B	2.5	3.37	J	0.66	2.43		0.20	14.3		2.6	3850	J	10300
	SZ-9	J19YC6	5/18/10																									29900	J	10200
14	SZ-9 re-sample 1[a]	J1FKL4	3/16/11	14.0	U	14.0	13.0	U	13.0	13.0	U	13.0	14.0	J	13.0	1.5	B	0.88	1.10	B	0.34	0.53	BMN	0.38	6.8		1.8			
15	SZ-10	J19YC7	5/18/10	38.5		3.43	16.8		3.43	10.8		3.43	39.4		3.43	0.50	B	2.4	2.08	J	0.54	1.88		0.22	9.3		2.4	4620	J	10200
	SZ-11	J19YC8	5/18/10																									6290	J	10300
16	SZ-11 re-sample 1[a]	J1FKL5	3/16/11	48.0		13.0	14.0	J	12.0	31.0	J	12.0	47.0		12.0	0.81	U	0.81	0.40	B	0.31	0.37	U	0.37	2.1	B	1.7			
17	SZ-12	J19YC9	5/18/10	3.06	J	3.4	3.40	U	3.40	1.53	J	3.4	3.40	U	3.40	2.3	U	2.30	0.77		0.52	0.52		0.19	2.6		2.3	10200	U	10200

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19 **Statistical Computation Input Data**

#	Sample Area	Sample Number	Sample Date	Fluoranthene ug/kg	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg	Fluoride mg/kg	Nitrogen in Nitrate [b] mg/kg	Nitrogen in Nitrite and Nitrate mg/kg	Sulfate mg/kg	TPH-motor oil (high boiling) ug/kg
22	SZ-2	J19YB9/ J19YD0	5/18/10	2.25	1.83	1.18	1.83	0.75	0.71	0.56	2.9	5425
23	SZ-1	J19YB8	5/18/10	2.46	1.76	1.58	1.23	0.50	0.84	1.40	3.2	5250
24	SZ-3	J19YC0	5/18/10	21.4	4.54	7.57	14.5	0.70	0.18	0.15	1.9	27600
25	SZ-4	J19YC1	5/18/10	19.9	7.15	5.93	17.3	0.80	1.06	0.69	4.6	4760
26	SZ-5	J19YC2	5/18/10	31.2	6.70	11.6	23.1	0.40	1.81	1.17	5.4	6300
27	SZ-6	J19YC3	5/18/10	9.34	5.01	3.98	6.40	0.40	1.94	1.03	10.2	4330
28	SZ-7	J19YC4	5/18/10	27.1	9.97	10.5	29.4	0.90	0.75	0.87	6.2	4900
29	SZ-8	J19YC5	5/18/10	25.0	8.32	9.88	16.5	0.90	3.37	2.43	14.3	3850
	SZ-9	J19YC6	5/18/10									29900
30	SZ-9 re-sample 1[a]	J1FKL4	3/16/11	7.00	6.60	6.50	14.0	1.50	1.10	0.53	5.8	
31	SZ-10	J19YC7	5/18/10	38.5	16.8	10.8	39.4	0.50	2.08	1.68	9.3	4620
	SZ-11	J19YC8	5/18/10									6290
32	SZ-11 re-sample 1[a]	J1FKL5	3/16/11	48.0	14.0	31.0	47.0	0.41	0.40	0.19	2.1	
33	SZ-12	J19YC9	5/18/10	3.06	1.70	1.53	1.70	1.15	0.77	0.52	2.6	5100

34 **Statistical Computations**

#		Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH-motor oil (high boiling)
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12
38	% < Detection limit	8%	33%	8%	17%	17%	0%	8%	0%	33%
39	Mean	19.6	7.0	8.5	17.7	0.74	1.25	0.92	5.7	8944
40	Standard deviation	15.1	4.8	8.0	14.9	0.34	0.90	0.66	3.8	9284
41	95% UCL on mean	66.6	13.6	21.7	25.4	0.98	2.44	1.90	9.2	13362
42	Maximum value	48.0	16.8	31.0	47.0	1.6	3.37	2.43	14.3	27600
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	18000 ug/kg River Protection	330 ug/kg GW & River Protection	240000 ug/kg GW Protection	48000 ug/kg GW Protection	96 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection	200000 ug/kg DE, GW & River Protection
44	**WAC 173-340 3-PART TEST**									
45	95% UCL > Cleanup Limit?	NO	NO	NO	NO	NA	NA	NA	NA	NO
46	> 10% above Cleanup Limit?	NO	NO	NO	NO	NA	NA	NA	NA	NO
47	Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NA	NA	NA	NA	NO
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
Sheet No. 10 of 47

116-H-5 Maximum Calculations
Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Hexavalent chromium			Mercury			Acenaphthene			Anthracene			Dibenz[a,h]anthracene			Fluorene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.230	U	0.230	0.015	B	0.030	3.87	U	3.87	3.87	U	3.87	3.87	U	3.87	3.87	U	3.87
Duplicate of J19YB9	J19YD0	5/18/10	0.210	U	0.210	0.027	U	0.027	3.43	U	3.43	3.43	U	3.43	3.43	U	3.43	3.43	U	3.43
SZ-1	J19YB8	5/18/10	0.060	B	0.210	0.026	U	0.026	3.51	U	3.51	3.51	U	3.51	3.51	U	3.51	3.51	U	3.51
SZ-3	J19YC0	5/18/10	0.200	U	0.200	0.019	B	0.030	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36
SZ-4	J19YC1	5/18/10	0.210	U	0.210	0.026	U	0.026	2.79	J	3.48	3.48	U	3.48	2.62	J	3.48	3.48	U	3.48
SZ-5	J19YC2	5/18/10	0.210	U	0.210	0.024	U	0.24	3.52	U	3.52	3.52	U	3.52	1.23	J	3.52	3.52	U	3.52
SZ-6	J19YC3	5/18/10	0.210	U	0.210	0.018	B	0.030	3.46	U	3.45	3.45	U	3.45	3.45	U	3.45	3.45	U	3.45
SZ-7	J19YC4	5/18/10	0.210	U	0.210	0.030	U	0.030	3.49	U	3.49	2.45	J	3.49	2.10	J	3.49	1.57	J	3.49
SZ-8	J19YC5	5/18/10	0.210	U	0.210	0.027	U	0.027	3.46	U	3.46	1.04	J	3.46	1.56	J	3.46	0.867	J	3.46
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.145	U	0.145	0.0054	U	0.0054	11.0	U	11.0	3.20	U	3.20	12.0	U	12.0	5.60	U	5.60
SZ-10	J19YC7	5/18/10	0.210	U	0.210	0.011	B	0.020	3.43	U	3.43	2.23	J	3.43	2.75	J	3.43	1.03	J	3.43
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.146	U	0.146	0.0060	U	0.0050	10.0	U	10.0	7.60	J	3.10	11.0	U	11.0	5.30	U	5.30
SZ-12	J19YC9	5/18/10	0.210	U	0.210	0.027	U	0.027	3.4	U	3.4	3.40	U	3.40	3.40	U	3.40	3.40	U	3.40

Statistical Computations

	Hexavalent chromium	Mercury	Acenaphthene	Anthracene	Dibenz[a,h]anthracene	Fluorene
% < Detection limit	92%	67%	92%	67%	58%	75%
Maximum value	0.060	0.019	2.79	7.60	2.75	1.57
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	2 River Protection	0.33 GW & River Protection	96000 ug/kg GW Protection	240000 ug/kg GW Protection	30 ug/kg GW & River Protection	64000 ug/kg GW Protection
3-PART TEST						
Maximum > Cleanup Limit?	NO	NA	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NA	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NA	NO	NO	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

116-H-5 Maximum Calculations
Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Naphthalene			Aroclor-1260			4,4'-DDE			TPH-diesel range			TPH-diesel range EXT			Chloride		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	3.87	U	3.87	14.6	U	14.6	1.46	UD	1.46	3830	U	3830				2.8	U	2.8
Duplicate of J19YB9	J19YD0	5/18/10	3.43	U	3.43	13.7	U	13.7	1.37	UD	1.37	3410	U	3410				2.5	U	2.5
SZ-1	J19YB8	5/18/10	3.51	U	3.51	13.8	U	13.8	1.38	UD	1.38	3490	U	3490				2.6	U	2.6
SZ-3	J19YC0	5/18/10	15.0		3.36	3.85	J	13.4	1.34	UD	1.34	3310	U	3310				2.2	U	2.2
SZ-4	J19YC1	5/18/10	3.48	U	3.48	13.8	U	13.8	1.39	UD	1.39	3430	U	3430				2.6	U	2.6
SZ-5	J19YC2	5/18/10	3.52	U	3.52	13.5	U	13.5	1.36	UD	1.35	3530	U	3530				2.5	U	2.5
SZ-6	J19YC3	5/18/10	3.45	U	3.45	13.7	U	13.7	1.37	UD	1.37	3350	U	3350				2.6	U	3.6
SZ-7	J19YC4	5/18/10	3.49	U	3.49	13.6	U	13.6	1.36	UD	1.36	3480	U	3480				2.5	U	2.5
SZ-8	J19YC5	5/18/10	3.46	U	3.46	13.7	U	13.7	1.37	UD	1.37	3440	U	3440				2.5	U	2.5
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	13.0	U	13.0	2.70	U	2.70	0.25	U	0.25	2600	J	720	8100		1100	2.1	B	2.1
SZ-10	J19YC7	5/18/10	3.43	U	3.43	13.5	U	13.5	1.36	UD	1.36	3410	U	3410				2.4	U	2.4
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	12.0	U	12.0	2.70	U	2.70	0.46	J	0.24	700	U	700	1200	J	1000	2.0	U	2.0
SZ-12	J19YC9	5/18/10	3.40	U	3.40	13.7	U	13.7	1.37	UD	1.37	3420	U	3420				2.3	U	2.3

Statistical Computations

	Naphthalene	Aroclor-1260	4,4'-DDE	TPH-diesel range	TPH-diesel range EXT	Chloride
% < Detection limit	92%	92%	92%	92%	0%	92%
Maximum value	15.0	3.85	0.45	2600	8100	2.1
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	16000 ug/kg GW Protection	17 ug/kg GW & River Protection	3.3 ug/kg River Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection	25000 GW Protection
3-PART TEST						
Maximum > Cleanup Limit?	NO	NO	NO	NO	NO	NA
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NA
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NA
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (100 mg/kg) the 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie

Project 100-H Field Remediation

Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11

Job No. 14655

Calc. No. 0100H-CA-V0164

Checked T. E. Queen

Rev. No. 0

Date 05/17/11

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116-H-5 Statistical Calculations

Verification Data -Deep Zone

Sample Area	Sample Number	Sample Date	Carbon-14			Cesium-137			Cobalt-60			Europium-152			Nickel-63			Tritium			Uranium-233/234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/10	0.718	UJ	0.918	0.069	U	0.069	0.086	U	0.086	0.174	U	0.174	0	U	2.87	4.53	J	2.71	0.766		0.279	0.620		0.279
Duplicate of J19YD1	J19YF3	5/18/10	0.903		0.883	0.074	U	0.074	0.085	U	0.085	0.192	U	0.192	0.440	U	2.98	0.202	U	3.10	0.667		0.181	0.543		0.181
DZ-2	J19YD2	5/18/10	0.203	UJ	0.850	0.089	U	0.089	0.082	U	0.082	0.240	U	0.240	0	U	3.03	2.13	UJ	2.60	0.318		0.244	0.510		0.244
DZ-3	J19YD3	5/18/10	1.23	J	0.881	0.095	U	0.095	0.108	U	0.108	0.230	U	0.230	0.524	U	3.17	1.79	UJ	2.58	0.380		0.242	0.570		0.242
DZ-4	J19YD4	5/18/10	0.534	UJ	0.841	0.078	U	0.078	0.103	U	0.103	0.209	U	0.209	0	U	3.02	2.55	UJ	2.64	0.395		0.202	0.501		0.202
DZ-5	J19YD5	5/18/10	0.267	UJ	0.961	0.056	U	0.056	0.068	U	0.068	0.162	U	0.162	0.0870	U	3.44	1.72	UJ	2.78	0.870		0.215	0.533		0.215
DZ-6	J19YD6	5/18/10	1.15	J	0.809	0.089	U	0.089	0.087	U	0.087	0.182	U	0.182	0	U	3.11	2.32	UJ	2.55	0.702		0.244	0.766		0.244
DZ-7	J19YD7	5/18/10	0.725	UJ	0.830	0.594		0.087	0.145		0.076	2.28		0.200	13.2		3.19	4.34	J	2.59	0.648		0.236	0.833		0.236
DZ-8	J19YD8	5/18/10	0.513	UJ	0.881	0.071	U	0.071	0.086	U	0.086	0.198	U	0.198	0	U	3.05	1.06	UJ	2.65	0.430		0.206	0.349		0.206
DZ-9	J19YD9	5/18/10	0.581	UJ	0.860	0.114	U	0.114	0.095	U	0.095	0.280	U	0.280	0	U	2.96	1.91	UJ	2.62	0.709		0.209	0.546		0.209
DZ-10	J19YF0	5/18/10	0.509	UJ	0.800	0.055	U	0.055	0.072	U	0.072	0.181	U	0.181	0.914	U	3.00	2.53	J	2.53	0.594		0.182	0.570		0.182
DZ-11	J19YF1	5/18/10	1.41		0.901	0.066	U	0.066	0.055	U	0.055	0.182	U	0.182	1.50	U	2.80	1.06	U	2.86	0.371		0.149	0.488		0.149
DZ-12	J19YF2	5/18/10	0.766	U	0.900	0.078	U	0.078	0.086	U	0.086	0.183	U	0.183	1.40	U	2.75	0.297	U	3.03	0.553		0.184	0.481		0.184

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Cesium-137 pCi/g	Cobalt-60 pCi/g	Europium-152 pCi/g	Nickel-63 pCi/g	Tritium pCi/g	Uranium-233/234 pCi/g	Uranium-238 pCi/g
DZ-1	J19YD1/ J19YF3	5/18/10	0.811	0.036	0.043	0.092	0.220	2.37	0.667	0.582
DZ-2	J19YD2	5/18/10	0.203	0.045	0	0.120	0	2.13	0.318	0.510
DZ-3	J19YD3	5/18/10	1.23	0.048	0	0.115	0.524	1.79	0.380	0.570
DZ-4	J19YD4	5/18/10	0.534	0.039	0.052	0.105	0	2.56	0.395	0.501
DZ-5	J19YD5	5/18/10	0.267	0.028	0.034	0.081	0.0870	1.72	0.870	0.533
DZ-6	J19YD6	5/18/10	1.15	0.045	0	0.091	0	2.32	0.702	0.766
DZ-7	J19YD7	5/18/10	0.725	0.594	0.145	2.28	13.2	4.34	0.648	0.833
DZ-8	J19YD8	5/18/10	0.513	0.036	0.043	0.099	0	1.06	0.430	0.349
DZ-9	J19YD9	5/18/10	0.581	0.057	0.048	0.140	0	1.91	0.709	0.546
DZ-10	J19YF0	5/18/10	0.509	0.028	0.036	0.091	0.914	2.53	0.594	0.570
DZ-11	J19YF1	5/18/10	1.41	0.033	0	0.091	1.50	1.06	0.371	0.488
DZ-12	J19YF2	5/18/10	0.766	0.039	0.043	0.092	1.40	0.297	0.553	0.481

Statistical Computations

	Carbon-14	Cesium-137	Cobalt-60	Europium-152	Nickel-63	Tritium	Uranium-233/234	Uranium-238
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
N	12	12	12	12	12	12	12	12
% < Detection limit	67%	92%	92%	92%	92%	75%	0%	0%
Mean	0.720	0.085	0.029	1.07	1.34	2.01	0.553	0.561
Standard deviation	0.375	0.160	0.034	0.629	3.73	1.00	0.173	0.126
Z-statistic	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
95% UCL on mean	0.898	0.161	0.045	1.37	3.11	2.49	0.635	0.622
Maximum value	1.41	0.594	0.145	2.28	13.2	4.53	0.870	0.833

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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1 116-H-5 Statistical Calculations

2 Verification Data -Deep Zone

				Arsenic			Barium			Beryllium			Cadmium			Chromium			Cobalt			Copper			Lead		
3/4	Sample Area	Sample Number	Sample Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	DZ-8 re-sample 2ª	J1HH85	4/13/11	6.0		0.60	43.4		0.069	0.12	B	0.030	0.14	B	0.037	12.8		0.063	5.3	X	0.091	18.5		0.20	14.3	X	0.25
6	Duplicate of J1HH85ª	J1HH86	4/13/11	6.7		0.64	42.1		0.074	0.13	B	0.032	0.19		0.040	15.1		0.056	5.4	X	0.097	16.2		0.21	17.3	X	0.26
7	DZ-1 re-sample 2ª	J1HH80	4/13/11	7.0		0.65	60.9		0.074	0.13	B	0.032	0.067	B	0.040	9.8		0.067	6.2	X	0.098	14.0		0.21	18.5	X	0.26
8	DZ-2 re-sample 2ª	J1HH81	4/13/11	2.5		0.61	57.7		0.070	0.063	B	0.031	0.046	B	0.038	6.2		0.064	6.4	X	0.093	15.3		0.20	4.2	X	0.25
9	DZ-3 re-sample 2ª	J1HH82	4/13/11	1.9		0.64	59.7		0.074	0.042	B	0.032	0.042	B	0.040	15.1		0.057	6.6	X	0.098	13.4		0.21	2.9	X	0.26
10	DZ-4 re-sample 2ª	J1HH83	4/13/11	4.8		0.63	68.3		0.073	0.16	B	0.032	0.081	B	0.039	12.9		0.056	6.3	X	0.096	14.4		0.21	11.4	X	0.26
11	DZ-5 re-sample 1ª	J1FKK5	3/16/11	9.8		0.63	35.5		0.072	0.031	U	0.031	0.039	U	0.039	7.6		0.055	5.1	X	0.095	12.8		0.21	31.3		0.26
12	DZ-6 re-sample 1ª	J1FKK6	3/16/11	1.8		0.59	50.3		0.068	0.030	U	0.030	0.062	B	0.037	7.2		0.052	5.5	X	0.090	15.4		0.19	8.4		0.24
13	DZ-7 re-sample 2ª	J1HH84	4/13/11	4.2		0.69	34.7		0.079	0.098	B	0.034	0.055	B	0.043	8.8		0.060	4.7	X	0.10	11.7		0.23	11.3	X	0.28
14	DZ-9 re-sample 1ª	J1FKK9	3/16/11	1.1		0.62	77.1		0.072	0.031	U	0.031	0.039	U	0.039	6.5		0.055	5.5	X	0.095	12.7		0.21	3.5		0.26
15	DZ-10 re-sample 1ª	J1FKL0	3/16/11	2.4		0.65	57.4		0.075	0.033	U	0.033	0.041	U	0.041	8.7		0.057	5.7	X	0.098	13.6		0.21	6.0		0.27
16	DZ-11 re-sample 1ª	J1FKL1	3/16/11	2.8		0.67	69.0		0.077	0.074	B	0.034	0.042	U	0.042	11.6		0.059	6.4	X	0.10	15.9		0.22	8.4		0.27
17	DZ-12 re-sample 1ª	J1FKL2	3/16/11	3.2		0.68	90.3		0.078	0.034	U	0.034	0.064	B	0.042	8.3		0.060	6.7	X	0.10	15.8		0.22	9.8		0.28

19 Statistical Computation Input Data

20/21	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg
22	DZ-8 re-sample 2ª	J1HH85/ J1HH86	4/13/11	6.4	42.8	0.125	0.17	14.0	5.4	17.4	15.8
23	DZ-1 re-sample 2ª	J1HH80	4/13/11	7.0	60.9	0.130	0.067	9.80	6.2	14.0	18.5
24	DZ-2 re-sample 2ª	J1HH81	4/13/11	2.5	57.7	0.063	0.046	6.20	6.4	15.3	4.2
25	DZ-3 re-sample 2ª	J1HH82	4/13/11	1.9	59.7	0.042	0.042	15.1	6.6	13.4	2.9
26	DZ-4 re-sample 2ª	J1HH83	4/13/11	4.8	68.3	0.160	0.081	12.9	6.3	14.4	11.4
27	DZ-5 re-sample 1ª	J1FKK5	3/16/11	9.8	35.5	0.016	0.020	7.60	5.1	12.8	31.3
28	DZ-6 re-sample 1ª	J1FKK6	3/16/11	1.8	50.3	0.015	0.062	7.20	5.5	15.4	8.4
29	DZ-7 re-sample 2ª	J1HH84	4/13/11	4.2	34.7	0.098	0.065	8.80	4.7	11.7	11.3
30	DZ-9 re-sample 1ª	J1FKK9	3/16/11	1.1	77.1	0.016	0.020	6.50	5.5	12.7	3.5
31	DZ-10 re-sample 1ª	J1FKL0	3/16/11	2.4	57.4	0.017	0.021	8.70	5.7	13.6	6.0
32	DZ-11 re-sample 1ª	J1FKL1	3/16/11	2.8	69.0	0.074	0.021	11.6	6.4	15.9	8.4
33	DZ-12 re-sample 1ª	J1FKL2	3/16/11	3.2	90.3	0.017	0.064	8.30	6.7	15.8	9.8

34 Statistical Computations

35		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	42%	33%	0%	0%	0%	0%
39	Mean	4.0	58.6	0.064	0.054	9.72	5.9	14.4	11.0
40	Standard deviation	2.6	16.5	0.053	0.041	2.98	0.65	1.63	7.98
41	95% UCL on mean	6.3	69.8	0.089	0.089	11.6	6.2	15.3	18.7
42	Maximum value	9.8	90.3	0.160	0.19	15.1	6.7	18.5	31.3
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 GW & River Protection	200 GW Protection	1.51 GW & River Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection
44	WAC 173-340 3-PART TEST								
45	95% UCL > Cleanup Limit?	NO	NA	NA	NA	NA	NA	NA	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NA	NA	NA	NA	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NA	NA	NA	NA	YES
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie — Date 05/17/11 — Calc. No. 0100H-CA-V0164 — Rev. No. 0

Project 100-H Field Remediation — Job No. 14655 — Checked T. E. Queen — Date 05/17/11

Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 13 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Deep Zone**

3	Sample	Sample	Sample	Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl)phthalate			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in nitrate and nitrite		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	DZ-8 re-sample 2[a]	J1HH85	4/13/11	221		0.091	9.9	X	0.11	35.9		0.086	60.8		0.36	69	JB	47	0.9	B	2.3	2.78	J	0.52	1.70		0.21
6	Duplicate of J1HH85[a]	J1HH86	4/13/11	228		0.097	11.3	X	0.12	37.1		0.091	77.2		0.39	83	JB	47	1.2	B	2.4	2.64		0.64	1.62		0.22
7	DZ-1 re-sample 2[a]	J1HH80	4/13/11	283		0.098	10.6	X	0.12	40.3		0.092	39.0		0.39	94	JB	48	0.6	B	2.2	1.02	J	0.50	0.68		0.22
8	DZ-2 re-sample 2[a]	J1HH81	4/13/11	252		0.093	8.1	X	0.11	48.7		0.087	35.5		0.37	80	JB	47	0.7	B	2.4	56.8	JD	2.76	43.4	D	2.12
9	DZ-3 re-sample 2[a]	J1HH82	4/13/11	231		0.098	12.8	X	0.12	56.4		0.092	34.4		0.39	72	JB	46	0.9	B	2.6	26.7	JD	1.20	22.7	D	1.03
10	DZ-4 re-sample 2[a]	J1HH83	4/13/11	261		0.096	11.5	X	0.12	41.9		0.090	38.9		0.38	89	JB	45	1.7	B	2.5	2.26	J	0.56	1.40		0.22
11	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	209		0.095	10.1	X	0.12	33.6		0.089	27.4	X	0.38	48	U	48	1.0	B	2.4	7.59	J	0.54	5.36		0.22
12	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	217		0.090	9.2	X	0.11	39.4		0.084	31.6	X	0.36	47	U	47	2.6	U	2.6	5.38	J	0.59	5.67		0.23
13	DZ-7 re-sample 2[a]	J1HH84	4/13/11	206		0.10	12.2	X	0.13	30.5		0.098	29.6		0.41	78	JB	48	0.6	B	2.6	1.13	J	0.56	0.79		0.23
14	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	219		0.095	6.8	X	0.12	47.9		0.089	30.9	X	0.38	45	U	45	0.3	B	2.4	0.79	J	0.54	0.63		0.21
15	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	230		0.099	9.2	X	0.12	35.4		0.093	31.3	X	0.39	47	U	47	0.4	B	2.5	3.19	J	0.58	2.08		0.21
16	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	260		0.10	13.5	X	0.13	40.9		0.096	44.7	X	0.41	51	U	51	1.1	B	2.5	4.02		0.56	2.94		0.22
17	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	284		0.10	11.3	X	0.13	54.7		0.097	46.2	X	0.41	48	U	48	1.1	B	2.3	5.11		0.52	4.37		0.20

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Nickel	Vanadium	Zinc	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in nitrate and nitrite
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	mg/kg	mg/kg	mg/kg
22	DZ-8 re-sample 2[a]	J1HH85/ J1HH86	4/13/11	225	10.6	36.5	69.0	76	1.1	2.71	1.66 *
23	DZ-1 re-sample 2[a]	J1HH80	4/13/11	283	10.6	40.3	39.0	94	0.6	1.02	0.66
24	DZ-2 re-sample 2[a]	J1HH81	4/13/11	252	8.10	48.7	36.5	80	0.7	56.8	43.4
25	DZ-3 re-sample 2[a]	J1HH82	4/13/11	231	12.8	56.4	34.4	72	0.9	26.7	22.7
26	DZ-4 re-sample 2[a]	J1HH83	4/13/11	261	11.5	41.9	38.9	89	1.7	2.26	1.40
27	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	209	10.1	33.6	27.4	24	1.0	7.59	5.36
28	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	217	9.20	39.4	31.6	24	1.3	5.38	5.67
29	DZ-7 re-sample 2[a]	J1HH84	4/13/11	206	12.2	30.5	29.6	78	0.6	1.13	0.79
30	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	219	6.80	47.9	30.9	23	0.3	0.79	0.63
31	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	230	9.20	35.4	31.3	24	0.4	3.19	2.08
32	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	260	13.5	40.9	44.7	26	1.1	4.02	2.94
33	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	284	11.3	54.7	46.2	24	1.1	5.11	4.37

34 **Statistical Computations**

35		Manganese	Nickel	Vanadium	Zinc	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in nitrate and nitrite
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	50%	8%	0%	0%
39	Mean	240	10.5	42.2	38.2	53	0.9	9.64	7.64
40	Standard deviation	27	1.95	8.2	11.3	31	0.4	16.1	12.8
41	95% UCL on mean	255	11.7	47.0	43.6	67	1.3	34.0	31.3
42	Maximum value	284	13.6	56.4	77.2	94	1.7	55.8	43.4
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	512 GW & River Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	360 ug/kg River Protection	96.0 GW Protection	1000 GW Protection	1000 GW Protection
44	WAC 173-340 3-PART TEST								
45	95% UCL > Cleanup Limit?	NA	NA	NA	NO	NO	NA	NO	NO
46	> 10% above Cleanup Limit?	NA	NA	NA	NO	NO	NA	NO	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	NO	NO	NA	NO	NO
48	WAC 173-340 Compliance?	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 14 of 47

1 **116-H-5 Statistical Calculations**
2 **Verification Data -Deep Zone**

	Sample Area	Sample Number	Sample Date	Sulfate mg/kg	Sulfate Q	Sulfate PQL	TPH-motor oil (high boiling) ug/kg	TPH Q	TPH PQL
5	DZ-8 re-sample 2[a]	J1HH85	4/13/11	7.6		2.3	5670	J	10200
6	Duplicate of J1HH85[a]	J1HH86	4/13/11	8.4		2.4	3480	J	10400
7	DZ-1 re-sample 2[a]	J1HH80	4/13/11	4.9		2.2	10400	UJ	10400
8	DZ-2 re-sample 2[a]	J1HH81	4/13/11	160	JD	12.2	10600	UJ	10600
9	DZ-3 re-sample 2[a]	J1HH82	4/13/11	101		2.6	10300	UJ	10300
10	DZ-4 re-sample 2[a]	J1HH83	4/13/11	8.1		2.5	9290	J	10400
11	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	17.6		2.4	10500	UJ	10500
12	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	19.2		2.6	127000	J	10500
13	DZ-7 re-sample 2[a]	J1HH84	4/13/11	10.3		2.5	4230	J	10300
14	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	5.8		2.4	18700	J	10400
15	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	11.3		2.5	6750	J	10400
16	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	18.6		2.5	6760	J	10500
17	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	25.3		2.3	8670	J	10100

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19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Sulfate mg/kg	TPH-motor oil (high boiling) ug/kg
22	DZ-8 re-sample 2[a]	J1HH85/ J1HH86	4/13/11	8 1	4575
23	DZ-1 re-sample 2[a]	J1HH80	4/13/11	4.9	5200
24	DZ-2 re-sample 2[a]	J1HH81	4/13/11	160	5300
25	DZ-3 re-sample 2[a]	J1HH82	4/13/11	101	5150
26	DZ-4 re-sample 2[a]	J1HH83	4/13/11	8.1	9290
27	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	17.6	5250
28	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	19.2	127000
29	DZ-7 re-sample 2[a]	J1HH84	4/13/11	10.3	4230
30	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	5.8	18700
31	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	11.3	6750
32	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	18.6	6760
33	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	25.3	8670

34 **Statistical Computations**

		Sulfate		TPH-motor oil (high boiling)	
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	
37	N	12		12	
38	% < Detection limit	0%		33%	
39	Mean	32.5		17240	
40	Standard deviation	47.9		34789	
41	95% UCL on mean	55.2		33760	
42	Maximum value	160		127000	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	25000	GW Protection	200000 ug/kg	GW & River Protection
44	**WAC 173-340 3-PART TEST**				
45	95% UCL > Cleanup Limit?	NA		NO	
46	> 10% above Cleanup Limit?	NA		NO	
47	Any sample > 2X Cleanup Limit?	NA		NO	
48	**WAC 173-340 Compliance?**	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 15 of 47

1 **116-H-5 Maximum Calculations**
2 **Verification Data -Deep Zone**

	Sample Area	Sample Number	Sample Date	Boron			Mercury			Molybdenum			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene		
4				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	DZ-8 re-sample 2[a]	J1HH85	4/13/11	0.90	U	0.90	0.019		0.0050	0.24	U	0.24	3.0	U	3.0	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
6	Duplicate of J1HH85[a]	J1HH86	4/13/11	0.95	U	0.95	0.020		0.0050	0.25	U	0.25	3.1	U	3.1	3.2	U	3.2	6.5	U	6.5	4.3	U	4.3
7	DZ-1 re-sample 2[a]	J1HH80	4/13/11	1.2	B	0.96	0.0055	U	0.0055	0.25	U	0.26	5.1	J	3.3	32		3.4	27		6.9	27		4.5
8	DZ-2 re-sample 2[a]	J1HH81	4/13/11	0.91	U	0.91	0.0051	U	0.0051	0.24	U	0.24	3.1	U	3.1	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
9	DZ-3 re-sample 2[a]	J1HH82	4/13/11	0.96	U	0.96	0.0053	U	0.0053	0.25	U	0.25	3.0	U	3.0	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1
10	DZ-4 re-sample 2[a]	J1HH83	4/13/11	0.94	U	0.94	0.0057	U	0.0057	0.87	B	0.25	3.1	U	3.1	54		3.2	41		6.4	51		4.2
11	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	0.93	U	0.93	0.0056	U	0.0056	0.25	U	0.26	3.2	U	3.2	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3
12	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	0.88	U	0.88	0.0057	U	0.0057	0.23	U	0.23	3.1	U	3.1	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3
13	DZ-7 re-sample 2[a]	J1HH84	4/13/11	1.0	U	1.0	0.0063	U	0.0063	0.27	U	0.27	3.4	U	3.4	3.6	U	3.6	11	J	7.2	8.2	J	4.7
14	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	0.93	U	0.93	0.0055	U	0.0055	0.25	U	0.25	3.0	U	3.0	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
15	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	0.97	U	0.97	0.0054	U	0.0054	0.26	U	0.26	3.1	U	3.1	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
16	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	1.0	U	1.0	0.0060	U	0.0060	0.26	U	0.26	3.3	U	3.3	3.5	U	3.5	7.0	U	7.0	4.6	U	4.6
17	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	1.0	U	1.0	0.0052	U	0.0052	0.27	U	0.27	3.1	U	3.1	3.2	U	3.2	6.5	U	6.5	4.2	U	4.2

18
19 **Statistical Computations**

20		Boron		Mercury		Molybdenum		Anthracene		Benzo(a)anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene	
21	% < Detection limit	92%		92%		92%		92%		83%		75%		75%	
22	Maximum value	1.2		0.020		0.87		6.1		54		41		51	
23	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	320	GW Protection	0.33	GW & River Protection	8	GW Protection	240000 ug/kg	GW Protection	15 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection
24	**3-PART TEST**														
25	Maximum > Cleanup Limit?	NO		NA		NO		NO		YES		YES		YES	
26	> 10% above Cleanup Limit?	NO		NA		NO		NO		YES		YES		YES	
27	Any sample > 2X Cleanup Limit?	NO		NA		NO		NO		YES		YES		YES	
28	**3-Part Test Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (0.33 mg/kg) the 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		A detailed assessment will be performed.		A detailed assessment will be performed.		A detailed assessment will be performed.	

1 **116-H-5 Maximum Calculations**
2 **Verification Data -Deep Zone**

	Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
4				ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	DZ-8 re-sample 2[a]	J1HH85	4/13/11	7.1	U	7.1	3.9	U	3.9	4.8	U	4.8	13	U	13	12	U	12	12	U	12	12	U	12
6	Duplicate of J1HH85[a]	J1HH86	4/13/11	7.3	U	7.3	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12
7	DZ-1 re-sample 2[a]	J1HH80	4/13/11	16	J	7.7	13	J	4.2	26	J	5.2	43		14	19	J	13	18	J	13	48		13
8	DZ-2 re-sample 2[a]	J1HH81	4/13/11	7.2	U	7.2	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12
9	DZ-3 re-sample 2[a]	J1HH82	4/13/11	7.1	U	7.1	3.9	U	3.9	4.8	U	4.8	13	U	13	12	U	12	12	U	12	12	U	12
10	DZ-4 re-sample 2[a]	J1HH83	4/13/11	32		7.2	30		4.0	45		4.9	69		13	35		12	17	J	12	77		12
11	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	7.4	U	7.4	4.1	U	4.1	5.0	U	5.0	13	U	13	12	U	12	12	U	12	12	U	12
12	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	7.4	U	7.4	4.1	U	4.1	5.0	U	5.0	13	U	13	12	U	12	12	U	12	12	U	12
13	DZ-7 re-sample 2[a]	J1HH84	4/13/11	8.1	U	8.1	5.8	J	4.4	8.6	J	5.4	15	U	15	13	U	13	13	U	13	15	J	13
14	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	7.2	U	7.2	3.9	U	3.9	4.8	U	4.8	13	U	13	12	U	12	12	U	12	12	U	12
15	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	7.2	U	7.2	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12
16	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	7.8	U	7.8	4.3	U	4.3	5.3	U	5.3	14	U	14	13	U	13	13	U	13	13	U	13
17	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	7.3	U	7.3	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12

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19 **Statistical Computations**

20		Benzo(ghi)perylene		Benzo(k)fluoranthene		Chrysene		Fluoranthene		Indeno(1,2,3-cd)pyrene		Phenanthrene		Pyrene	
21	% < Detection limit	83%		75%		75%		83%		83%		83%		75%	
22	Maximum value	32		30		45		69		35		18		77	
23	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	48000 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	100 ug/kg	GW & River Protection	18000 ug/kg	River Protection	330 ug/kg	GW & River Protection	240000 ug/kg	GW Protection	48000 ug/kg	GW Protection
24	**3-PART TEST**														
25	Maximum > Cleanup Limit?	NO		YES		NO		NO		NO		NO		NO	
26	> 10% above Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO	
27	Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO		NO		NO	
28	**3-Part Test Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.		A detailed assessment will be performed.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

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MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0164 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 16 of 47

116-H-5 Maximum Calculations

Verification Data -Deep Zone

Sample Area	Sample Number	Sample Date	Aroclor-1260			4,4'-DDD			4,4'-DDT			Chloride			Nitrogen in nitrite [b]		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/10	13.7	U	13.7	1.37	UD	1.37	1.37	UD	1.37	2.3	U	2.3	0.70	UR	0.70
Duplicate of J19YD1	J19YF3	5/18/10	13.8	U	13.8	1.39	UD	1.39	1.39	UD	1.39	2.4	U	2.4	0.73	U	0.73
DZ-2	J19YD2	5/18/10	13.1	U	13.1	1.31	UD	1.31	1.31	UD	1.31	2.2	U	2.2	0.67	UR	0.67
DZ-3	J19YD3	5/18/10	7.31	J	13.9	2.12	JD	1.39	3.1	JD	1.39	17.6		2.4	0.40	JB	0.73
DZ-4	J19YD4	5/18/10	13.8	U	13.8	1.39	UD	1.39	1.39	UD	1.39	5.1		2.6	0.79	UR	0.79
DZ-5	J19YD5	5/18/10	13.3	U	13.3	1.33	UD	1.33	1.33	UD	1.33	2.5	U	2.5	0.76	UR	0.76
DZ-6	J19YD6	5/18/10	13.9	U	13.9	1.4	UD	1.4	1.4	UD	1.4	2.4	U	2.4	0.73	UR	0.73
DZ-7	J19YD7	5/18/10	6.28	J	13.8	1.38	UD	1.38	1.38	UD	1.38	2.6	U	2.6	0.79	UR	0.79
DZ-8	J19YD8	5/18/10	14	U	14	1.4	UD	1.4	1.4	UD	1.4	2.5	U	2.5	0.76	UR	0.76
DZ-9	J19YD9	5/18/10	13.4	U	13.4	1.34	UD	1.34	1.34	UD	1.34	2.4	U	2.4	0.73	UR	0.73
DZ-10	J19YF0	5/18/10	13.8	UJ	13.8	1.39	UD	1.39	1.39	UD	1.39	2.5	U	2.5	0.76	UR	0.76
DZ-11	J19YF1	5/18/10	14.1	U	14.1	1.41	UD	1.41	1.41	UD	1.41	2.5	U	2.5	0.76	U	0.76
DZ-12	J19YF2	5/18/10	13.7	U	13.7	1.37	UD	1.37	1.37	UD	1.37	2.9		2.3	0.70	U	0.70

Statistical Computations

	Aroclor-1260	4,4'-DDD	4,4'-DDT	Chloride	Nitrogen in nitrite [b]
% < Detection limit	83%	92%	92%	75%	92%
Maximum value	7.31	2.12	3.10	17.6	0.40
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	17 ug/kg GW & River Protection	3.3 ug/kg River Protection	3.3 ug/kg River Protection	25000 GW Protection	100 GW Protection
3-PART TEST					
Maximum > Cleanup Limit?	NO	NO	NO	NA	NO
> 10% above Cleanup Limit?	NO	NO	NO	NA	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NA	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG	The data set meets the 3-part test criteria when compared to the most stringent RAG	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (100 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0184
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 17 of 47

116-H-5 Statistical Calculations

Verification Data -Overburden

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Q	MDA	Plutonium-238 pCi/g	Q	MDA	Tritium pCi/g	Q	MDA	Uranium-233/234 pCi/g	Q	MDA	Uranium-238 pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.663	U	0.868	0	U	0.269	1.61	U	2.42	0.517		0.172	0.427		0.172
Duplicate of J19YF8	J19YH6	5/13/10	0.910	U	0.933	0.030	U	0.230	1.88	U	2.80	0.579		0.201	0.526		0.201
OB-1	J19YF4	5/13/10	0.576	U	0.874	0.024	U	0.227	0.746	U	2.51	0.541		0.136	0.559		0.136
OB-2	J19YF5	5/13/10	0.872	U	0.968	0.267		0.227	2.93		2.68	0.494		0.169	0.459		0.136
OB-3	J19YF6	5/13/10	0.145	U	0.982	0	U	0.267	3.04		2.74	0.401		0.161	0.527		0.161
OB-4	J19YF7	5/13/10	1.54		0.920	0	U	0.332	3.61		2.67	0.598		0.148	0.444		0.148
OB-6	J19YF9	5/13/10	1.24		0.890	0	U	0.322	0.975	U	2.50	0.620		0.250	0.588		0.250
OB-7	J19YH0	5/13/10	1.24		0.917	0.0230	U	0.224	2.78		2.59	0.558		0.194	0.660		0.194
OB-8 re-sample 1*	J1FKL6	3/17/11	0	U	0.451	0.0395	U	0.148	0.00188	U	0.0264	0.138	U	0.177	0.186	U	0.191
OB-9	J19YH2	5/13/10	1.49		0.862	1.46		0.298	2.22	U	2.44	0.482		0.194	0.508		0.194
OB-10	J19YH3	5/13/10	1.02		0.904	0	U	0.180	2.61		2.56	0.632		0.186	0.292		0.186
OB-11	J19YH4	5/13/10	0.261	U	0.862	0	U	0.170	0.916	U	2.47	0.464		0.209	0.626		0.209
OB-12	J19YH5	5/13/10	0.430	U	0.943	0	U	0.185	0.680	U	2.62	0.760		0.224	0.731		0.224
OB-13	J1B4H9	5/17/10	0.051	U	0.513	0.037	U	0.282	0	U	7.04	0.495		0.223	0.524		0.223
OB-14	J1B4J0	5/17/10	0.063	U	0.511	0	U	0.262	0	U	7.68	0.778		0.161	0.421		0.161
OB-15	J1B4J1	5/17/10	0	U	0.526	0	U	0.242	0	U	7.28	0	U	0.046	0.013	U	0.032

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Plutonium-238 pCi/g	Tritium pCi/g	Uranium-233/234 pCi/g	Uranium-238 pCi/g
OB-5	J19YF8/ J19YH6	5/13/10	0.787	0.015	1.75	0.548	0.477
OB-1	J19YF4	5/13/10	0.576	0.024	0.746	0.541	0.559
OB-2	J19YF5	5/13/10	0.872	0.267	0	0.494	0.459
OB-3	J19YF6	5/13/10	0.145	0	3.04	0.401	0.527
OB-4	J19YF7	5/13/10	1.54	0	3.61	0.598	0.444
OB-6	J19YF9	5/13/10	1.24	0	0.975	0.620	0.588
OB-7	J19YH0	5/13/10	1.24	0.023	2.78	0.558	0.660
OB-8 re-sample 1*	J1FKL6	3/17/11	0	0.040	0.00188	0.138	0.186
OB-9	J19YH2	5/13/10	1.49	1.46	2.22	0.482	0.508
OB-10	J19YH3	5/13/10	1.02	0	2.61	0.632	0.292
OB-11	J19YH4	5/13/10	0.261	0	0.92	0.464	0.628
OB-12	J19YH5	5/13/10	0.430	0	0.680	0.760	0.731
OB-13	J1B4H9	5/17/10	0.0510	0.037	0	0.495	0.524
OB-14	J1B4J0	5/17/10	0.0630	0	0	0.778	0.421
OB-15	J1B4J1	5/17/10	0	0	0	0	0.0130

Statistical Computations

	Carbon-14	Plutonium-238	Tritium	Uranium-233/234	Uranium-238
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
N	15	15	15	15	15
% < Detection limit	67%	87%	67%	13%	13%
Mean	0.628	0.106	0.0290	1.07	0.468
Standard deviation	0.561	0.376	1.27	0.205	0.186
Z-statistic	1.64	1.64	1.64	1.64	1.64
95% UCL on mean	0.866	0.268	0.570	1.16	0.547
Maximum value	1.54	0.267	3.81	0.778	0.731

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0184
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 18 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Overburden**

3	Sample	Sample	Sample	Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium			Chromium			Cobalt		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	0.344	B	0.813	4.96		0.813	51.4		0.407	0.162	B	0.163	0.938	B	1.63	0.203	U	0.203	10.4		0.813	5.41		2.44
6	Duplicate of J19YF8	J19YH6	5/13/10	0.388	B	0.951	4.74		0.951	47.2		0.478	0.149	B	0.190	0.842	B	1.90	0.238	U	0.238	10.1		0.951	5.16		2.85
7	OB-1	J19YF4	5/13/10	0.377	B	0.722	3.27		0.722	50.9		0.361	0.153		0.144	0.853	B	1.44	0.180	U	0.180	13.2		0.722	5.37		2.17
8	OB-2	J19YF5	5/13/10	0.437	B	0.912	4.17		0.912	51.8		0.456	0.161	B	0.182	0.958	B	1.82	0.054	B	0.228	11.4		0.912	5.34		2.74
9	OB-3	J19YF6	5/13/10	0.464	B	0.854	6.21		0.854	47.8		0.427	0.169	B	0.171	0.916	B	1.71	0.213	U	0.213	10.7		0.854	5.52		2.56
10	OB-4	J19YF7	5/13/10	0.272	B	0.840	3.96		0.840	48.5		0.420	0.162	B	0.168	0.902	B	1.68	0.210	U	0.210	11.7		0.840	5.15		2.52
11	OB-6	J19YF9	5/13/10	0.426	B	0.869	8.14		0.869	54.4		0.434	0.197		0.174	1.17	B	1.74	0.070	B	0.217	11.7		0.869	5.80		2.61
12	OB-7	J19YH0	5/13/10	0.279	B	0.855	5.13		0.855	43.1		0.427	0.149	B	0.171	0.805	B	1.71	0.084	B	0.214	9.84		0.855	4.93		2.58
13	OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.370	U	0.370	6.50		0.630	49.8	X	0.073	0.120	B	0.032	1.30	B	0.94	0.064	B	0.039	10.6	X	0.058	6.10	X	0.096
14	OB-9	J19YH2	5/13/10	0.773	U	0.773	3.59		0.773	48.7		0.386	0.136	B	0.155	0.752	B	1.55	0.193	U	0.193	9.58		0.773	4.95		2.32
15	OB-10	J19YH3	5/13/10	0.309	B	0.933	4.77		0.933	37.8		0.466	0.140	B	0.187	0.843	B	1.87	0.233	U	0.233	9.93		0.933	5.27		2.80
16	OB-11	J19YH4	5/13/10	0.491	B	0.854	6.82		0.854	67.6		0.427	0.208		0.171	1.34	B	1.71	0.064	B	0.214	12.8		0.854	5.88		2.56
17	OB-12	J19YH5	5/13/10	0.469	B	0.776	5.29		0.776	46.4		0.388	0.175		0.155	1.15	B	1.56	0.039	B	0.194	11.7		0.776	5.39		2.33
18	OB-13	J1B4H9	5/17/10	0.254	B	0.652	4.23		0.652	57.1		0.326	0.181		0.130	2.55		1.30	0.068	B	0.163	10.3		0.652	5.36		1.96
19	OB-14	J1B4J0	5/17/10	0.772	U	0.772	4.75		0.772	46.2		0.386	0.147	B	0.154	1.70		1.54	0.042	B	0.193	11.0		0.772	4.92		2.32
20	OB-15	J1B4J1	5/17/10	0.274	B	0.881	6.10		0.881	57.4		0.441	0.181		0.176	2.02		1.76	0.057	B	0.220	11.1		0.881	5.90		2.84

22 **Statistical Computation Input Data**

23	Sample	Sample	Sample	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt
24	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
25	OB-5	J19YF8/ J19YH6	5/13/10	0.366	4.85	49.3	0.156	0.890	0.110	10.3	5.29
26	OB-1	J19YF4	5/13/10	0.377	3.27	50.9	0.153	0.853	0.090	13.2	5.37
27	OB-2	J19YF5	5/13/10	0.437	4.17	51.8	0.161	0.958	0.054	11.4	5.34
28	OB-3	J19YF6	5/13/10	0.464	6.21	47.8	0.169	0.916	0.107	10.7	5.52
29	OB-4	J19YF7	5/13/10	0.272	3.96	48.5	0.162	0.902	0.105	11.7	5.15
30	OB-6	J19YF9	5/13/10	0.426	8.14	54.4	0.197	1.17	0.070	11.7	5.80
31	OB-7	J19YH0	5/13/10	0.279	5.13	43.1	0.149	0.805	0.084	9.84	4.93
32	OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.185	6.50	49.8	0.120	1.30	0.064	10.6	6.10
33	OB-9	J19YH2	5/13/10	0.387	3.59	48.7	0.136	0.752	0.097	9.58	4.95
34	OB-10	J19YH3	5/13/10	0.309	4.77	37.8	0.140	0.843	0.117	9.93	5.27
35	OB-11	J19YH4	5/13/10	0.491	6.82	67.6	0.208	1.34	0.064	12.8	5.88
36	OB-12	J19YH5	5/13/10	0.469	5.29	46.4	0.175	1.15	0.039	11.7	5.39
37	OB-13	J1B4H9	5/17/10	0.254	4.23	57.1	0.181	2.55	0.068	10.3	5.36
38	OB-14	J1B4J0	5/17/10	0.386	4.75	46.2	0.147	1.70	0.042	11.0	4.92
39	OB-15	J1B4J1	5/17/10	0.274	6.10	57.4	0.181	2.02	0.057	11.1	5.90

40 **Statistical Computations**

41		Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt
42	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
43	N	15	15	15	15	15	15	15	15
44	% < Detection limit	20%	0%	0%	0%	0%	40%	0%	0%
45	Mean	0.358	5.19	50.5	0.162	1.21	0.078	11.1	5.41
46	Standard deviation	0.092	1.34	6.9	0.023	0.51	0.025	1.05	0.37
47	95% UCL on mean	0.414	5.69	53.8	0.174	1.43	0.094	11.5	5.58
48	Maximum value	0.491	8.14	67.6	0.208	2.55	0.070	13.2	5.90
49	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	5 GW & River Protection	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	18.7 GW Protection
50	WAC 173-340 3-PART TEST								
51	95% UCL > Cleanup Limit?	NA	NO	NA	NA	NO	NA	NA	NA
52	> 10% above Cleanup Limit?	NA	NO	NA	NA	NO	NA	NA	NA
53	Any sample > 2X Cleanup Limit?	NA	NO	NA	NA	NO	NA	NA	NA
54	WAC 173-340 Compliance?	Because all values are below background (5 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.

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CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 19 of 47

1 **116-H-5 Statistical Calculations**
2 **Verification Data -Overburden**

	Sample	Sample	Sample	Copper			Hexavalent chromium			Lead			Manganese			Molybdenum			Nickel			Vanadium			Zinc		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	12.7		1.63	0.20	U	0.20	13.1		0.813	250		0.813	0.200	B	0.813	11.1		2.03	42.5		0.813	32.2		2.44
6	Duplicate of J19YF8	J19YH8	5/13/10	12.7		1.90	0.16	B	0.20	13.0		0.951	239		0.951	0.951	U	0.951	10.6		2.38	39.5		0.951	31.2		2.85
7	OB-1	J19YF4	5/13/10	13.5		1.44	0.15	B	0.20	6.95		0.722	266		0.722	0.250	B	0.722	10.9		1.80	41.7		0.722	32.8		2.17
8	OB-2	J19YF5	5/13/10	14.3		1.82	0.11	B	0.20	10.3		0.912	259		0.912	0.352	B	0.912	11.0		2.28	46.4		0.912	41.2		2.74
9	OB-3	J19YF6	5/13/10	13.5		1.71	0.18	B	0.20	17.6		0.854	251		0.854	0.232	B	0.854	10.1		2.13	45.3		0.854	33.3		2.56
10	OB-4	J19YF7	5/13/10	13.8		1.68	0.15	B	0.20	7.44		0.840	256		0.840	0.276	B	0.840	10.5		2.10	43.6		0.840	33.2		2.52
11	OB-6	J19YF9	5/13/10	13.2		1.74	0.14	B	0.20	25.2		0.869	272		0.869	0.313	B	0.869	9.82		2.17	46.5		0.869	39.0		2.61
12	OB-7	J19YH0	5/13/10	13.4		1.71	0.20	B	0.20	16.8		0.855	220		0.855	0.227	B	0.855	9.49		2.14	38.8		0.855	55.3		2.56
13	OB-8 re-sample 1[a]	J1FKL6	3/17/11	13.6		0.21	0.184		0.154	17.9	X	0.26	253	X	0.096	0.250	U	0.250	10.3	X	0.12	42.1		0.090	34.3	X	0.38
14	OB-9	J19YH2	5/13/10	11.7		1.55	0.12	B	0.20	8.91		0.773	224		0.773	0.167	B	0.773	8.89		1.93	41.5		0.773	30.1		2.32
15	OB-10	J19YH3	5/13/10	12.4		1.87	0.17	B	0.20	11.3		0.933	244		0.933	0.933	U	0.933	9.11		2.33	39.4		0.933	29.4		2.80
16	OB-11	J19YH4	5/13/10	14.5		1.71	0.15	B	0.20	22.4		0.854	276		0.854	0.199	B	0.854	11.6		2.14	45.5		0.854	44.4		2.56
17	OB-12	J19YH5	5/13/10	13.4		1.56	0.11	B	0.20	14.0		0.776	248		0.776	0.209	B	0.776	11.9		1.94	44.8		0.776	33.1		2.33
18	OB-13	J1B4H9	5/17/10	12.9		1.30	0.20	U	0.20	10.6		0.652	250		0.652	0.272	B	0.652	9.50		1.63	45.1		0.652	59.6		1.96
19	OB-14	J1B4J0	5/17/10	12.2		1.54	0.20	U	0.20	12.3		0.772	227		0.772	0.308	B	0.772	9.29		1.93	42.1		0.772	37.0		2.32
20	OB-15	J1B4J1	5/17/10	13.6		1.76	0.20	U	0.20	14.3		0.881	262		0.881	0.289	B	0.881	11.8		2.2	44.9		0.881	49.4		2.64

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22 **Statistical Computation Input Data**

23	Sample	Sample	Sample	Copper	Hexavalent chromium	Lead	Manganese	Molybdenum	Nickel	Vanadium	Zinc
24	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
25	OB-5	J19YF8/ J19YH8	5/13/10	12.7	0.13	13.1	245	0.338	10.9	41.0	31.7
26	OB-1	J19YF4	5/13/10	13.5	0.15	7.0	266	0.250	10.9	41.7	32.8
27	OB-2	J19YF5	5/13/10	14.3	0.11	10.3	259	0.352	11.0	46.4	41.2
28	OB-3	J19YF6	5/13/10	13.5	0.18	17.6	251	0.232	10.1	45.3	33.3
29	OB-4	J19YF7	5/13/10	13.8	0.15	7.44	256	0.276	10.5	43.6	33.2
30	OB-6	J19YF9	5/13/10	13.2	0.14	25.2	272	0.313	9.82	46.5	39.0
31	OB-7	J19YH0	5/13/10	13.4	0.20	16.8	220	0.227	9.49	38.8	55.3
32	OB-8 re-sample 1[a]	J1FKL6	3/17/11	13.6	0.18	17.9	253	0.125	10.3	42.1	34.3
33	OB-9	J19YH2	5/13/10	11.7	0.12	8.91	224	0.167	8.89	41.5	30.1
34	OB-10	J19YH3	5/13/10	12.4	0.17	11.3	244	0.467	9.11	39.4	29.4
35	OB-11	J19YH4	5/13/10	14.5	0.15	22.4	276	0.199	11.6	45.5	44.4
36	OB-12	J19YH5	5/13/10	13.4	0.11	14.0	248	0.209	11.9	44.8	33.1
37	OB-13	J1B4H9	5/17/10	12.9	0.10	10.5	250	0.272	9.50	45.1	59.6
38	OB-14	J1B4J0	5/17/10	12.2	0.10	12.3	227	0.308	9.29	42.1	37.0
39	OB-15	J1B4J1	5/17/10	13.6	0.10	14.3	262	0.289	11.8	44.9	49.4

40 **Statistical Computations**

41		Copper	Hexavalent chromium	Lead	Manganese	Molybdenum	Nickel	Vanadium	Zinc
42	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
43	N	15	15	15	15	15	15	15	15
44	% < Detection limit	0%	20%	0%	0%	13%	0%	0%	0%
45	Mean	13.2	0.14	13.9	250	0.266	10.3	43.2	38.9
46	Standard deviation	0.8	0.033	5.3	16.8	0.084	0.99	2.48	9.34
47	95% UCL on mean	13.6	0.16	17.0	255	0.318	10.8	44.4	43.4
48	Maximum value	14.5	0.20	25.2	276	0.313	11.9	46.5	59.6
49	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	22.0 River Protection	2 River Protection	10.2 GW & River Protection	512 GW & River Protection	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection
50	**WAC 173-340 3-PART TEST**								
51	95% UCL > Cleanup Limit?	NA	NO	YES	NA	NO	NA	NA	NA
52	> 10% above Cleanup Limit?	NA	NO	YES	NA	NO	NA	NA	NA
53	Any sample > 2X Cleanup Limit?	NA	NO	YES	NA	NO	NA	NA	NA
54	**WAC 173-340 Compliance?**	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.

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CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 20 of 47

1 116-H-5 Statistical Calculations
2 Verification Data -Overburden

	Sample Area	Sample Number	Sample Date	Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
4				ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	5.88		3.25	7.38		3.25	8.77		3.25	4.89		3.25
6	Duplicate of J19YF8	J19YH6	5/13/10	4.07		3.26	4.25		, 3.25	7.52		3.26	3.03	J	3.25
7	OB-1	J19YF4	5/13/10	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	3.35	U	3.36
8	OB-2	J19YF5	5/13/10	3.26	U	3.26	1.24	J	3.26	3.26	U	3.26	3.26	U	3.26
9	OB-3	J19YF6	5/13/10	0.974	J	3.35	1.7	J	3.35	1.44	J	3.35	1.56	J	3.36
10	OB-4	J19YF7	5/13/10	0.919	J	3.28	1.44	J	3.28	1.07	J	3.28	0.837	J	3.28
11	OB-6	J19YF9	5/13/10	4.65		3.24	7.63		3.24	9.71		3.24	9.53		3.24
12	OB-7	J19YH0	5/13/10	55.5		3.34	68.8		3.34	71.0		3.34	36.8		3.34
13	OB-8 re-sample 1'	J1FKL6	3/17/11	18		3.3	17		6.6	18		4.3	7.4	U	7.4
14	OB-9	J19YH2	5/13/10	94.5		3.25	85.3		3.25	84.1		3.25	64.5		3.25
15	OB-10	J19YH3	5/13/10	13.3		3.32	11.9		3.32	11.7		3.32	9.20		3.32
16	OB-11	J19YH4	5/13/10	21.3		3.18	57.4		3.18	53.5		3.18	98.0		3.18
17	OB-12	J19YH5	5/13/10	13.7		3.36	12.8		3.36	17		3.36	9.28		3.36
18	OB-13	J1B4H9	5/17/10	10.2		3.33	7.41		3.33	15.4		3.33	4.4		3.33
19	OB-14	J1B4J0	5/17/10	6.98		3.33	5.72		3.33	8.78		3.33	4.07		3.33
20	OB-15	J1B4J1	5/17/10	22.3		3.34	18.9		3.34	27.5		3.34	11.6		3.34

	Sample Area	Sample Number	Sample Date	Benzo(k)fluoranthene			Chrysene			Dibenz[a,h]anthracene			Fluoranthene		
4				ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	3.72		3.25	3.77		3.25	0.894	J	3.25	21		3.25
6	Duplicate of J19YF8	J19YH6	5/13/10	2.31	J	3.25	1.17	J	3.25	3.25	U	3.25	9.18		3.25
7	OB-1	J19YF4	5/13/10	3.35	U	3.35	3.35	U	3.36	3.35	U	3.35	3.98		3.35
8	OB-2	J19YF5	5/13/10	3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	1.39	J	3.26
9	OB-3	J19YF6	5/13/10	3.35	U	3.35	3.35	U	3.36	3.36	U	3.35	6.45		3.36
10	OB-4	J19YF7	5/13/10	3.28	U	3.28	1.46	J	3.28	3.28	U	3.28	6.55		3.28
11	OB-6	J19YF9	5/13/10	3.92		3.24	5.51		3.24	1.43	J	3.24	15.3		3.24
12	OB-7	J19YH0	5/13/10	30.4		3.34	39.9		3.34	8.73		3.34	161		3.34
13	OB-8 re-sample 1'	J1FKL6	3/17/11	9.20	J	4.1	16.0	J	5.0	11	U	11	13.0	U	13.0
14	OB-9	J19YH2	5/13/10	43.5		3.25	160		3.25	19.0		3.25	269		3.25
15	OB-10	J19YH3	5/13/10	6.06		3.32	34.1		3.32	2.49	J	3.32	29.1		3.32
16	OB-11	J19YH4	5/13/10	22.1		3.18	17.3		3.18	10.8		3.18	54.6		3.18
17	OB-12	J19YH5	5/13/10	6.11		3.36	23.7		3.36	1.6	J	3.36	29.5		3.36
18	OB-13	J1B4H9	5/17/10	3.40		3.33	16.7		3.33	3.33	U	3.33	24.6		3.33
19	OB-14	J1B4J0	5/17/10	2.53	J	3.33	8.23		3.33	3.33	U	3.33	17.9		3.33
20	OB-15	J1B4J1	5/17/10	7.86		3.34	32.5		3.34	1.49	J	3.34	65.9		3.34

21
22 Statistical Computation Input Data

	Sample Area	Sample Number	Sample Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene
24				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
25	OB-5	J19YF8/ J19YH6	5/13/10	5.0	5.82	8.15	3.96	3.02	2.47	1.28	15.1
26	OB-1	J19YF4	5/13/10	1.7	1.68	1.68	1.68	1.68	1.68	1.7	3.98
27	OB-2	J19YF5	5/13/10	1.6	1.24	1.63	1.63	1.63	1.63	1.6	1.39
28	OB-3	J19YF6	5/13/10	1.0	1.70	1.44	1.56	1.68	1.68	1.7	6.46
29	OB-4	J19YF7	5/13/10	0.9	1.44	1.07	0.84	1.64	1.46	1.6	6.55
30	OB-6	J19YF9	5/13/10	4.7	7.63	9.71	9.53	3.92	5.51	1.4	15.3
31	OB-7	J19YH0	5/13/10	55.5	68.8	71.0	36.8	30.4	39.9	8.7	161
32	OB-8 re-sample 1'	J1FKL6	3/17/11	18.0	17.0	18.0	3.70	9.20	16.0	5.5	6.50
33	OB-9	J19YH2	5/13/10	94.5	85.3	84.1	64.5	43.5	160.0	19.0	269
34	OB-10	J19YH3	5/13/10	13.3	11.9	11.7	9.20	6.06	34.1	2.5	29.1
35	OB-11	J19YH4	5/13/10	21.3	57.4	53.5	98.0	22.1	17.3	10.8	54.6
36	OB-12	J19YH5	5/13/10	13.7	12.8	17.0	9.28	6.11	23.7	1.6	29.5
37	OB-13	J1B4H9	5/17/10	10.2	7.41	15.4	4.40	3.40	18.7	1.7	24.6
38	OB-14	J1B4J0	5/17/10	7.0	5.72	8.78	4.07	2.53	8.23	1.7	17.9
39	OB-15	J1B4J1	5/17/10	22.3	18.9	27.5	11.6	7.86	32.5	1.5	65.9

40 Statistical Computations

41		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene
42	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10). lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
43	N	15	15	15	15	15	15	15	15
44	% < Detection limit	13%	7%	13%	20%	27%	20%	47%	7%
45	Mean	18.0	20.3	22.0	17.4	9.6	24.3	4.15	47.1
46	Standard deviation	25.3	27.1	26.3	28.1	12.5	39.7	5.05	73.6
47	95% UCL on mean	78.5	83.1	105	52.9	21.9	113	6.29	188
48	Maximum value	94.5	85.3	84.1	98.0	43.5	160	19.0	269
49	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	48000 ug/kg GW & River Protection	15 ug/kg GW & River Protection	100 ug/kg GW & River Protection	30 ug/kg GW & River Protection	18000 ug/kg River Protection
50	WAC 173-340 3-PART TEST								
51	95% UCL > Cleanup Limit?	YES	YES	YES	NO	YES	YES	NO	NO
52	> 10% above Cleanup Limit?	YES	YES	YES	NO	YES	NO	NO	NO
53	Any sample > 2X Cleanup Limit?	YES	YES	YES	NO	YES	NO	NO	NO
54	WAC 173-340 Compliance?	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 21 of 47

116-H-5 Statistical Calculations

Verification Data -Overburden

Sample Area	Sample Number	Sample Date	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL	Fluoride mg/kg	Q	PQL	Nitrogen in nitrate [b] mg/kg	Q	PQL	Nitrogen in nitrate and nitrite mg/kg	Q	PQL	Sulfate mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	5.72		3.25	6.78		3.25	17.2		3.25	0.8	B	2.5	0.70		0.56	0.66		0.20	5.6		2.5
Duplicate of J19YF8	J19YH6	5/13/10	4.02		3.25	3.08	J	3.25	7.13		3.25	0.5	B	2.5	0.81		0.56	0.75		0.20	6.2		2.5
OB-1	J19YF4	5/13/10	0.839	J	3.35	1.31	J	3.35	1.44	J	3.35	0.7	B	2.5	0.56	U	0.56	0.56		0.20	2.9		2.5
OB-2	J19YF5	5/13/10	1.08	J	3.26	1.19	J	3.26	1.27	J	3.26	0.7	B	2.3	0.52	U	0.52	0.34		0.19	6.4		2.3
OB-3	J19YF6	5/13/10	1.56	J	3.35	1.38	J	3.35	3.14	J	3.35	0.7	B	2.4	1.29		0.54	1.41		0.19	6.6		2.4
OB-4	J19YF7	5/13/10	1.18	J	3.28	1.61	J	3.28	2.38	J	3.28	0.6	B	2.2	0.52		0.50	0.55		0.20	4.3		2.2
OB-6	J19YF9	5/13/10	7.89		3.24	4.49		3.24	9.13		3.24	0.8	B	2.3	1.60		0.52	1.25		0.21	14.2		2.3
OB-7	J19YH0	5/13/10	42.4		3.34	86.9		3.34	176		3.34	0.8	B	2.5	0.56	U	0.56	1.30		0.18	8.8		2.5
OB-8 re-sample 1[a]	J1FKL6	3/17/11	14.0	J	12.0	15.0	J	12.0	34.0	J	12.0	1.1	B	0.88	0.96	B	0.33	0.79	B	0.36	6.9		1.8
OB-9	J19YH2	5/13/10	71.3		3.25	201		3.25	290		3.25	0.7	B	2.4	0.52	B	0.54	0.66		0.19	3.0		2.4
OB-10	J19YH3	5/13/10	12.8		3.32	11.3		3.32	39.6		3.32	0.6	B	2.4	2.51		0.54	2.49		0.19	7.7		2.4
OB-11	J19YH4	5/13/10	68.8		3.18	14.1		3.18	51.9		3.18	1.0	B	2.5	0.90		0.56	0.99		0.18	7.4		2.5
OB-12	J19YH5	5/13/10	9.37		3.36	10.4		3.36	28.7		3.36	0.7	B	2.4	0.86		0.54	0.95		0.22	3.8		2.4
OB-13	J1B4H9	5/17/10	8.95		3.33	7.35		3.33	18.3		3.33	0.5	B	2.3	5.08		0.52	4.61		0.20	6.4		2.3
OB-14	J1B4J0	5/17/10	5.05		3.33	6.48		3.33	13.8		3.33	0.7	B	2.3	3.10		0.52	3.01		0.20	5.4		2.3
OB-15	J1B4J1	5/17/10	16.5		3.34	26.8		3.34	49.6		3.34	0.3	B	2.2	3.23		0.50	2.85		0.19	8.0		2.2

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg	Fluoride mg/kg	Nitrogen in nitrate [b] mg/kg	Nitrogen in nitrate and nitrite mg/kg	Sulfate mg/kg
OB-5	J19YF8/ J19YH6	5/13/10	4.87	4.93	12.2	0.7	0.76	0.71	5.9
OB-1	J19YF4	5/13/10	0.84	1.31	1.4	0.7	0.28	0.56	2.9
OB-2	J19YF5	5/13/10	1.08	1.19	1.3	0.7	0.26	0.34	6.4
OB-3	J19YF6	5/13/10	1.56	1.38	3.1	0.7	1.29	1.41	6.6
OB-4	J19YF7	5/13/10	1.18	1.61	2.4	0.6	0.52	0.55	4.3
OB-6	J19YF9	5/13/10	7.89	4.49	9.1	0.8	1.60	1.25	14.2
OB-7	J19YH0	5/13/10	42.4	86.9	176	0.8	0.28	1.30	8.8
OB-8 re-sample 1[a]	J1FKL6	3/17/11	14.0	15.0	34.0	1.1	0.96	0.79	6.9
OB-9	J19YH2	5/13/10	71.3	201	290	0.7	0.52	0.66	3.0
OB-10	J19YH3	5/13/10	12.8	11.3	39.6	0.6	2.51	2.49	7.7
OB-11	J19YH4	5/13/10	68.8	14.1	51.9	1.0	0.90	0.99	7.4
OB-12	J19YH5	5/13/10	9.37	10.4	28.7	0.7	0.86	0.95	3.8
OB-13	J1B4H9	5/17/10	8.95	7.35	18.3	0.5	5.08	4.61	6.4
OB-14	J1B4J0	5/17/10	5.05	6.48	13.8	0.7	3.10	3.01	5.4
OB-15	J1B4J1	5/17/10	16.5	26.8	49.6	0.3	3.23	2.85	8.0

Statistical Computations

	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoride	Nitrogen in nitrate [b]	Nitrogen in nitrate and nitrite	Sulfate
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	15	15	15	15	15	15	15
% < Detection limit	0%	0%	0%	0%	20%	0%	0%
Mean	17.8	26.3	48.8	0.7	1.5	1.5	6.5
Standard deviation	23.6	52.9	79.7	0.2	1.4	1.2	2.8
95% UCL on mean	83.4	107	342	0.8	3.0	2.4	8.2
Maximum value	71.3	201	290	1.1	5.1	4.6	14.2
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	330 ug/kg GW & River Protection	240000 ug/kg GW Protection	48000 ug/kg GW Protection	96 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NO	NO	NO	NA	NA	NA	NA
> 10% above Cleanup Limit?	NO	NO	NO	NA	NA	NA	NA
Any sample > 2X Cleanup Limit?	NO	NO	NO	NA	NA	NA	NA
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 22 of 47

1 **116-H-5 Maximum Calculations**
2 **Verification Data -Overburden**

	Sample Area	Sample Number	Sample Date	Silver			Bis(2-ethylhexyl)phthalate			Naphthalene			Acenaphthene		
4				mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	0.813	U	0.813	331	U	331	3.25	U	3.25	3.25	U	3.25
6	Duplicate of J19YF8	J19YH5	5/13/10	0.951	U	0.951	330	U	330	3.25	U	3.25	3.25	U	3.25
7	OB-1	J19YF4	5/13/10	0.722	U	0.722	333	U	333	3.35	U	3.35	3.36	U	3.35
8	OB-2	J19YF5	5/13/10	0.912	U	0.912	324	U	324	3.26	U	3.26	3.26	U	3.26
9	OB-3	J19YF6	5/13/10	0.854	U	0.854	330	U	330	3.35	U	3.35	3.36	U	3.35
10	OB-4	J19YF7	5/13/10	0.840	U	0.840	331	U	331	3.28	U	3.28	3.28	U	3.28
11	OB-6	J19YF9	5/13/10	0.869	U	0.869	329	U	329	3.24	U	3.24	3.24	U	3.24
12	OB-7	J19YH0	5/13/10	0.855	U	0.855	323	U	323	3.34	U	3.34	3.34	U	3.34
13	OB-8 re-sample 1*	J1FKL6	3/17/11	0.150	U	0.150	120	JB	48	12.0	U	12.0	10.0	U	10.0
14	OB-9	J19YH2	5/13/10	0.773	U	0.773	331	U	331	3.25	U	3.25	21.9		3.25
15	OB-10	J19YH3	5/13/10	0.933	U	0.933	331	U	331	3.32	U	3.32	3.32	U	3.32
16	OB-11	J19YH4	5/13/10	0.854	U	0.854	333	U	333	3.18	U	3.18	7.10		3.16
17	OB-12	J19YH5	5/13/10	0.776	U	0.776	328	U	328	3.36	U	3.36	3.36	U	3.36
18	OB-13	J1B4H9	5/17/10	0.138	B	0.652	331	U	331	25.1		3.33	7.96		3.33
19	OB-14	J1B4J0	5/17/10	0.156	B	0.772	328	U	328	3.33	U	3.33	3.33	U	3.33
20	OB-15	J1B4J1	5/17/10	0.881	U	0.881	331	U	331	3.34	U	3.34	3.34	U	3.34

	Sample Number	Anthracene			Fluorene			4,4'-DDE			Chloride		
4		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL
5	J19YF8	1.88	J	3.25	3.25	U	3.25	1.33	UD	1.33	2.5	U	2.5
6	J19YH5	3.25	U	3.25	3.25	U	3.26	1.32	UD	1.32	2.5	U	2.5
7	J19YF4	3.35	U	3.35	3.35	U	3.35	1.34	UD	1.34	20.6		2.5
8	J19YF5	3.26	U	3.26	3.26	U	3.26	1.33	UD	1.33	2.3	U	2.3
9	J19YF6	3.36	U	3.35	3.36	U	3.36	1.32	UD	1.32	2.4	U	2.4
10	J19YF7	3.28	U	3.28	3.28	U	3.28	1.33	UD	1.33	3.6		2.2
11	J19YF9	3.24	U	3.24	3.24	U	3.24	1.34	UD	1.34	2.3	U	2.3
12	J19YH0	37.5		3.34	4.38		3.34	1.33	UD	1.33	6.9		2.5
13	J1FKL6	3.10	U	3.10	5.40	U	5.40	0.45	JX	0.25	2.8	B	2.1
14	J19YH2	58.4		3.25	32.3		3.26	1.34	UD	1.34	2.4	U	2.4
15	J19YH3	1.88	J	3.32	1.36	J	3.32	1.32	UD	1.32	2.4	U	2.4
16	J19YH4	2.43	J	3.18	1.11	J	3.18	1.32	UD	1.32	2.5	U	2.5
17	J19YH5	1.41	J	3.36	3.36	U	3.36	1.34	UD	1.34	2.4	U	2.4
18	J1B4H9	3.33	U	3.33	3.33	U	3.33	1.33	UD	1.33	2.3	U	2.3
19	J1B4J0	3.33	U	3.33	3.33	U	3.33	1.33	UD	1.33	2.3	U	2.3
20	J1B4J1	2.59	J	3.34	1.71	J	3.34	1.34	UD	1.34	2.2	U	2.2

	Sample Number	TPH-diesel range			TPH-diesel range EXT			TPH-motor oil (high boiling)		
4		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	J19YF8	3360	U	3360				10100	U	10100
6	J19YH5	3350	U	3350				10000	U	10000
7	J19YF4	3350	U	3350				10100	U	10100
8	J19YF5	3330	U	3330				9980	U	9980
9	J19YF6	3340	U	3340				10000	U	10000
10	J19YF7	3360	U	3360				10100	U	10100
11	J19YF9	3330	U	3330				5970	J	10000
12	J19YH0	3300	U	3300				9900	U	9900
13	J1FKL6	3200	J	720	6500		1100	8510	J	10100
14	J19YH2	3340	U	3340				10000	U	10000
15	J19YH3	3340	U	3340				10000	U	10000
16	J19YH4	3340	U	3340				15000		10000
17	J19YH5	3340	U	3340				10000	U	10000
18	J1B4H9	3360	U	3360				11500		10100
19	J1B4J0	3310	U	3310				6810	J	9930
20	J1B4J1	3340	U	3340				8950	J	10000

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22 **Statistical Computations**

		Silver	Bis(2-ethylhexyl)phthalate	Naphthalene	Acenaphthene	Anthracene	Fluorene	4,4'-DDE	Chloride	TPH-diesel range	TPH-diesel range EXT	TPH-motor oil (high boiling)
24	% < Detection limit	87%	93%	93%	80%	53%	67%	93%	73%	93%	0%	60%
25	Maximum value	0.156	120	25.1	21.9	58.4	32.3	0.45	20.6	3200	6500	15000
26	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	0.73 River Protection	360 ug/kg River Protection	16000 ug/kg GW Protection	96000 ug/kg GW Protection	240000 ug/kg GW Protection	64000 ug/kg GW Protection	3.3 ug/kg River Protection	25000 GW Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection
27	**3-PART TEST**											
28	Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO
29	> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO
30	Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO
31	**3-Part Test Compliance?**	Because all values are below background (0.73 mg/kg) the 3-part test is not required	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (100 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 23 of 47

1 **116-H-5 Statistical Calculations**
2 **Verification Data -Staging Pile Area**

	Sample Area	Sample Number	Sample Date	Cesium-137			Technetium-99			Uranium-233/234			Uranium-238		
3–4				pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0	U	0.0804	0.165	U	0.607	0.127		0.120	0.0772	U	0.101
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0328	U	0.0608	0.177	U	0.826	0.0680	U	0.139	0.238		0.163
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.0180	U	0.0258	0.403	U	0.625	0.218		0.142	0.174		0.135
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0	U	0.0341	0.288	U	0.624	0.043	U	0.105	0.115		0.0873
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0	U	0.0262	0.520	U	0.817	0.162		0.0870	0.160		0.0970
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.0528	U	0.0969	0.397	U	0.621	0.138		0.130	0.0244	U	0.128
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0515	U	0.0571	0.256	U	0.618	0.141	U	0.154	0.132	U	0.180
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0679		0.0285	0.439	U	0.656	0.0757	U	0.147	0.130	U	0.153
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0	U	0.0279	0.485	U	0.615	0.207		0.119	0.183		0.0988
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0	U	0.0322	0.237	U	0.645	0.453		0.106	0.224		0.114
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0	U	0.0312	0.427	U	0.633	0.187		0.100	0.211		0.112
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0	U	0.0343	0.575	U	0.615	0.141		0.111	0.0711	U	0.0931
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.0167	U	0.0248	0.809		0.656	0.0717	U	0.178	0.189		0.173

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19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Cesium-137 pCi/g	Technetium-99 pCi/g	Uranium-233/234 pCi/g	Uranium-238 pCi/g
22	SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	0.0163	0.171	0.0925	0.157
23	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.0180	0.403	0	0
24	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0	0.288	0	0.115
25	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0	0.520	0.162	0.160
26	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.0528	0.397	0.138	0.0244
27	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0515	0.256	0	0.132
28	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0679	0.439	0.0757	0.130
29	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0	0.485	0.207	0
30	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0	0.237	0.453	0.224
31	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0	0.427	0.187	0.211
32	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0	0.575	0	0.0711
33	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.0167	0.809	0.0717	0.189

34 **Statistical Computations**

35		Cesium-137	Technetium-99	Uranium-233/234	Uranium-238
36	95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic	Radionuclide data set. Use nonparametric z-statistic.
37	N	12	12	12	12
38	% < Detection limit	92%	92%	33%	33%
39	Mean	0.0127	0.417	0.0290	1.07
40	Standard deviation	0.0248	0.173	0.112	0.0575
41	Z-statistic	1.64	1.64	1.64	1.64
42	95% UCL on mean	0.0246	0.499	0.0822	1.10
43	Maximum value	0.0679	0.809	0.453	0.236

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 06/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 06/17/11
Sheet No. 24 of 47

116-H-5 Statistical Calculations

Verification Data -Staging Pile Area

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	1.7		0.58	32.9	X	0.067	0.065	B	0.029	0.86	U	0.86	0.054	B	0.036
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	2.1		0.69	36.4	X	0.079	0.074	B	0.034	1.0	U	1.0	0.079	B	0.043
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	2.2		0.59	36.4	X	0.067	0.069	B	0.029	0.88	B	0.87	0.043	B	0.036
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	1.7		0.64	33.5	X	0.074	0.079	B	0.032	0.95	U	0.95	0.049	B	0.040
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	1.5		0.57	37.3	X	0.066	0.069	B	0.029	0.86	U	0.85	0.077	B	0.036
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	7.8		0.58	88.8	X	0.067	0.15	B	0.029	6.9		0.67	0.15	B	0.036
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.1		0.59	60.5	X	0.068	0.15	B	0.030	2.1		0.68	0.11	B	0.037
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	14.1		0.69	126	X	0.079	0.17	B	0.034	1.7	B	1.0	0.12	B	0.043
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	6.7		0.70	68.3	X	0.080	0.10	B	0.035	1.2	B	1.0	0.10	B	0.043
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	12.2		0.67	82.9	X	0.077	0.22		0.033	1.4	B	0.99	0.14	B	0.041
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	3.4		0.65	40.6	X	0.075	0.047	B	0.032	0.96	U	0.96	0.069	B	0.040
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	2.2		0.56	43.0	X	0.065	0.028	B	0.028	0.84	U	0.84	0.077	B	0.036
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	14.2		0.59	72.5	X	0.066	0.16	B	0.030	1.8		0.88	0.12	B	0.037

Sample Area	Sample Number	Sample Date	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	8.8	X	0.061	4.9	X	0.088	12.3		0.19	2.7	X	0.24	222	X	0.088
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	9.6	X	0.080	5.1	X	0.10	11.4		0.23	2.4	X	0.28	226	X	0.10
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	9.2	X	0.051	4.9	X	0.089	11.3		0.19	2.0	X	0.24	218	X	0.089
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	9.4	X	0.056	5.2	X	0.097	12.1		0.21	2.1	X	0.26	231	X	0.097
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	6.1	X	0.050	4.5	X	0.087	12.5		0.19	2.3	X	0.23	182	X	0.087
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	11.0	X	0.061	6.3	X	0.088	15.9		0.19	30.7	X	0.24	254	X	0.088
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.6	X	0.062	6.0	X	0.090	13.5		0.19	36.3	X	0.24	252	X	0.090
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	11.9	X	0.061	7.2	X	0.10	15.6		0.23	70.5	X	0.28	300	X	0.10
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	10.5	X	0.061	7.2	X	0.11	17.0		0.23	20.0	X	0.29	286	X	0.11
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	13.1	X	0.058	7.9	X	0.10	14.9		0.22	32.7	X	0.27	362	X	0.10
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	9.4	X	0.067	6.7	X	0.098	14.0		0.21	5.5	X	0.27	230	X	0.098
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	9.4	X	0.050	6.8	X	0.086	12.9		0.19	2.3	X	0.23	241	X	0.086
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	11.6	X	0.062	6.8	X	0.090	14.0		0.20	56.5	X	0.24	294	X	0.090

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	1.9	34.7	0.080	0.47	0.067	9.2	5.0	11.9	2.55	224
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	2.2	36.4	0.069	0.88	0.043	9.2	4.9	11.3	2.00	218
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	1.7	33.5	0.079	0.48	0.049	9.4	5.2	12.1	2.10	231
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	1.5	37.3	0.069	0.43	0.077	6.1	4.5	12.5	2.30	182
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	7.8	88.8	0.15	6.9	0.15	11.0	6.3	15.9	30.7	254
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.1	60.5	0.15	2.1	0.11	9.6	6.0	13.5	35.3	252
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	14.1	126	0.17	1.7	0.12	11.9	7.2	15.6	70.5	300
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	6.7	68.3	0.10	1.2	0.10	10.5	7.2	17.0	20.0	286
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	12.2	82.9	0.22	1.4	0.14	13.1	7.9	14.9	32.7	362
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	3.4	40.6	0.047	0.48	0.069	9.4	6.7	14.0	5.50	230
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	2.2	43.0	0.028	0.42	0.077	9.4	6.8	12.9	2.30	241
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	14.2	72.5	0.16	1.8	0.12	11.6	6.8	14.0	58.5	294

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12
% < Detection limit	0%	0%	0%	42%	0%
Mean	6.4	60.4	0.11	1.5	0.093
Standard deviation	5.0	28.6	0.057	1.8	0.036
95% UCL on mean	14.0	80.0	0.17	2.4	0.12
Maximum value	14.2	126	0.22	6.9	0.15
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection
WAC 173-340 3-PART TEST					
95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA
> 10% above Cleanup Limit?	NO	NA	NA	NO	NA
Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.

	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%
Mean	10.0	6.2	13.8	22.0	256
Standard deviation	1.8	1.1	1.78	23.9	46
95% UCL on mean	11.0	6.9	14.8	33.4	283
Maximum value	13.1	7.9	17.0	70.5	362
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
WAC 173-340 3-PART TEST					
95% UCL > Cleanup Limit?	NA	NA	NA	YES	NA
> 10% above Cleanup Limit?	NA	NA	NA	YES	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	YES	NA
WAC 173-340 Compliance?	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
Sheet No. 25 of 47

1 116-H-5 Statistical Calculations

2 Verification Data -Staging Pile Area

	Sample	Sample	Sample	Nickel			Vanadium			Zinc			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(k)fluoranthene			Chrysene			Indeno(1,2,3-cd)pyrene			Phenanthrene		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1ª	J1FKM0	3/17/11	8.3	X	0.11	35.8		0.083	28.4	X	0.35	230		3.1	170		6.2	190		4.1	87		3.8	160		4.7	120		12	240		12
6	Duplicate of J1FKM0ª	J1FKM9	3/17/11	10.3	X	0.13	38.0		0.098	28.1	X	0.41	170		3.1	120		6.2	140		4.0	69		3.8	140		4.6	110		12	130		12
7	SPA-1 re-sample 1ª	J1FKL7	3/17/11	9.4	X	0.11	36.8		0.083	26.4	X	0.35	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3	4.1	U	4.1	5.0	U	5.0	12	U	12	12	U	12
8	SPA-2 re-sample 1ª	J1FKL8	3/17/11	10.5	X	0.12	38.4		0.091	27.9	X	0.39	3.3	U	3.3	6.8	J	6.8	4.3	U	4.3	4.1	U	4.1	5.0	U	5.0	12	U	12	12	U	12
9	SPA-3 re-sample 1ª	J1FKL9	3/17/11	7.0	X	0.11	36.4		0.081	25.7	X	0.35	25	X	3.1	17		6.2	20		4.1	11	JX	3.8	27	J	4.7	12	J	12	13	J	12
10	SPA-5 re-sample 1ª	J1FKM1	3/17/11	10.8	X	0.11	41.1		0.083	40.6	X	0.35	19		3.1	22		6.2	25		4.1	9.8	J	3.8	21	J	4.7	16	J	12	12	U	12
11	SPA-6 re-sample 1ª	J1FKM2	3/17/11	9.5	X	0.11	36.1		0.084	36.4	X	0.36	21		3.3	27		6.6	20		4.3	10	J	4.1	24	J	5.0	21	J	12	19	J	12
12	SPA-7 re-sample 1ª	J1FKM3	3/17/11	11.2	X	0.13	46.4		0.098	44.8	X	0.42	22		3.2	37		6.5	20		4.2	8.9	J	4.0	26	J	4.9	17	J	12	17	J	12
13	SPA-8 re-sample 1ª	J1FKM4	3/17/11	9.7	X	0.13	59.2		0.099	44.6	X	0.42	31		3.3	25		6.6	21		4.3	9.7	J	4.0	29	J	5.0	20	J	12	32	J	12
14	SPA-9 re-sample 1ª	J1FKM5	3/17/11	12.8	X	0.12	45.4		0.095	48.6	X	0.40	8.9	J	3.5	9.6	J	6.9	4.5	U	4.5	4.3	U	4.3	8.7	J	5.2	13	U	13	13	U	13
15	SPA-10 re-sample 1ª	J1FKM6	3/17/11	10.2	X	0.12	49.8		0.092	32.8	X	0.39	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1	3.8	U	3.8	4.7	U	4.7	12	U	12	12	U	12
16	SPA-11 re-sample 1ª	J1FKM7	3/17/11	8.0	X	0.11	53.3		0.080	32.9	X	0.34	3.2	U	3.2	6.5	U	6.5	4.3	U	4.3	4.0	U	4.0	4.9	U	4.9	12	U	12	12	U	12
17	SPA-12 re-sample 1ª	J1FKM8	3/17/11	10.6	X	0.11	45.8		0.085	43.5	X	0.36	44		3.3	27		6.6	37		4.3	14	J	4.1	35	J	5.0	27	J	12	14	J	12

19 Statistical Computation Input Data

20	Sample	Sample	Sample	Nickel	Vanadium	Zinc	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Indeno(1,2,3-cd)pyrene	Phenanthrene
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	SPA-4 re-sample 1ª	J1FKM0/ J1FKM9	3/17/11	9.3	36.9	28.3	200	145	165	78	150	115	185
23	SPA-1 re-sample 1ª	J1FKL7	3/17/11	9.4	36.8	26.4	1.7	3.3	2.2	2.1	2.5	6.0	6.0
24	SPA-2 re-sample 1ª	J1FKL8	3/17/11	10.5	38.4	27.9	1.7	6.8	2.2	2.1	2.5	6.0	6.0
25	SPA-3 re-sample 1ª	J1FKL9	3/17/11	7.0	36.4	25.7	25	17	20	11	27	12	13
26	SPA-5 re-sample 1ª	J1FKM1	3/17/11	10.8	41.1	40.6	19	22	25	9.8	21	16	6.0
27	SPA-6 re-sample 1ª	J1FKM2	3/17/11	9.5	36.1	36.4	21	27	20	10	24	21	19
28	SPA-7 re-sample 1ª	J1FKM3	3/17/11	11.2	46.4	44.8	22	37	20	8.9	26	17	17
29	SPA-8 re-sample 1ª	J1FKM4	3/17/11	9.7	59.2	44.6	31	25	21	9.7	29	20	32
30	SPA-9 re-sample 1ª	J1FKM5	3/17/11	12.8	45.4	48.6	6.9	9.6	2.3	2.2	8.7	6.5	6.5
31	SPA-10 re-sample 1ª	J1FKM6	3/17/11	10.2	49.8	32.8	1.6	3.2	2.1	1.9	2.4	6.0	6.0
32	SPA-11 re-sample 1ª	J1FKM7	3/17/11	8.0	53.3	32.9	1.6	3.3	2.2	2.0	2.5	6.0	6.0
33	SPA-12 re-sample 1ª	J1FKM8	3/17/11	10.6	45.8	43.5	44	27	37	14	35	27	14

34 Statistical Computations

35		Nickel	Vanadium	Zinc	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Indeno(1,2,3-cd)pyrene	Phenanthrene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	33%	25%	42%	42%	33%	42%	50%
39	Mean	9.9	43.8	36.0	31	27	27	13	28	22	28
40	Standard deviation	1.5	7.6	8.2	55	39	45	21	40	30	51
41	95% UCL on mean	10.8	48.0	41.1	58	88.5	48	23	47	36	50
42	Maximum value	12.8	59.2	48.6	230	170	190	87	160	120	240
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	100 ug/kg GW & River Protection	330 ug/kg GW & River Protection	240000 ug/kg GW Protection
44	WAC 173-340 3-PART TEST										
45	95% UCL > Cleanup Limit?	NA	NA	NA	YES	YES	YES	YES	NO	NO	NO
46	> 10% above Cleanup Limit?	NA	NA	NA	YES	YES	YES	YES	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	YES	YES	YES	YES	NO	NO	NO
48	WAC 173-340 Compliance?	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
Sheet No. 26 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data - Staging Pile Area**

	Sample	Sample	Sample	Pyrene			Bis(2-ethylhexyl)phthalate			Fluoride			Nitrogen in nitrate [b]			Nitrogen in Nitrite and Nitrate			Sulfate			TPH - diesel range			TPH - diesel range EXT		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	400		12	110	JB	46	0.81	U	0.81	0.43	B	0.31	0.36	U	0.36	1.7	B	1.7	6900		690	15000		1000
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	300		12	110	JB	46	0.84	U	0.84	0.41	B	0.32	0.37	U	0.37	1.9	B	1.8	2200	J	690	5700		1000
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	12	U	12	110	JB	46	0.83	U	0.83	0.35	B	0.32	0.35	U	0.35	2.1	B	1.7	690	U	690	1000	U	1000
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	12	U	12	110	JB	44	0.82	U	0.82	0.36	B	0.31	0.37	U	0.37	1.7	U	1.7	640	U	640	940	U	940
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	54		12	100	JB	45	0.86	U	0.86	0.36	B	0.32	0.37	U	0.37	2.0	B	1.8	690	U	690	1000	U	1000
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	30	J	12	130	JB	47	0.86	U	0.86	40.1		0.33	39.9		0.37	43.6		1.8	11000		710	41000		1000
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	51		12	130	JB	49	0.95	B	0.89	44.8		0.34	50.9		0.38	16.2		1.9	8500		720	30000		1100
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	54		12	120	JB	49	1.1	B	0.83	0.61	B	0.32	0.43	B	0.38	2.0	B	1.8	9600		720	35000		1100
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	70		12	120	JB	47	1.8	B	0.87	0.94	B	0.33	0.85		0.38	55.6		1.8	7100		690	12000		1000
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	21	J	13	120	JB	50	0.96	B	0.91	0.55	B	0.35	0.46	B	0.40	2.8	B	1.9	4400		740	7700		1100
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	12	U	12	110	JB	46	0.88	B	0.82	0.41	B	0.31	0.36	U	0.36	5.4		1.7	820	J	690	2100	J	1000
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	12	U	12	110	JB	45	1.1	B	0.84	1.1	B	0.32	1.1		0.36	9.1		1.8	690	U	690	1000	U	1000
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	65		12	130	JB	47	0.97	B	0.88	0.76	B	0.32	0.62	B	0.38	3.3	B	1.8	4000	J	700	8800		1000

19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Pyrene	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH - diesel range	TPH - diesel range EXT
21	Area	Number	Date	ug/kg	ug/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg
22	SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	350	110	0.41	0.42	0.16	1.8	4550	10350
23	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	6.0	110	0.42	0.35	0.18	2.1	345	500
24	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	6.0	110	0.41	0.36	0.19	0.9	320	470
25	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	54	100	0.43	0.36	0.19	2.0	345	500
26	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	30	130	0.43	40.1	39.9	43.6	11000	41000
27	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	51	130	0.95	44.8	50.9	16.2	8500	30000
28	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	54	120	1.1	0.61	0.43	2.0	9600	35000
29	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	70	120	1.8	0.94	0.85	55.6	7100	12000
30	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	21	120	0.96	0.55	0.46	2.8	4400	7700
31	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	6.0	110	0.88	0.41	0.18	5.4	820	2100
32	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	6.0	110	1.1	1.1	1.1	9.1	345	500
33	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	65	130	0.97	0.76	0.62	3.3	4000	8800

34 **Statistical Computations**

35		Pyrene	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH - diesel range	TPH - diesel range EXT
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	33%	0%	42%	0%	42%	8%	33%	33%
39	Mean	60	117	0.82	7.6	7.9	12.2	4269	12410
40	Standard deviation	95	10	0.42	16.3	17.7	18.3	3959	14620
41	95% UCL on mean	105	121	1.0	15.3	16.0	51.6	6149	19363
42	Maximum value	400	130	1.8	44.8	50.9	55.6	11000	41000
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	48000 ug/kg GW Protection	360 ug/kg River Protection	96.0 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection
44	**WAC 173-340 3-PART TEST**								
45	95% UCL > Cleanup Limit?	NO	NO	NA	NO	NO	NA	NO	NO
46	> 10% above Cleanup Limit?	NO	NO	NA	NO	NO	NA	NO	NO
47	Any sample > 2X Cleanup Limit?	NO	NO	NA	NO	NO	NA	NO	NO
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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1 **116-H-5 Statistical Calculations**
2 **Verification Data -Staging Pile Area**

	Sample Area	Sample Number	Sample Date	TPH - motor oil (high boiling) ug/kg	Q	PQL
5	SPA-8	J19YJ4	5/17/10	40800		10100
6	Duplicate of J19YJ4	J19YJ9	5/17/10	64900		10100
7	SPA-1	J19YH7	5/17/10	184000		9910
8	SPA-2	J19YH8	5/17/10	17400		9800
9	SPA-3	J19YH9	5/17/10	10400		10100
10	SPA-4	J19YJ0	5/17/10	8660	J	9920
11	SPA-5	J19YJ1	5/17/10	14900		9990
12	SPA-6	J19YJ2	5/17/10	141000		10100
13	SPA-7	J19YJ3	5/17/10	10500		9970
14	SPA-9	J19YJ5	5/17/10	60800		10100
15	SPA-10	J19YJ6	5/17/10	58900		10000
16	SPA-11	J19YJ7	5/17/10	39100		9930
17	SPA-12	J19YJ8	5/17/10	53900		10000

19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	TPH - motor oil (high boiling) ug/kg
22	SPA-8	J19YJ4/ J19YJ9	5/17/10	52850
23	SPA-1	J19YH7	5/17/10	184000
24	SPA-2	J19YH8	5/17/10	17400
25	SPA-3	J19YH9	5/17/10	10400
26	SPA-4	J19YJ0	5/17/10	8660
27	SPA-5	J19YJ1	5/17/10	14900
28	SPA-6	J19YJ2	5/17/10	141000
29	SPA-7	J19YJ3	5/17/10	10500
30	SPA-9	J19YJ5	5/17/10	60800
31	SPA-10	J19YJ6	5/17/10	58900
32	SPA-11	J19YJ7	5/17/10	39100
33	SPA-12	J19YJ8	5/17/10	53900

34 **Statistical Computations**

		TPH - motor oil (high boiling)	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	
37	N	12	
38	% < Detection limit	0%	
39	Mean	54368	
40	Standard deviation	56168	
41	95% UCL on mean	147061	
42	Maximum value	184000	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	200000 ug/kg	DE, GW & River Protection
44	**WAC 173-340 3-PART TEST**		
45	95% UCL > Cleanup Limit?	NO	
46	> 10% above Cleanup Limit?	NO	
47	Any sample > 2X Cleanup Limit?	NO	
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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1 **116-H-5 Maximum Calculations**
2 **Verification Data -Staging Pile Area**

3	Sample Area	Sample Number	Sample Date	Mercury			Molybdenum			Acenaphthylene			Anthracene		
4				mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.0054	U	0.0054	0.23	U	0.23	8.7	U	8.7	67		3.0
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0052	U	0.0052	0.27	U	0.27	8.6	U	8.6	48		2.9
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.0056	U	0.0056	0.23	U	0.23	9.3	U	9.3	3.1	U	3.1
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.0056	U	0.0056	0.25	U	0.25	27	J	9.3	3.1	U	3.1
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.0058	U	0.0058	0.23	U	0.23	8.8	U	8.8	3.5	J	3.0
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.013	B	0.0056	0.33	B	0.23	8.7	U	8.7	3.0	U	3.0
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0080	B	0.0057	0.23	U	0.23	9.3	U	9.3	3.2	U	3.2
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0083	B	0.0060	0.27	U	0.27	9.1	U	9.1	3.1	U	3.1
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.014	B	0.0056	0.28	U	0.28	9.2	U	9.2	3.1	U	3.1
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.0053	U	0.0053	0.26	U	0.26	9.7	U	9.7	3.3	U	3.3
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.0054	U	0.0054	0.26	U	0.26	8.8	U	8.8	3.0	U	3.0
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.0057	U	0.0057	0.22	U	0.22	9.1	U	9.1	3.1	U	3.1
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.011	BN	0.0054	0.23	U	0.23	9.3	U	9.3	3.2	U	3.2

3	Sample Area	Benzo(ghi)perylene			Dibenz[a,h]anthracene			Fluoranthene			Fluorene			Aroclor-1254		
4		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1[a]	96		7.0	26	JX	11	400		13	57		5.1	2.7	U	2.7
6	Duplicate of J1FKM0[a]	38	X	6.9	19	JX	11	290		12	31		5.1	2.6	U	2.6
7	SPA-1 re-sample 1[a]	7.4	U	7.4	11	U	11	13	U	13	5.4	U	5.4	2.6	U	2.6
8	SPA-2 re-sample 1[a]	7.4	U	7.4	11	U	11	13	U	13	5.4	U	5.4	2.5	U	2.5
9	SPA-3 re-sample 1[a]	7.0	U	7.0	11	U	11	45		13	5.1	U	5.1	2.6	U	2.6
10	SPA-5 re-sample 1[a]	7.0	U	7.0	11	U	11	17	JX	13	5.1	U	5.1	15		2.6
11	SPA-6 re-sample 1[a]	7.4	U	7.4	11	U	11	13	U	13	5.5	U	5.5	2.8	U	2.8
12	SPA-7 re-sample 1[a]	7.3	U	7.3	11	U	11	13	U	13	5.3	U	5.3	2.8	U	2.8
13	SPA-8 re-sample 1[a]	7.4	U	7.4	11	U	11	13	U	13	5.4	U	5.4	2.8	U	2.8
14	SPA-9 re-sample 1[a]	7.8	U	7.8	12	U	12	14	U	14	5.7	U	5.7	2.8	U	2.8
15	SPA-10 re-sample 1[a]	7.0	U	7.0	11	U	11	13	U	13	5.2	U	5.2	2.5	U	2.5
16	SPA-11 re-sample 1[a]	7.3	U	7.3	11	U	11	13	U	13	5.4	U	5.4	2.6	U	2.6
17	SPA-12 re-sample 1[a]	7.5	U	7.5	11	U	11	13	U	13	5.5	U	5.5	2.6	U	2.6

18
19 **Statistical Computations**

20		Mercury		Molybdenum		Acenaphthylene		Anthracene	
21	% < Detection limit	58%		92%		92%		83%	
22	Maximum value	0.014		0.33		27		67	
23	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	0.33	GW & River Protection	8	GW Protection	98000 ug/kg	GW Protection	240000 ug/kg	GW Protection
24	**3-PART TEST**								
25	Maximum > Cleanup Limit?	NA		NO		NO		NO	
26	> 10% above Cleanup Limit?	NA		NO		NO		NO	
27	Any sample > 2X Cleanup Limit?	NA		NO		NO		NO	
28	**3-Part Test Compliance?**	Because all values are below background (0.33 mg/kg) the 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

20		Benzo(ghi)perylene		Dibenz[a,h]anthracene		Fluoranthene		Fluorene		Aroclor-1254	
21	% < Detection limit	92%		92%		75%		92%		92%	
22	Maximum value	96		26		400		57		15	
23	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	48000 ug/kg	GW & River Protection	30 ug/kg	GW & River Protection	18000 ug/kg	River Protection	64000 ug/kg	GW Protection	17 ug/kg	GW & River Protection
24	**3-PART TEST**										
25	Maximum > Cleanup Limit?	NO		NO		NO		NO		NO	
26	> 10% above Cleanup Limit?	NO		NO		NO		NO		NO	
27	Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO	
28	**3-Part Test Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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116-H-5 Maximum Calculations

Verification Data -Staging Pile Area

Sample Area	Sample Number	Sample Date	Aroclor-1260			4,4'-DDE			4,4'-DDT			Chloride		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	2.7	U	2.7	0.24	U	0.24	0.59	U	0.59	1.9	U	1.9
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	2.6	U	2.6	0.25	U	0.25	0.61	U	0.61	2.0	U	2.0
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	2.6	U	2.6	0.24	U	0.24	0.59	U	0.59	2.0	U	2.0
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	2.5	U	2.5	0.24	U	0.24	0.60	U	0.60	2.0	U	2.0
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	2.6	U	2.6	0.25	U	0.25	0.61	U	0.61	2.0	U	2.0
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	10		2.6	14		0.25	5.3		0.61	9.5		2.0
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	2.8	U	2.8	40	DN	0.51	4.4		0.63	6.4		2.1
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	2.8	U	2.8	1.1	J	0.25	0.74	J	0.63	2.0	U	2.0
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	2.8	U	2.8	0.46	JX	0.25	0.62	U	0.62	2.1	U	2.1
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	2.8	U	2.8	0.26	U	0.26	0.65	U	0.65	2.2	U	2.2
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	2.5	U	2.5	0.24	U	0.24	0.59	U	0.59	2.0	U	2.0
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	2.6	U	2.6	0.24	U	0.24	0.58	U	0.58	5.0	B	2.0
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	2.6	U	2.6	0.33	JX	0.25	0.61	U	0.61	2.0	U	2.0

Statistical Computations

	Aroclor-1260		4,4'-DDE		4,4'-DDT		Chloride	
% < Detection limit	92%		58%		75%		75%	
Maximum value	10		40		5.3		9.5	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	17 ug/kg	GW & River Protection	3.3 ug/kg	River Protection	3.3 ug/kg	River Protection	25000	GW Protection
3-PART TEST								
Maximum > Cleanup Limit?	NO		YES		YES		NA	
> 10% above Cleanup Limit?	NO		YES		YES		NA	
Any sample > 2X Cleanup Limit?	NO		YES		NO		NA	
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG		The data set meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the direct exposure RAG.		Because all values are below background (100 mg/kg) the 3-part test is not required.	

CALCULATION SHEET

Washington Closure Hanford
Originator: J. D. Skoglie
Project: 100-H Field Remediation
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date: 05/17/11
Job No.: 14655

Calc. No.: 0100H-CA-V0164
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Ecology Software (MTCAStat) Results, 116-H-5 Shallow Zone

Arsenic 95% UCL Calculation

DATA	ID
4.13	J19YB9/ J19YD0
2.13	J19YB8
2.83	J19YC0
5.32	J19YC1
6.45	J19YC2
3.75	J19YC3
6.58	J19YC4
4.84	J19YC5
4.80	J1FKL4
7.65	J19YC7
1.10	J1FKL5
3.08	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	4.39
Censored		Lognormal mean	4.54
Detection limit or PQL		Std. devn.	1.94
Method detection limit		Median	4.47
TOTAL	12	Min.	1.10
		Max.	7.65

Lognormal distribution? r-squared is: 0.919
Normal distribution? r-squared is: 0.991
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.53

Barium 95% UCL Calculation

DATA	ID
64.0	J19YB9/ J19YD0
33.6	J19YB8
69.8	J19YC0
51.9	J19YC1
46.7	J19YC2
63.4	J19YC3
52.0	J19YC4
62.2	J19YC5
69.6	J1FKL4
54.8	J19YC7
43.0	J1FKL5
50.7	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	55.1
Censored		Lognormal mean	55.3
Detection limit or PQL		Std. devn.	11.0
Method detection limit		Median	53.4
TOTAL	12	Min.	33.6
		Max.	69.8

Lognormal distribution? r-squared is: 0.929
Normal distribution? r-squared is: 0.960
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 62.4

Beryllium 95% UCL Calculation

DATA	ID
0.248	J19YB9/ J19YD0
0.130	J19YB8
0.208	J19YC0
0.172	J19YC1
0.192	J19YC2
0.216	J19YC3
0.193	J19YC4
0.206	J19YC5
0.110	J1FKL4
0.181	J19YC7
0.015	J1FKL5
0.156	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.169
Censored		Lognormal mean	0.193
Detection limit or PQL		Std. devn.	0.061
Method detection limit		Median	0.187
TOTAL	12	Min.	0.015
		Max.	0.248

Lognormal distribution? r-squared is: 0.568
Normal distribution? r-squared is: 0.865
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.198

Boron 95% UCL Calculation

DATA	ID
1.17	J19YB9/ J19YD0
0.76	J19YB8
3.44	J19YC0
1.26	J19YC1
1.12	J19YC2
1.26	J19YC3
1.18	J19YC4
1.34	J19YC5
1.00	J1FKL4
0.97	J19YC7
0.43	J1FKL6
1.00	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	1.24
Censored		Lognormal mean	1.24
Detection limit or PQL		Std. devn.	0.74
Method detection limit		Median	1.14
TOTAL	12	Min.	0.43
		Max.	3.44

Lognormal distribution? r-squared is: 0.813
Normal distribution? r-squared is: 0.613
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.59

Cadmium 95% UCL Calculation

DATA	ID
0.093	J19YB9/ J19YD0
0.041	J19YB8
0.086	J19YC0
0.065	J19YC1
0.060	J19YC2
0.059	J19YC3
0.052	J19YC4
0.101	J19YC5
0.074	J1FKL4
0.059	J19YC7
0.070	J1FKL5
0.105	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.072
Censored		Lognormal mean	0.072
Detection limit or PQL		Std. devn.	0.020
Method detection limit		Median	0.068
TOTAL	12	Min.	0.041
		Max.	0.105

Lognormal distribution? r-squared is: 0.969
Normal distribution? r-squared is: 0.957
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.0853

Chromium 95% UCL Calculation

DATA	ID
18.6	J19YB9/ J19YD0
6.93	J19YB8
12.7	J19YC0
10.4	J19YC1
11.0	J19YC2
12.8	J19YC3
11.7	J19YC4
12.6	J19YC5
9.90	J1FKL4
10.2	J19YC7
5.30	J1FKL5
13.1	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	11.4
Censored		Lognormal mean	11.5
Detection limit or PQL		Std. devn.	3.12
Method detection limit		Median	11.4
TOTAL	12	Min.	5.30
		Max.	18.6

Lognormal distribution? r-squared is: 0.859
Normal distribution? r-squared is: 0.890
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.9

Cobalt 95% UCL Calculation

DATA	ID
5.88	J19YB9/ J19YD0
4.91	J19YB8
5.79	J19YC0
6.11	J19YC1
5.45	J19YC2
6.41	J19YC3
5.82	J19YC4
5.85	J19YC5
6.60	J1FKL4
5.60	J19YC7
7.60	J1FKL6
5.38	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	5.93
Censored		Lognormal mean	5.94
Detection limit or PQL		Std. devn.	0.69
Method detection limit		Median	5.81
TOTAL	12	Min.	4.91
		Max.	7.60

Lognormal distribution? r-squared is: 0.934
Normal distribution? r-squared is: 0.901
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.30

Copper 95% UCL Calculation

DATA	ID
12.0	J19YB9/ J19YD0
12.2	J19YB8
13.1	J19YC0
16.1	J19YC1
13.0	J19YC2
12.8	J19YC3
13.3	J19YC4
12.0	J19YC5
17.3	J1FKL4
14.3	J19YC7
14.5	J1FKL5
12.5	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	13.6
Censored		Lognormal mean	13.6
Detection limit or PQL		Std. devn.	1.68
Method detection limit		Median	13.1
TOTAL	12	Min.	12.0
		Max.	17.3

Lognormal distribution? r-squared is: 0.692
Normal distribution? r-squared is: 0.864
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 14.4

Lead 95% UCL Calculation

DATA	ID
5.04	J19YB9/ J19YD0
3.44	J19YB8
8.37	J19YC0
15.2	J19YC1
15.9	J19YC2
6.41	J19YC3
17.3	J19YC4
15.1	J19YC5
8.00	J1FKL4
24.2	J19YC7
2.30	J1FKL5
5.80	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	10.6
Censored		Lognormal mean	11.1
Detection limit or PQL		Std. devn.	6.76
Method detection limit		Median	8.19
TOTAL	12	Min.	2.30
		Max.	24.2

Lognormal distribution? r-squared is: 0.981
Normal distribution? r-squared is: 0.922
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.8

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Manganese 95% UCL Calculation

DATA	ID
287	J19YB9/ J19YD0
227	J19YB8
268	J19YC0
257	J19YC1
283	J19YC2
274	J19YC3
272	J19YC4
270	J19YC5
284	J1FKL4
266	J19YC7
234	J1FKL5
251	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	261
Censored		Lognormal mean	261
Detection limit or PQL		Std. devn.	16.6
Method detection limit		Median	267
TOTAL	12	Min.	227
		Max.	284

Lognormal distribution? Normal distribution?
r-squared is: 0.876 r-squared is: 0.893
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 269

Molybdenum 95% UCL Calculation

DATA	ID
0.269	J19YB9/ J19YD0
0.252	J19YB8
0.271	J19YC0
0.278	J19YC1
0.233	J19YC2
0.321	J19YC3
0.260	J19YC4
0.252	J19YC5
0.125	J1FKL4
0.250	J19YC7
0.115	J1FKL5
0.298	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.243
Censored		Lognormal mean	0.246
Detection limit or PQL		Std. devn.	0.062
Method detection limit		Median	0.256
TOTAL	12	Min	0.115
		Max.	0.321

Lognormal distribution? Normal distribution?
r-squared is: 0.713 r-squared is: 0.803
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.273

Nickel 95% UCL Calculation

DATA	ID
13.9	J19YB9/ J19YD0
8.94	J19YB8
10.9	J19YC0
9.84	J19YC1
10.0	J19YC2
10.8	J19YC3
10.0	J19YC4
10.2	J19YC5
11.1	J1FKL4
9.63	J19YC7
11.5	J1FKL5
12.5	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	10.8
Censored		Lognormal mean	10.8
Detection limit or PQL		Std. devn.	1.36
Method detection limit		Median	10.5
TOTAL	12	Min.	8.94
		Max.	13.9

Lognormal distribution? Normal distribution?
r-squared is: 0.940 r-squared is: 0.909
Recommendations.
Use lognormal distribution.

UCL (Land's method) is 11.5

Vanadium 95% UCL Calculation

DATA	ID
48.2	J19YB9/ J19YD0
42.9	J19YB8
47.0	J19YC0
48.8	J19YC1
46.1	J19YC2
52.8	J19YC3
49.4	J19YC4
45.2	J19YC5
42.6	J1FKL4
45.4	J19YC7
47.4	J1FKL5
46.6	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	46.7
Censored		Lognormal mean	46.7
Detection limit or PQL		Std. devn.	2.74
Method detection limit		Median	46.7
TOTAL	12	Min.	42.6
		Max	52.8

Lognormal distribution? Normal distribution?
r-squared is: 0.944 r-squared is: 0.934
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 48.2

Zinc 95% UCL Calculation

DATA	ID
35.9	J19YB9/ J19YD0
29.0	J19YB8
68.7	J19YC0
38.0	J19YC1
33.4	J19YC2
39.2	J19YC3
35.8	J19YC4
69.8	J19YC5
35.2	J1FKL4
34.8	J19YC7
34.3	J1FKL5
35.5	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	40.8
Censored		Lognormal mean	40.7
Detection limit or PQL		Std. devn.	13.5
Method detection limit		Median	35.7
TOTAL	12	Min.	29.0
		Max.	69.8

Lognormal distribution? Normal distribution?
r-squared is: 0.698 r-squared is: 0.630
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 47.2

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
1.40	J19YB9/ J19YD0
1.05	J19YB8
4.71	J19YC0
7.32	J19YC1
8.99	J19YC2
3.11	J19YC3
11.2	J19YC4
8.59	J19YC5
10.0	J1FKL4
15.5	J19YC7
23.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.88
Censored		Lognormal mean	8.80
Detection limit or PQL		Std. devn.	6.50
Method detection limit		Median	6.96
TOTAL	12	Min.	1.05
		Max	23.0

Lognormal distribution? Normal distribution?
r-squared is: 0.959 r-squared is: 0.898
Recommendations.
Use lognormal distribution.

UCL (Land's method) is 20.8

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
1.57	J19YB9/ J19YD0
1.78	J19YB8
5.05	J19YC0
6.97	J19YC1
8.99	J19YC2
3.98	J19YC3
11.4	J19YC4
8.15	J19YC5
11.0	J1FKL4
15.8	J19YC7
18.0	J1FKL5
1.19	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.82
Censored		Lognormal mean	8.71
Detection limit or PQL		Std. devn.	5.52
Method detection limit		Median	7.56
TOTAL	12	Min.	1.19
		Max	18.0

Lognormal distribution? Normal distribution?
r-squared is: 0.929 r-squared is: 0.952
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.8

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
1.35	J19YB9/ J19YD0
0.88	J19YB8
6.73	J19YC0
11.3	J19YC1
9.17	J19YC2
7.95	J19YC3
18.4	J19YC4
12.0	J19YC5
5.70	J1FKL4
24.9	J19YC7
20.0	J1FKL5
1.19	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	10.0
Censored		Lognormal mean	12.3
Detection limit or PQL		Std. devn.	7.79
Method detection limit		Median	8.56
TOTAL	12	Min.	0.88
		Max.	24.9

Lognormal distribution? Normal distribution?
r-squared is: 0.893 r-squared is: 0.936
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 14.0

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
1.48	J19YB9/ J19YD0
1.76	J19YB8
3.87	J19YC0
1.74	J19YC1
6.52	J19YC2
3.63	J19YC3
10.1	J19YC4
9.38	J19YC5
3.80	J1FKL4
23.4	J19YC7
3.60	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	5.91
Censored		Lognormal mean	5.88
Detection limit or PQL		Std. devn.	6.23
Method detection limit		Median	3.72
TOTAL	12	Min.	1.48
		Max	23.4

Lognormal distribution? Normal distribution?
r-squared is: 0.922 r-squared is: 0.669
Recommendations:
Use lognormal distribution

UCL (Land's method) is 11.7

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.76	J19YB8
2.52	J19YC0
3.49	J19YC1
3.88	J19YC2
1.73	J19YC3
5.77	J19YC4
3.99	J19YC5
5.80	J1FKL4
6.59	J19YC7
10.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	4.25
Censored		Lognormal mean	4.32
Detection limit or PQL		Std. devn.	2.79
Method detection limit		Median	3.69
TOTAL	12	Min.	1.70
		Max.	10.0

Lognormal distribution? r-squared is: 0.929
Normal distribution? r-squared is: 0.887
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.75

Chrysene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.05	J19YB8
5.38	J19YC0
8.37	J19YC1
11.5	J19YC2
2.94	J19YC3
16.4	J19YC4
4.88	J19YC5
10.0	J1FKL4
12.2	J19YC7
18.0	J1FKL5
0.85	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.77
Censored		Lognormal mean	9.08
Detection limit or PQL		Std. devn.	5.92
Method detection limit		Median	6.88
TOTAL	12	Min.	0.85
		Max	18.0

Lognormal distribution? r-squared is. 0.932
Normal distribution? r-squared is: 0.944
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 23.6

Fluoranthene 95% UCL Calculation

DATA	ID
2.25	J19YB9/ J19YD0
2.46	J19YB8
21.4	J19YC0
19.9	J19YC1
31.2	J19YC2
9.34	J19YC3
27.1	J19YC4
25.0	J19YC5
7.00	J1FKL4
38.5	J19YC7
48.0	J1FKL5
3.06	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	19.6
Censored		Lognormal mean	23.5
Detection limit or PQL		Std. devn.	15.1
Method detection limit		Median	20.7
TOTAL	12	Min	2.25
		Max.	48.0

Lognormal distribution? r-squared is: 0.900
Normal distribution? r-squared is: 0.942
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 66.6

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.76	J19YB8
4.54	J19YC0
7.15	J19YC1
6.70	J19YC2
5.01	J19YC3
9.97	J19YC4
8.32	J19YC5
6.50	J1FKL4
16.8	J19YC7
14.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.02
Censored		Lognormal mean	7.46
Detection limit or PQL		Std. devn.	4.75
Method detection limit		Median	6.60
TOTAL	12	Min.	1.70
		Max.	16.8

Lognormal distribution? r-squared is: 0.926
Normal distribution? r-squared is: 0.920
Recommendations.
Use lognormal distribution.

UCL (Land's method) is 13.6

Phenanthrene 95% UCL Calculation

DATA	ID
1.18	J19YB9/ J19YD0
1.88	J19YB8
7.57	J19YC0
5.93	J19YC1
11.6	J19YC2
3.98	J19YC3
10.5	J19YC4
9.88	J19YC5
6.50	J1FKL4
10.8	J19YC7
31.0	J1FKL5
1.53	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	8.50
Censored		Lognormal mean	9.30
Detection limit or PQL		Std. devn.	8.03
Method detection limit		Median	7.04
TOTAL	12	Min.	1.18
		Max.	31.0

Lognormal distribution? r-squared is: 0.926
Normal distribution? r-squared is: 0.743
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 21.7

Pyrene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.23	J19YB8
14.5	J19YC0
17.3	J19YC1
23.1	J19YC2
6.40	J19YC3
29.4	J19YC4
16.5	J19YC5
48.0	J1FKL4
3.08	J19YC7
47.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	17.7
Censored		Lognormal mean	23.3
Detection limit or PQL		Std. devn.	14.8
Method detection limit		Median	15.5
TOTAL	12	Min.	1.23
		Max.	47.0

Lognormal distribution? r-squared is: 0.892
Normal distribution? r-squared is: 0.924
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 25.4

Fluoride 95% UCL Calculation

DATA	ID
0.8	J19YB9/ J19YD0
0.5	J19YB8
0.7	J19YC0
0.8	J19YC1
0.4	J19YC2
0.4	J19YC3
0.9	J19YC4
0.9	J19YC5
1.5	J1FKL4
0.5	J19YC7
0.4	J1FKL5
1.2	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.7
Censored		Lognormal mean	0.7
Detection limit or PQL		Std. devn.	0.3
Method detection limit		Median	0.7
TOTAL	12	Min.	0.4
		Max.	1.5

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.896
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.98

Nitrogen in nitrate 95% UCL Calculation

DATA	ID
0.7	J19YB9/ J19YD0
0.8	J19YB8
0.2	J19YC0
1.1	J19YC1
1.8	J19YC2
1.9	J19YC3
0.7	J19YC4
3.4	J19YC5
1.1	J1FKL4
2.1	J19YC7
0.4	J1FKL5
0.8	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	1.2
Censored		Lognormal mean	1.3
Detection limit or PQL		Std. devn.	0.9
Method detection limit		Median	0.9
TOTAL	12	Min.	0.2
		Max.	3.4

Lognormal distribution? r-squared is: 0.949
Normal distribution? r-squared is. 0.878
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.44

Nitrogen in nitrate and nitrite 95% UCL Calculation

DATA	ID
0.6	J19YB9/ J19YD0
1.4	J19YB8
0.2	J19YC0
0.7	J19YC1
1.2	J19YC2
1.0	J19YC3
0.7	J19YC4
2.4	J19YC5
0.5	J1FKL4
1.7	J19YC7
0.2	J1FKL5
0.5	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.9
Censored		Lognormal mean	1.0
Detection limit or PQL		Std. devn	0.7
Method detection limit		Median	0.7
TOTAL	12	Min.	0.2
		Max.	2.4

Lognormal distribution? r-squared is: 0.947
Normal distribution? r-squared is: 0.904
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.9

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Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

CALCULATION SHEET

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
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Ecology Software (MTCAStat) Results, 116-H-5 Shallow Zone

DATA	ID	Sulfate 95% UCL Calculation				DATA	ID	TPH-motor oil (high boiling) 95% UCL Calculation			
2.9	J19YB9/ J19YD0					5425	J19YB9/ J19YD0				
3.2	J19YB8					6260	J19YB8				
1.9	J19YC0	Number of samples		Uncensored values		27600	J19YC0	Number of samples		Uncensored values	
4.6	J19YC1	Uncensored	12	Mean	5.7	4760	J19YC1	Uncensored	12	Mean	8944
5.4	J19YC2	Censored		Lognormal mean	5.8	5300	J19YC2	Censored		Lognormal mean	8443
10	J19YC3	etection limit or PQL		Std. devn.	3.8	4330	J19YC3	etection limit or PQL		Std. devn.	9284
6.2	J19YC4	lethod detection limit		Median	5.0	4900	J19YC4	lethod detection limit		Median	5175
14	J19YC5	TOTAL	12	Min.	1.9	3850	J19YC5	TOTAL	12	Min.	3850
5.8	J1FKL4			Max.	14	29900	J19YC6			Max.	29900
9.3	J19YC7					4620	J19YC7				
2.1	J1FKL5					6290	J19YC8				
2.6	J19YC9					5100	J19YC9				
		Lognormal distribution?		Normal distribution?				Lognormal distribution?		Normal distribution?	
		r-squared is: 0.973		r-squared is: 0.880				r-squared is: 0.830		r-squared is: 0.528	
		Recommendations:						Recommendations:			
		Use lognormal distribution.						Reject BOTH lognormal and normal distributions			
		UCL (Land's method) is		9.2				UCL (based on Z-statistic) is		13352	

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

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Ecology Software (MTCAStat) Results, 116-H-5 Deep Zone

Arsenic 95% UCL Calculation

DATA	ID
6.4	J1HH85/ J1HH86
7.0	J1HH80
2.5	J1HH81
1.9	J1HH82
4.8	J1HH83
9.8	J1FKK5
1.8	J1FKK6
4.2	J1HH84
1.1	J1FKK9
2.4	J1FKL0
2.8	J1FKL1
3.2	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	4.0
Censored		Lognormal mean	4.1
Detection limit or PQL		Std. devn.	2.6
Method detection limit		Median	3.0
TOTAL	12	Min.	1.1
		Max.	9.8

Lognormal distribution? r-squared is: 0.986
Normal distribution? r-squared is: 0.890
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.3

Barium 95% UCL Calculation

DATA	ID
42.8	J1HH85/ J1HH86
60.9	J1HH80
57.7	J1HH81
59.7	J1HH82
68.3	J1HH83
35.5	J1FKK5
50.3	J1FKK6
34.7	J1HH84
77.1	J1FKK9
57.4	J1FKL0
69.0	J1FKL1
90.3	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	58.6
Censored		Lognormal mean	58.9
Detection limit or PQL		Std. devn.	16.5
Method detection limit		Median	58.7
TOTAL	12	Min.	34.7
		Max.	90.3

Lognormal distribution? r-squared is: 0.958
Normal distribution? r-squared is: 0.970
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 69.8

Beryllium 95% UCL Calculation

DATA	ID
0.125	J1HH85/ J1HH86
0.130	J1HH80
0.063	J1HH81
0.042	J1HH82
0.160	J1HH83
0.016	J1FKK5
0.015	J1FKK6
0.098	J1HH84
0.016	J1FKK9
0.017	J1FKL0
0.074	J1FKL1
0.017	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	0.064
Censored		Lognormal mean	0.070
Detection limit or PQL		Std. devn.	0.053
Method detection limit		Median	0.053
TOTAL	12	Min.	0.015
		Max.	0.160

Lognormal distribution? r-squared is: 0.870
Normal distribution? r-squared is: 0.878
Recommendations.
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.089

Cadmium 95% UCL Calculation

DATA	ID
0.165	J1HH85/ J1HH86
0.087	J1HH80
0.046	J1HH81
0.042	J1HH82
0.081	J1HH83
0.020	J1FKK5
0.052	J1FKK6
0.055	J1HH84
0.020	J1FKK9
0.021	J1FKL0
0.021	J1FKL1
0.064	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	0.054
Censored		Lognormal mean	0.055
Detection limit or PQL		Std. devn.	0.041
Method detection limit		Median	0.049
TOTAL	12	Min	0.020
		Max.	0.165

Lognormal distribution? r-squared is: 0.917
Normal distribution? r-squared is: 0.769
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.089

Chromium 95% UCL Calculation

DATA	ID
14.0	J1HH85/ J1HH86
9.80	J1HH80
6.20	J1HH81
15.1	J1HH82
12.9	J1HH83
7.60	J1FKK5
7.20	J1FKK6
8.80	J1HH84
6.50	J1FKK9
8.70	J1FKL0
11.6	J1FKL1
8.30	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	9.72
Censored		Lognormal mean	9.75
Detection limit or PQL		Std. devn.	2.98
Method detection limit		Median	8.75
TOTAL	12	Min.	6.20
		Max.	15.1

Lognormal distribution? r-squared is: 0.963
Normal distribution? r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.6

Cobalt 95% UCL Calculation

DATA	ID
5.4	J1HH85/ J1HH86
6.2	J1HH80
6.4	J1HH81
6.6	J1HH82
6.3	J1HH83
5.1	J1FKK5
5.5	J1FKK6
4.7	J1HH84
5.5	J1FKK9
5.7	J1FKL0
6.4	J1FKL1
6.7	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	5.9
Censored		Lognormal mean	5.9
Detection limit or PQL		Std. devn.	0.6
Method detection limit		Median	6.0
TOTAL	12	Min.	4.7
		Max.	6.7

Lognormal distribution? r-squared is: 0.936
Normal distribution? r-squared is: 0.944
Recommendations:
Use lognormal distribution

UCL (Land's method) is 6.2

Copper 95% UCL Calculation

DATA	ID
17.4	J1HH85/ J1HH86
14.0	J1HH80
15.3	J1HH81
13.4	J1HH82
14.4	J1HH83
12.8	J1FKK5
15.4	J1FKK6
11.7	J1HH84
12.7	J1FKK9
13.6	J1FKL0
15.9	J1FKL1
15.8	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	14.4
Censored		Lognormal mean	14.4
Detection limit or PQL		Std. devn.	1.63
Method detection limit		Median	14.2
TOTAL	12	Min.	11.7
		Max.	17.4

Lognormal distribution? r-squared is: 0.982
Normal distribution? r-squared is: 0.980
Recommendations.
Use lognormal distribution.

UCL (Land's method) is 15.3

Lead 95% UCL Calculation

DATA	ID
15.8	J1HH85/ J1HH86
18.5	J1HH80
4.20	J1HH81
2.90	J1HH82
11.4	J1HH83
31.3	J1FKK5
8.40	J1FKK6
11.3	J1HH84
3.50	J1FKK9
8.00	J1FKL0
8.40	J1FKL1
9.80	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	11.0
Censored		Lognormal mean	11.2
Detection limit or PQL		Std. devn.	7.98
Method detection limit		Median	9.10
TOTAL	12	Min	2.90
		Max.	31.3

Lognormal distribution? r-squared is: 0.980
Normal distribution? r-squared is: 0.842
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.7

Manganese 95% UCL Calculation

DATA	ID
225	J1HH85/ J1HH86
283	J1HH80
252	J1HH81
231	J1HH82
261	J1HH83
209	J1FKK5
217	J1FKK6
206	J1HH84
219	J1FKK9
230	J1FKL0
260	J1FKL1
284	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	240
Censored		Lognormal mean	240
Detection limit or PQL		Std. devn.	27.4
Method detection limit		Median	231
TOTAL	12	Min.	206
		Max.	284

Lognormal distribution? r-squared is: 0.940
Normal distribution? r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 255

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CALCULATION SHEET

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Job No. 14655

Calc. No. 0100H-CA-V0164
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Ecology Software (MTCAStat) Results, 116-H-5 Deep Zone

Nickel 95% UCL Calculation

DATA	ID
10.6	J1HH85/ J1HH86
10.6	J1HH80
8.10	J1HH81
12.8	J1HH82
11.5	J1HH83
10.1	J1FKK5
9.20	J1FKK6
12.2	J1HH84
6.80	J1FKK9
9.20	J1FKL0
13.5	J1FKL1
11.3	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	10.5
Censored		Lognormal mean	10.5
Detection limit or PQL		Std. devn.	1.96
Method detection limit		Median	10.6
TOTAL	12	Min.	6.80
		Max.	13.5

Lognormal distribution? Normal distributon?
r-squared is: 0.956 r-squared is: 0 965
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.7

Vanadium 95% UCL Calculation

DATA	ID
36.5	J1HH85/ J1HH86
40.3	J1HH80
48.7	J1HH81
56.4	J1HH82
41.9	J1HH83
33.6	J1FKK5
39.4	J1FKK6
30.5	J1HH84
47.9	J1FKK9
35.4	J1FKL0
40.9	J1FKL1
54.7	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	42.2
Censored		Lognormal mean	42.2
Detection limit or PQL		Std. devn.	8.18
Method detection limit		Median	40.6
TOTAL	12	Min.	30.5
		Max.	55.4

Lognormal distribution? Normal distribution?
r-squared is: 0.978 r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 47.0

Zinc 95% UCL Calculation

DATA	ID
69.0	J1HH85/ J1HH86
39.0	J1HH80
35.5	J1HH81
34.4	J1HH82
38.9	J1HH83
27.4	J1FKK5
31.6	J1FKK6
29.6	J1HH84
30.9	J1FKK9
31.3	J1FKL0
44.7	J1FKL1
46.2	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	38.2
Censored		Lognormal mean	38.2
Detection limit or PQL		Std. devn.	11.3
Method detection limit		Median	35.0
TOTAL	12	Min.	27.4
		Max.	69.0

Lognormal distribution? Normal distribution?
r-squared is: 0.879 r-squared is: 0.775
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 43.6

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
76	J1HH85/ J1HH86
94	J1HH80
80	J1HH81
72	J1HH82
39	J1HH83
24	J1FKK5
24	J1FKK6
78	J1HH84
23	J1FKK9
24	J1FKL0
26	J1FKL1
24	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	53
Censored		Lognormal mean	54
Detection limit or PQL		Std. devn.	31
Method detection limit		Median	49
TOTAL	12	Min.	23
		Max.	94

Lognormal distribution? Normal distribution?
r-squared is: 0.769 r-squared is: 0.794
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 67

Fluoride 95% UCL Calculation

DATA	ID
1.1	J1HH85/ J1HH86
0.8	J1HH80
0.7	J1HH81
0.9	J1HH82
1.7	J1HH83
1.0	J1FKK5
1.3	J1FKK6
0.6	J1HH84
0.3	J1FKK9
0.4	J1FKL0
1.1	J1FKL1
1.1	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	0.9
Censored		Lognormal mean	0.9
Detection limit or PQL		Std. devn.	0.4
Method detection limit		Median	1.0
TOTAL	12	Min.	0.3
		Max.	1.7

Lognormal distribution? Normal distribution?
r-squared is: 0.948 r-squared is: 0.985
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.3

Nitrogen in nitrate 95% UCL Calculation

DATA	ID
2.71	J1HH85/ J1HH86
1.02	J1HH80
55.8	J1HH81
26.7	J1HH82
2.26	J1HH83
7.59	J1FKK5
5.38	J1FKK6
1.13	J1HH84
0.79	J1FKK9
3.19	J1FKL0
4.02	J1FKL1
5.11	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	9.64
Censored		Lognormal mean	9.16
Detection limit or PQL		Std. devn.	16.1
Method detection limit		Median	3.60
TOTAL	12	Min.	0.79
		Max.	55.8

Lognormal distribution? Normal distribution?
r-squared is: 0.935 r-squared is: 0.563
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 34.0

Nitrogen in nitrate and nitrite 95% UCL Calculation

DATA	ID
1.66	J1HH85/ J1HH86
0.66	J1HH80
43.4	J1HH81
22.7	J1HH82
1.40	J1HH83
5.36	J1FKK5
5.87	J1FKK6
0.79	J1HH84
0.63	J1FKK9
2.08	J1FKL0
2.94	J1FKL1
4.37	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	7.64
Censored		Lognormal mean	7.43
Detection limit or PQL		Std. devn.	12.8
Method detection limit		Median	2.51
TOTAL	12	Min.	0.63
		Max.	43.4

Lognormal distribution? Normal distribution?
r-squared is: 0.935 r-squared is: 0.579
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 31.3

Sulfate 95% UCL Calculation

DATA	ID
8	J1HH85/ J1HH86
5	J1HH80
160	J1HH81
101	J1HH82
8	J1HH83
18	J1FKK5
19	J1FKK6
10	J1HH84
6	J1FKK9
11	J1FKL0
19	J1FKL1
25	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	33
Censored		Lognormal mean	30
Detection limit or PQL		Std. devn.	48
Method detection limit		Median	14
TOTAL	12	Min.	5
		Max.	160

Lognormal distribution? Normal distribution?
r-squared is: 0.882 r-squared is: 0.588
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 55.2

TPH-motor oil (high boiling) 95% UCL Calculation

DATA	ID
4575	J1HH85/ J1HH86
5200	J1HH80
5300	J1HH81
5150	J1HH82
9290	J1HH83
5250	J1FKK5
127000	J1FKK6
4230	J1HH84
18700	J1FKK9
6750	J1FKL0
6760	J1FKL1
8670	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	17240
Censored		Lognormal mean	13175
Detection limit or PQL		Std. devn.	34789
Method detection limit		Median	6025
TOTAL	12	Min.	4230
		Max.	127000

Lognormal distribution? Normal distribution?
r-squared is: 0.653 r-squared is: 0.376
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 33760

CALCULATION SHEET

Washington Closure Hanford

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Ecology Software (MTCAStat) Results, 116-H-5 Overburden

Antimony 95% UCL Calculation

DATA	ID
0.366	J19YF8/ J19YH6
0.377	J19YF4
0.437	J19YF5
0.464	J19YF6
0.272	J19YF7
0.428	J19YF9
0.279	J19YH0
0.185	J1FKL6
0.387	J19YH2
0.309	J19YH3
0.491	J19YH4
0.469	J19YH5
0.254	J1B4H9
0.386	J1B4J0
0.274	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	0.358
Censored		Lognormal mean	0.360
Detection limit or PQL		Std. devn.	0.092
Method detection limit		Median	0.377
TOTAL	12	Min.	0.185
		Max.	0.491

Lognormal distribution? Normal distribution?
r-squared is: 0.930 r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.414

Arsenic 95% UCL Calculation

DATA	ID
4.85	J19YF8/ J19YH6
3.27	J19YF4
4.17	J19YF5
6.21	J19YF6
3.96	J19YF7
8.14	J19YF9
5.13	J19YH0
6.50	J1FKL6
3.59	J19YH2
4.77	J19YH3
6.82	J19YH4
5.29	J19YH5
4.23	J1B4H9
4.75	J1B4J0
6.10	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	5.19
Censored		Lognormal mean	5.20
Detection limit or PQL		Std. devn.	1.34
Method detection limit		Median	4.85
TOTAL	12	Min.	3.27
		Max.	8.14

Lognormal distribution? Normal distribution?
r-squared is: 0.987 r-squared is: 0.959
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.89

Barium 95% UCL Calculation

DATA	ID
49.3	J19YF8/ J19YH6
50.9	J19YF4
51.8	J19YF5
47.8	J19YF6
48.5	J19YF7
54.4	J19YF9
43.1	J19YH0
49.8	J1FKL6
46.7	J19YH2
37.8	J19YH3
67.6	J19YH4
46.4	J19YH5
57.1	J1B4H9
46.2	J1B4J0
57.4	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	50.5
Censored		Lognormal mean	50.5
Detection limit or PQL		Std. devn.	6.91
Method detection limit		Median	49.3
TOTAL	12	Min.	37.8
		Max.	67.6

Lognormal distribution? Normal distribution?
r-squared is. 0.943 r-squared is: 0.922
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 53.8

Beryllium 95% UCL Calculation

DATA	ID
0.156	J19YF8/ J19YH6
0.153	J19YF4
0.161	J19YF5
0.169	J19YF6
0.162	J19YF7
0.197	J19YF9
0.149	J19YH0
0.120	J1FKL6
0.136	J19YH2
0.140	J19YH3
0.208	J19YH4
0.175	J19YH5
0.181	J1B4H9
0.147	J1B4J0
0.181	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	0.162
Censored		Lognormal mean	0.162
Detection limit or PQL		Std. devn.	0.023
Method detection limit		Median	0.161
TOTAL	12	Min.	0.120
		Max.	0.208

Lognormal distribution? Normal distribution?
r-squared is: 0.990 r-squared is: 0.967
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.174

Boron 95% UCL Calculation

DATA	ID
0.89	J19YF8/ J19YH6
0.85	J19YF4
0.96	J19YF5
0.92	J19YF6
0.90	J19YF7
1.17	J19YF9
0.81	J19YH0
1.30	J1FKL6
0.75	J19YH2
0.84	J19YH3
1.34	J19YH4
1.15	J19YH5
2.55	J1B4H9
1.70	J1B4J0
2.02	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	1.21
Censored		Lognormal mean	1.21
Detection limit or PQL		Std. devn	0.51
Method detection limit		Median	0.96
TOTAL	12	Min.	0.75
		Max.	2.55

Lognormal distribution? Normal distribution?
r-squared is: 0.890 r-squared is: 0.796
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.43

Cadmium 95% UCL Calculation

DATA	ID
0.110	J19YF8/ J19YH6
0.090	J19YF4
0.054	J19YF5
0.107	J19YF6
0.105	J19YF7
0.070	J19YF9
0.084	J19YH0
0.064	J1FKL6
0.097	J19YH2
0.117	J19YH3
0.064	J19YH4
0.039	J19YH5
0.088	J1B4H9
0.042	J1B4J0
0.057	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	0.078
Censored		Lognormal mean	0.078
Detection limit or PQL		Std. devn.	0.025
Method detection limit		Median	0.070
TOTAL	12	Min	0.039
		Max	0.117

Lognormal distribution? Normal distribution?
r-squared is: 0.954 r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.094

Chromium 95% UCL Calculation

DATA	ID
10.3	J19YF8/ J19YH6
13.2	J19YF4
11.4	J19YF5
10.7	J19YF6
11.7	J19YF7
11.7	J19YF9
9.84	J19YH0
10.6	J1FKL6
9.58	J19YH2
9.93	J19YH3
12.8	J19YH4
11.7	J19YH5
10.3	J1B4H9
11.0	J1B4J0
11.1	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	11.1
Censored		Lognormal mean	11.1
Detection limit or PQL		Std. devn.	1.05
Method detection limit		Median	11.0
TOTAL	12	Min	9.58
		Max.	13.2

Lognormal distribution? Normal distribution?
r-squared is: 0.989 r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.5

Cobalt 95% UCL Calculation

DATA	ID
5.29	J19YF8/ J19YH6
5.37	J19YF4
5.34	J19YF5
5.52	J19YF6
5.15	J19YF7
5.80	J19YF9
4.93	J19YH0
6.10	J1FKL6
4.95	J19YH2
5.27	J19YH3
5.9	J19YH4
5.39	J19YH5
5.36	J1B4H9
4.92	J1B4J0
5.90	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	5.41
Censored		Lognormal mean	5.41
Detection limit or PQL		Std. devn	0.37
Method detection limit		Median	5.38
TOTAL	12	Min.	4.92
		Max.	6.10

Lognormal distribution? Normal distribution?
r-squared is: 0.946 r-squared is: 0.941
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.58

Copper 95% UCL Calculation

DATA	ID
12.7	J19YF8/ J19YH6
13.5	J19YF4
14.3	J19YF5
13.5	J19YF6
13.8	J19YF7
13.2	J19YF9
13.4	J19YH0
13.6	J1FKL6
11.7	J19YH2
12.4	J19YH3
14.5	J19YH4
13.4	J19YH5
12.9	J1B4H9
12.2	J1B4J0
13.6	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	13.2
Censored		Lognormal mean	13.2
Detection limit or PQL		Std. devn.	0.76
Method detection limit		Median	13.4
TOTAL	12	Min.	11.7
		Max.	14.5

Lognormal distribution? Normal distribution?
r-squared is: 0.953 r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.6

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Ecology Software (MTCAStat) Results, 116-H-5 Overburden

DATA	ID	Hexavalent chromium 95% UCL Calculation			
0.13	J19YF8/ J19YH6				
0.15	J19YF4				
0.11	J19YF5	Number of samples		Uncensored values	
0.18	J19YF6	Uncensored	12	Mean	0.14
0.15	J19YF7	Censored		Lognormal mean	0.14
0.14	J19YF9	Detection limit or PQL		Std. devn.	0.03
0.20	J19YH0	Method detection limit		Median	0.14
0.18	J1FKL6	TOTAL	12	Min.	0.10
0.12	J19YH2			Max.	0.20
0.17	J19YH3				
0.15	J19YH4				
0.11	J19YH5				
0.10	J1B4H9				
0.10	J1B4J0	Lognormal distribution?		Normal distribution?	
0.10	J1B4J1	r-squared is: 0.947		r-squared is: 0.942	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	0.16		

DATA	ID	Lead 95% UCL Calculation			
13.1	J19YF8/ J19YH6				
7.0	J19YF4				
10.3	J19YF5	Number of samples		Uncensored values	
17.6	J19YF6	Uncensored	12	Mean	13.9
7.4	J19YF7	Censored		Lognormal mean	14.0
25.2	J19YF9	Detection limit or PQL		Std. devn.	5.26
16.8	J19YH0	Method detection limit		Median	13.1
17.9	J1FKL6	TOTAL	12	Min.	6.95
8.9	J19YH2			Max.	25.2
11.3	J19YH3				
22.4	J19YH4				
14.0	J19YH5				
10.5	J1B4H9				
12.3	J1B4J0	Lognormal distribution?		Normal distribution?	
14.3	J1B4J1	r-squared is: 0.989		r-squared is: 0.951	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	17.0		

DATA	ID	Manganese 95% UCL Calculation			
246	J19YF8/ J19YH6				
288	J19YF4				
259	J19YF5	Number of samples		Uncensored values	
261	J19YF6	Uncensored	12	Mean	250
256	J19YF7	Censored		Lognormal mean	250
272	J19YF9	Detection limit or PQL		Std. devn.	17
220	J19YH0	Method detection limit		Median	251
253	J1FKL6	TOTAL	12	Min.	220
224	J19YH2			Max.	276
244	J19YH3				
276	J19YH4				
248	J19YH5				
250	J1B4H9				
227	J1B4J0	Lognormal distribution?		Normal distribution?	
282	J1B4J1	r-squared is: 0.950		r-squared is. 0.960	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	258		

DATA	ID	Molybdenum 95% UCL Calculation			
0.338	J19YF8/ J19YH6				
0.250	J19YF4				
0.352	J19YF5	Number of samples		Uncensored values	
0.232	J19YF6	Uncensored	12	Mean	0.268
0.276	J19YF7	Censored		Lognormal mean	0.270
0.313	J19YF9	Detection limit or PQL		Std. devn.	0.084
0.227	J19YH0	Method detection limit		Median	0.272
0.125	J1FKL6	TOTAL	12	Min.	0.125
0.167	J19YH2			Max.	0.467
0.467	J19YH3				
0.199	J19YH4				
0.209	J19YH5				
0.272	J1B4H9				
0.306	J1B4J0	Lognormal distribution?		Normal distribution?	
0.289	J1B4J1	r-squared is: 0.968		r-squared is: 0.961	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	0.318		

DATA	ID	Nickel 95% UCL Calculation			
10.9	J19YF8/ J19YH6				
10.9	J19YF4				
11.0	J19YF5	Number of samples		Uncensored values	
10.1	J19YF6	Uncensored	12	Mean	10.3
10.5	J19YF7	Censored		Lognormal mean	10.3
9.82	J19YF9	Detection limit or PQL		Std. devn.	0.99
9.49	J19YH0	Method detection limit		Median	10.3
10.3	J1FKL6	TOTAL	12	Min.	8.89
8.89	J19YH2			Max.	11.9
9.11	J19YH3				
11.6	J19YH4				
11.9	J19YH5				
9.50	J1B4H9				
9.29	J1B4J0	Lognormal distribution?		Normal distribution?	
11.8	J1B4J1	r-squared is: 0.989		r-squared is: 0.986	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	10.8		

DATA	ID	Vanadium 95% UCL Calculation			
41.0	J19YF8/ J19YH6				
41.7	J19YF4				
46.4	J19YF5	Number of samples		Uncensored values	
45.3	J19YF6	Uncensored	12	Mean	43.2
43.6	J19YF7	Censored		Lognormal mean	43.3
46.5	J19YF9	Detection limit or PQL		Std. devn.	2.48
38.8	J19YH0	Method detection limit		Median	43.6
42.1	J1FKL6	TOTAL	12	Min	38.8
41.5	J19YH2			Max.	48.5
39.4	J19YH3				
45.5	J19YH4				
44.8	J19YH5				
45.1	J1B4H9				
42.1	J1B4J0	Lognormal distribution?		Normal distribution?	
44.9	J1B4J1	r-squared is: 0.939		r-squared is: 0.943	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	44.4		

DATA	ID	Zinc 95% UCL Calculation			
31.7	J19YF8/ J19YH6				
32.8	J19YF4				
41.2	J19YF5	Number of samples		Uncensored values	
33.3	J19YF6	Uncensored	12	Mean	38.9
33.2	J19YF7	Censored		Lognormal mean	38.9
39.0	J19YF9	Detection limit or PQL		Std. devn.	9.34
55.3	J19YH0	Method detection limit		Median	34.3
34.3	J1FKL6	TOTAL	12	Min.	29.4
30.1	J19YH2			Max.	59.6
29.4	J19YH3				
44.4	J19YH4				
33.1	J19YH5				
59.6	J1B4H9				
37.0	J1B4J0	Lognormal distribution?		Normal distribution?	
49.4	J1B4J1	r-squared is: 0.901		r-squared is: 0.857	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	43.4		

DATA	ID	Benzo(a)anthracene 95% UCL Calculation			
4.98	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
0.97	J19YF6	Uncensored	12	Mean	18.0
0.92	J19YF7	Censored		Lognormal mean	21.5
4.65	J19YF9	Detection limit or PQL		Std. devn.	25.3
55.5	J19YH0	Method detection limit		Median	10.2
18.0	J1FKL6	TOTAL	12	Min.	0.92
94.5	J19YH2			Max.	94.5
13.3	J19YH3				
21.3	J19YH4				
13.7	J19YH5				
10.2	J1B4H9				
6.98	J1B4J0	Lognormal distribution?		Normal distribution?	
22.3	J1B4J1	r-squared is: 0.988		r-squared is: 0.680	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	78.5		

DATA	ID	Benzo(a)pyrene 95% UCL Calculation			
5.82	J19YF8/ J19YH6				
1.68	J19YF4				
1.24	J19YF5	Number of samples		Uncensored values	
1.70	J19YF6	Uncensored	12	Mean	20.3
1.44	J19YF7	Censored		Lognormal mean	23.3
7.63	J19YF9	Detection limit or PQL		Std. devn.	27.1
68.8	J19YH0	Method detection limit		Median	7.63
17.0	J1FKL6	TOTAL	12	Min	1.24
85.3	J19YH2			Max.	85.3
11.9	J19YH3				
67.4	J19YH4				
12.8	J19YH5				
7.41	J1B4H9				
5.72	J1B4J0	Lognormal distribution?		Normal distribution?	
18.9	J1B4J1	r-squared is: 0.950		r-squared is: 0.706	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	83.1		

CALCULATION SHEET

Washington Closure Hanford					
Originator	J. D. Skoglie	Date	05/17/11	Calc. No.	0100H-CA-V0164
Project	100-H Field Remediation	Job No.	14655	Checked	T. E. Queen
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			Rev. No.	0
				Date	05/17/11
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Ecology Software (MTCAStat) Results, 116-H-5 Overburden

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID				
8.15	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
1.44	J19YF6	Uncensored	12	Mean	22.0
1.07	J19YF7	Censored		Lognormal mean	28.2
9.71	J19YF9	Detection limit or PQL		Std. devn.	26.3
71.0	J19YH0	Method detection limit		Median	11.7
18.0	J1FKL6	TOTAL	12	Min.	1.07
84.1	J19YH2			Max.	84.1
11.7	J19YH3				
53.5	J19YH4				
17.0	J19YH5				
15.4	J1B4H9				
8.78	J1B4J0	Lognormal distribution?		Normal distribution?	
27.5	J1B4J1	r-squared is: 0.941		r-squared is: 0.764	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	105		

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID				
3.96	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
1.56	J19YF6	Uncensored	12	Mean	17.4
0.84	J19YF7	Censored		Lognormal mean	17.5
9.53	J19YF9	Detection limit or PQL		Std. devn.	28.1
36.8	J19YH0	Method detection limit		Median	4.40
3.70	J1FKL6	TOTAL	12	Min.	0.84
64.5	J19YH2			Max.	98.0
9.20	J19YH3				
98.0	J19YH4				
9.28	J19YH5				
4.40	J1B4H9				
4.07	J1B4J0	Lognormal distribution?		Normal distribution?	
11.6	J1B4J1	r-squared is: 0.946		r-squared is: 0.610	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	62.9		

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID				
3.02	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
1.88	J19YF6	Uncensored	12	Mean	9.65
1.64	J19YF7	Censored		Lognormal mean	9.46
3.92	J19YF9	Detection limit or PQL		Std. devn.	12.5
30.4	J19YH0	Method detection limit		Median	3.92
9.20	J1FKL6	TOTAL	12	Min.	1.63
43.5	J19YH2			Max.	43.5
6.08	J19YH3				
22.1	J19YH4				
6.11	J19YH5				
3.40	J1B4H9				
2.53	J1B4J0	Lognormal distribution?		Normal distribution?	
7.86	J1B4J1	r-squared is: 0.915		r-squared is: 0.679	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	21.9		

Chrysene 95% UCL Calculation

DATA	ID				
2.47	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
1.68	J19YF6	Uncensored	12	Mean	24.3
1.46	J19YF7	Censored		Lognormal mean	28.2
5.51	J19YF9	Detection limit or PQL		Std. devn.	39.7
39.9	J19YH0	Method detection limit		Median	16.0
16.0	J1FKL6	TOTAL	12	Min.	1.46
160	J19YH2			Max.	160
34.1	J19YH3				
17.3	J19YH4				
23.7	J19YH5				
18.7	J1B4H9				
8.23	J1B4J0	Lognormal distribution?		Normal distribution?	
32.5	J1B4J1	r-squared is: 0.928		r-squared is: 0.547	
		Recommendations.			
		Use lognormal distribution.			
		UCL (Land's method) is	113		

Dibenz[a,h]anthracene 95% UCL Calculation

DATA	ID				
1.26	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
1.88	J19YF6	Uncensored	12	Mean	4.15
1.64	J19YF7	Censored		Lognormal mean	3.87
1.4	J19YF9	Detection limit or PQL		Std. devn.	5.06
6.73	J19YH0	Method detection limit		Median	1.67
5.50	J1FKL6	TOTAL	12	Min.	1.26
19.0	J19YH2			Max.	19.0
2.49	J19YH3				
10.8	J19YH4				
1.60	J19YH5				
1.67	J1B4H9				
1.67	J1B4J0	Lognormal distribution?		Normal distribution?	
1.49	J1B4J1	r-squared is: 0.738		r-squared is: 0.607	
		Recommendations:			
		Reject BOTH lognormal and normal distributions			
		UCL (based on Z-statistic) is	6.29		

Fluoranthene 95% UCL Calculation

DATA	ID				
15.1	J19YF8/ J19YH6				
3.98	J19YF4				
1.39	J19YF5	Number of samples		Uncensored values	
6.45	J19YF6	Uncensored	12	Mean	47.1
6.55	J19YF7	Censored		Lognormal mean	51.8
16.3	J19YF9	Detection limit or PQL		Std. devn.	73.5
161	J19YH0	Method detection limit		Median	17.9
6.50	J1FKL6	TOTAL	12	Min.	1.39
269	J19YH2			Max.	269
29.1	J19YH3				
54.8	J19YH4				
29.5	J19YH5				
24.6	J1B4H9				
17.9	J1B4J0	Lognormal distribution?		Normal distribution?	
65.9	J1B4J1	r-squared is: 0.980		r-squared is: 0.614	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	188		

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID				
4.87	J19YF8/ J19YH6				
0.84	J19YF4				
1.08	J19YF5	Number of samples		Uncensored values	
1.56	J19YF6	Uncensored	12	Mean	17.8
1.18	J19YF7	Censored		Lognormal mean	21.6
7.89	J19YF9	Detection limit or PQL		Std. devn.	23.6
42.40	J19YH0	Method detection limit		Median	8.95
14.00	J1FKL6	TOTAL	12	Min.	0.84
71.30	J19YH2			Max.	71.3
12.80	J19YH3				
68.8	J19YH4				
9.37	J19YH5				
8.96	J1B4H9				
5.05	J1B4J0	Lognormal distribution?		Normal distribution?	
16.5	J1B4J1	r-squared is: 0.955		r-squared is: 0.701	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	83.4		

Phenanthrene 95% UCL Calculation

DATA	ID				
4.93	J19YF8/ J19YH6				
1.31	J19YF4				
1.19	J19YF5	Number of samples		Uncensored values	
1.38	J19YF6	Uncensored	12	Mean	26.3
1.61	J19YF7	Censored		Lognormal mean	25.1
4.49	J19YF9	Detection limit or PQL		Std. devn.	52.9
86.9	J19YH0	Method detection limit		Median	7.35
15.0	J1FKL6	TOTAL	12	Min.	1.19
201	J19YH2			Max.	201
11.3	J19YH3				
14.1	J19YH4				
10.4	J19YH5				
7.35	J1B4H9				
6.48	J1B4J0	Lognormal distribution?		Normal distribution?	
26.8	J1B4J1	r-squared is: 0.940		r-squared is: 0.491	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	107		

Pyrene 95% UCL Calculation

DATA	ID				
12.2	J19YF8/ J19YH6				
1.44	J19YF4				
1.27	J19YF5	Number of samples		Uncensored values	
3.14	J19YF6	Uncensored	12	Mean	48.8
2.38	J19YF7	Censored		Lognormal mean	63.1
9.1	J19YF9	Detection limit or PQL		Std. devn.	79.7
176	J19YH0	Method detection limit		Median	18.3
34.0	J1FKL6	TOTAL	12	Min.	1.27
290	J19YH2			Max.	290
39.6	J19YH3				
51.9	J19YH4				
28.7	J19YH5				
18	J1B4H9				
13.8	J1B4J0	Lognormal distribution?		Normal distribution?	
49.6	J1B4J1	r-squared is: 0.970		r-squared is: 0.800	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	342		

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Ecology Software (MTCAStat) Results, 116-H-5 Overburden

DATA	ID	Fluoride 95% UCL Calculation			
0.7	J19YF8/ J19YH6				
0.7	J19YF4				
0.7	J19YF5	Number of samples		Uncensored values	
0.7	J19YF6	Uncensored	12	Mean	0.7
0.6	J19YF7	Censored		Lognormal mean	0.7
0.8	J19YF9	Detection limit or PQL		Std. devn.	0.2
0.8	J19YH0	Method detection limit		Median	0.7
1.1	J1FKL6	TOTAL	12	Min.	0.3
0.7	J19YH2			Max.	1.1
0.6	J19YH3				
1.0	J19YH4				
0.7	J19YH5				
0.5	J1B4H9				
0.7	J1B4J0	Lognormal distribution?		Normal distribution?	
0.3	J1B4J1	r-squared is: 0.839		r-squared is: 0.895	
		Recommendations:			
		Reject BOTH lognormal and normal distributions			
		UCL (based on Z-statistic) is	0.8		

DATA	ID	Nitrogen in nitrate 95% UCL Calculation			
0.8	J19YF8/ J19YH6				
0.3	J19YF4				
0.3	J19YF5	Number of samples		Uncensored values	
1.3	J19YF6	Uncensored	12	Mean	1.5
0.5	J19YF7	Censored		Lognormal mean	1.5
1.6	J19YF9	Detection limit or PQL		Std. devn.	1.4
0.3	J19YH0	Method detection limit		Median	0.9
1.0	J1FKL6	TOTAL	12	Min.	0.3
0.5	J19YH2			Max.	5.1
2.5	J19YH3				
0.9	J19YH4				
0.9	J19YH5				
5.1	J1B4H9				
3.1	J1B4J0	Lognormal distribution?		Normal distribution?	
3.2	J1B4J1	r-squared is: 0.966		r-squared is: 0.813	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	3.0		

DATA	ID	Nitrogen in nitrate and nitrite 95% UCL Calculation			
0.7	J19YF8/ J19YH6				
0.6	J19YF4				
0.3	J19YF5	Number of samples		Uncensored values	
1.4	J19YF6	Uncensored	12	Mean	1.5
0.6	J19YF7	Censored		Lognormal mean	1.5
1.3	J19YF9	Detection limit or PQL		Std. devn.	1.2
1.3	J19YH0	Method detection limit		Median	1.0
0.8	J1FKL6	TOTAL	12	Min.	0.3
0.7	J19YH2			Max.	4.8
2.5	J19YH3				
1.0	J19YH4				
1.0	J19YH5				
4.8	J1B4H9				
3.0	J1B4J0	Lognormal distribution?		Normal distribution?	
2.9	J1B4J1	r-squared is: 0.967		r-squared is: 0.812	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	2.4		

DATA	ID	Sulfate 95% UCL Calculation			
5.9	J19YF8/ J19YH6				
2.9	J19YF4				
6.4	J19YF5	Number of samples		Uncensored values	
6.6	J19YF6	Uncensored	12	Mean	6.5
4.3	J19YF7	Censored		Lognormal mean	6.6
14	J19YF9	Detection limit or PQL		Std. devn.	2.8
8.8	J19YH0	Method detection limit		Median	6.4
6.9	J1FKL6	TOTAL	12	Min.	2.9
3.0	J19YH2			Max.	14
7.7	J19YH3				
7.4	J19YH4				
3.8	J19YH5				
6.4	J1B4H9				
5.4	J1B4J0	Lognormal distribution?		Normal distribution?	
8.0	J1B4J1	r-squared is: 0.945		r-squared is: 0.870	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	8.2		

CALCULATION SHEET

Washington Closure Hanford
Originator: J. D. Skoglie
Project: 100-H Field Remediation
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date: 05/17/11
Job No.: 14655

Calc. No.: 0100H-CA-V0164
Checked: T. E. Queen

Rev. No.: 0
Date: 05/17/11
Sheet No.: 40 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Staging Pile Area

Arsenic 95% UCL Calculation

DATA	ID
1.9	J1FKM0/ J1FKM9
2.2	J1FKL7
1.7	J1FKL8
1.5	J1FKL9
7.8	J1FKM1
9.1	J1FKM2
14.1	J1FKM3
6.7	J1FKM4
12.2	J1FKM5
3.4	J1FKM6
2.2	J1FKM7
14.2	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	6.4
Censored		Lognormal mean	6.8
Detection limit or PQL		Std. devn.	5.0
Method detection limit		Median	5.1
TOTAL	12	Min.	1.5
		Max.	14.2

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.871
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.0

Barium 95% UCL Calculation

DATA	ID
34.7	J1FKM0/ J1FKM9
36.4	J1FKL7
33.5	J1FKL8
37.3	J1FKL9
56.8	J1FKM1
60.5	J1FKM2
126	J1FKM3
68.3	J1FKM4
82.9	J1FKM5
40.6	J1FKM6
43.0	J1FKM7
72.5	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	60.4
Censored		Lognormal mean	60.6
Detection limit or PQL		Std. devn.	28.6
Method detection limit		Median	51.8
TOTAL	12	Min.	33.5
		Max.	126

Lognormal distribution? r-squared is: 0.920
Normal distribution? r-squared is: 0.866
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 80.0

Beryllium 95% UCL Calculation

DATA	ID
0.080	J1FKM0/ J1FKM9
0.069	J1FKL7
0.079	J1FKL8
0.069	J1FKL9
0.15	J1FKM1
0.15	J1FKM2
0.17	J1FKM3
0.10	J1FKM4
0.22	J1FKM5
0.047	J1FKM6
0.028	J1FKM7
0.16	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	0.11
Censored		Lognormal mean	0.12
Detection limit or PQL		Std. devn.	0.057
Method detection limit		Median	0.095
TOTAL	12	Min.	0.028
		Max.	0.22

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.958
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.17

Boron 95% UCL Calculation

DATA	ID
0.47	J1FKM0/ J1FKM9
0.88	J1FKL7
0.48	J1FKL8
0.43	J1FKL9
6.9	J1FKM1
2.1	J1FKM2
1.7	J1FKM3
1.2	J1FKM4
1.4	J1FKM5
0.48	J1FKM6
0.42	J1FKM7
1.8	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	1.52
Censored		Lognormal mean	1.48
Detection limit or PQL		Std. devn.	1.80
Method detection limit		Median	1.04
TOTAL	12	Min.	0.42
		Max.	6.90

Lognormal distribution? r-squared is: 0.884
Normal distribution? r-squared is: 0.598
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 2.4

Cadmium 95% UCL Calculation

DATA	ID
0.067	J1FKM0/ J1FKM9
0.043	J1FKL7
0.049	J1FKL8
0.077	J1FKL9
0.15	J1FKM1
0.11	J1FKM2
0.12	J1FKM3
0.10	J1FKM4
0.14	J1FKM5
0.059	J1FKM6
0.077	J1FKM7
0.12	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	0.093
Censored		Lognormal mean	0.094
Detection limit or PQL		Std. devn.	0.036
Method detection limit		Median	0.089
TOTAL	12	Min.	0.043
		Max.	0.15

Lognormal distribution? r-squared is: 0.983
Normal distribution? r-squared is: 0.965
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.12

Chromium 95% UCL Calculation

DATA	ID
9.20	J1FKM0/ J1FKM9
9.20	J1FKL7
9.40	J1FKL8
6.10	J1FKL9
11.0	J1FKM1
9.60	J1FKM2
11.9	J1FKM3
10.5	J1FKM4
13.1	J1FKM5
9.40	J1FKM6
9.40	J1FKM7
11.8	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	10.0
Censored		Lognormal mean	10.1
Detection limit or PQL		Std. devn.	1.78
Method detection limit		Median	9.50
TOTAL	12	Min.	6.10
		Max.	13.1

Lognormal distribution? r-squared is: 0.845
Normal distribution? r-squared is: 0.900
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 11.0

Cobalt 95% UCL Calculation

DATA	ID
5.0	J1FKM0/ J1FKM9
4.9	J1FKL7
5.2	J1FKL8
4.5	J1FKL9
6.3	J1FKM1
6.0	J1FKM2
7.2	J1FKM3
7.2	J1FKM4
7.9	J1FKM5
6.7	J1FKM6
6.8	J1FKM7
6.8	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	6.2
Censored		Lognormal mean	6.2
Detection limit or PQL		Std. devn.	1.1
Method detection limit		Median	6.5
TOTAL	12	Min.	4.5
		Max.	7.9

Lognormal distribution? r-squared is: 0.936
Normal distribution? r-squared is: 0.950
Recommendations.
Use lognormal distribution.

UCL (Land's method) is 6.9

Copper 95% UCL Calculation

DATA	ID
11.9	J1FKM0/ J1FKM9
11.3	J1FKL7
12.1	J1FKL8
12.5	J1FKL9
15.9	J1FKM1
13.5	J1FKM2
15.6	J1FKM3
17.0	J1FKM4
14.9	J1FKM5
14.0	J1FKM6
12.9	J1FKM7
14.0	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	13.8
Censored		Lognormal mean	13.8
Detection limit or PQL		Std. devn.	1.78
Method detection limit		Median	13.8
TOTAL	12	Min.	11.3
		Max.	17.0

Lognormal distribution? r-squared is: 0.983
Normal distribution? r-squared is: 0.975
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.8

Lead 95% UCL Calculation

DATA	ID
2.55	J1FKM0/ J1FKM9
2.00	J1FKL7
2.10	J1FKL8
2.30	J1FKL9
30.7	J1FKM1
35.3	J1FKM2
70.5	J1FKM3
20.0	J1FKM4
32.7	J1FKM5
5.50	J1FKM6
2.30	J1FKM7
58.5	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	22.0
Censored		Lognormal mean	28.5
Detection limit or PQL		Std. devn.	23.9
Method detection limit		Median	12.8
TOTAL	12	Min.	2.00
		Max.	70.5

Lognormal distribution? r-squared is: 0.857
Normal distribution? r-squared is: 0.835
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 33.4

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
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Ecology Software (MTCAStat) Results, 116-H-5 Staging Pile Area

Manganese 95% UCL Calculation

DATA	ID				
224	J1FKM0/ J1FKM9				
218	J1FKL7				
231	J1FKL8	Number of samples		Uncensored values	
182	J1FKL9	Uncensored	12	Mean	256
254	J1FKM1	Censored		Lognormal mean	256
252	J1FKM2	Detection limit or PQL		Std. devn.	48
300	J1FKM3	Method detection limit		Median	247
286	J1FKM4	TOTAL	12	Min.	182
362	J1FKM5			Max.	362
230	J1FKM6				
241	J1FKM7				
294	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.959 r-squared is: 0.931
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 283

Nickel 95% UCL Calculation

DATA	ID				
9.30	J1FKM0/ J1FKM9				
9.40	J1FKL7				
10.5	J1FKL8	Number of samples		Uncensored values	
7.00	J1FKL9	Uncensored	12	Mean	9.92
10.8	J1FKM1	Censored		Lognormal mean	9.93
9.50	J1FKM2	Detection limit or PQL		Std. devn.	1.50
11.2	J1FKM3	Method detection limit		Median	9.95
9.70	J1FKM4	TOTAL	12	Min.	7.00
12.8	J1FKM5			Max.	12.8
10.2	J1FKM6				
8.00	J1FKM7				
10.6	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.934 r-squared is: 0.954
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 10.8

Vanadium 95% UCL Calculation

DATA	ID				
36.9	J1FKM0/ J1FKM9				
36.8	J1FKL7				
38.4	J1FKL8	Number of samples		Uncensored values	
36.4	J1FKL9	Uncensored	12	Mean	43.8
41.1	J1FKM1	Censored		Lognormal mean	43.8
38.1	J1FKM2	Detection limit or PQL		Std. devn.	7.53
46.4	J1FKM3	Method detection limit		Median	43.3
59.2	J1FKM4	TOTAL	12	Min.	36.1
45.4	J1FKM5			Max.	59.2
49.8	J1FKM6				
53.3	J1FKM7				
45.8	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.922 r-squared is: 0.907
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 48.0

Zinc 95% UCL Calculation

DATA	ID				
28.3	J1FKM0/ J1FKM9				
28.4	J1FKL7				
27.9	J1FKL8	Number of samples		Uncensored values	
25.7	J1FKL9	Uncensored	12	Mean	36.0
40.6	J1FKM1	Censored		Lognormal mean	38.1
38.4	J1FKM2	Detection limit or PQL		Std. devn.	8.15
44.8	J1FKM3	Method detection limit		Median	34.7
44.6	J1FKM4	TOTAL	12	Min.	25.7
48.6	J1FKM5			Max.	48.6
32.8	J1FKM6				
32.9	J1FKM7				
43.5	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.935 r-squared is: 0.934
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 41.1

Benzo(a)anthracene 95% UCL Calculation

DATA	ID				
200	J1FKM0/ J1FKM9				
17	J1FKL7				
1.7	J1FKL8	Number of samples		Uncensored values	
25	J1FKL9	Uncensored	12	Mean	31
19	J1FKM1	Censored		Lognormal mean	40
21	J1FKM2	Detection limit or PQL		Std. devn.	55
22	J1FKM3	Method detection limit		Median	20
31	J1FKM4	TOTAL	12	Min.	1.6
8.9	J1FKM5			Max.	200
1.6	J1FKM6				
1.8	J1FKM7				
44	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.890 r-squared is: 0.520
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 58

Benzo(a)pyrene 95% UCL Calculation

DATA	ID				
145	J1FKM0/ J1FKM9				
3.3	J1FKL7				
8.8	J1FKL8	Number of samples		Uncensored values	
17	J1FKL9	Uncensored	12	Mean	27
22	J1FKM1	Censored		Lognormal mean	28
27	J1FKM2	Detection limit or PQL		Std. devn.	39
37	J1FKM3	Method detection limit		Median	20
25	J1FKM4	TOTAL	12	Min.	3.2
10	J1FKM5			Max.	145
3.2	J1FKM6				
3.3	J1FKM7				
27	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.927 r-squared is: 0.567
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 88.5

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID				
165	J1FKM0/ J1FKM9				
2.2	J1FKL7				
2.2	J1FKL8	Number of samples		Uncensored values	
20	J1FKL9	Uncensored	12	Mean	27
25	J1FKM1	Censored		Lognormal mean	30
20	J1FKM2	Detection limit or PQL		Std. devn.	45
20	J1FKM3	Method detection limit		Median	20
21	J1FKM4	TOTAL	12	Min.	2.1
2.3	J1FKM5			Max.	165
2.1	J1FKM6				
2.2	J1FKM7				
37	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.842 r-squared is: 0.519
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 48

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID				
78	J1FKM0/ J1FKM9				
2.1	J1FKL7				
2.1	J1FKL8	Number of samples		Uncensored values	
11	J1FKL9	Uncensored	12	Mean	13
9.8	J1FKM1	Censored		Lognormal mean	12
10	J1FKM2	Detection limit or PQL		Std. devn.	21
8.9	J1FKM3	Method detection limit		Median	9.3
9.7	J1FKM4	TOTAL	12	Min.	1.9
2.2	J1FKM5			Max.	78
1.9	J1FKM6				
2.0	J1FKM7				
14	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.835 r-squared is: 0.477
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 23

Chrysene 95% UCL Calculation

DATA	ID				
150	J1FKM0/ J1FKM9				
2.5	J1FKL7				
2.5	J1FKL8	Number of samples		Uncensored values	
27	J1FKL9	Uncensored	12	Mean	28
21	J1FKM1	Censored		Lognormal mean	32
24	J1FKM2	Detection limit or PQL		Std. devn.	40
26	J1FKM3	Method detection limit		Median	23
29	J1FKM4	TOTAL	12	Min.	2.4
8.7	J1FKM5			Max.	150
2.4	J1FKM6				
2.5	J1FKM7				
36	J1FKM8				

Lognormal distribution? Normal distribution?
r-squared is: 0.877 r-squared is: 0.568
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 47

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	Date	05/17/11	Calc. No.	0100H-CA-V0164
Project	100-H Field Remediation	Job No.	14655	Checked	T. E. Queen
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations	Rev. No.	0	Date	05/17/11
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Ecology Software (MTCAStat) Results, 116-H-5 Staging Pile Area

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
115	J1FKM0/ J1FKM9
6.0	J1FKL7
6.0	J1FKL8
12	J1FKL9
16	J1FKM1
21	J1FKM2
17	J1FKM3
20	J1FKM4
6.5	J1FKM5
6.0	J1FKM6
6.0	J1FKM7
27	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	22
Censored		Lognormal mean	20
Detection limit or PQL		Std. devn.	30
Method detection limit		Median	14
TOTAL	12	Min.	6.0
		Max.	115

Lognormal distribution? r-squared is: 0.837
Normal distribution? r-squared is: 0.506
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 36

Phenanthrene 95% UCL Calculation

DATA	ID
185	J1FKM0/ J1FKM9
6.0	J1FKL7
6.0	J1FKL8
13	J1FKL9
6.0	J1FKM1
19	J1FKM2
17	J1FKM3
32	J1FKM4
6.5	J1FKM5
6.0	J1FKM6
6.0	J1FKM7
14	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	26
Censored		Lognormal mean	21
Detection limit or PQL		Std. devn.	51
Method detection limit		Median	10
TOTAL	12	Min.	6.0
		Max.	185

Lognormal distribution? r-squared is: 0.755
Normal distribution? r-squared is: 0.419
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 50

Pyrene 95% UCL Calculation

DATA	ID
350	J1FKM0/ J1FKM9
6.0	J1FKL7
6.0	J1FKL8
54	J1FKL9
30	J1FKM1
51	J1FKM2
54	J1FKM3
70	J1FKM4
21	J1FKM5
6.0	J1FKM6
6.0	J1FKM7
65	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	60
Censored		Lognormal mean	65
Detection limit or PQL		Std. devn.	95
Method detection limit		Median	41
TOTAL	12	Min.	6.0
		Max.	350

Lognormal distribution? r-squared is: 0.886
Normal distribution? r-squared is: 0.631
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 105

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
110	J1FKM0/ J1FKM9
110	J1FKL7
110	J1FKL8
100	J1FKL9
130	J1FKM1
130	J1FKM2
120	J1FKM3
120	J1FKM4
120	J1FKM5
110	J1FKM6
110	J1FKM7
130	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	117
Censored		Lognormal mean	117
Detection limit or PQL		Std. devn.	10
Method detection limit		Median	115
TOTAL	12	Min.	100
		Max.	130

Lognormal distribution? r-squared is: 0.889
Normal distribution? r-squared is: 0.887
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 121

Fluoride 95% UCL Calculation

DATA	ID
0.41	J1FKM0/ J1FKM9
0.42	J1FKL7
0.41	J1FKL8
0.43	J1FKL9
0.43	J1FKM1
0.95	J1FKM2
1.1	J1FKM3
1.6	J1FKM4
0.96	J1FKM5
0.88	J1FKM6
1.1	J1FKM7
0.97	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	0.82
Censored		Lognormal mean	0.83
Detection limit or PQL		Std. devn.	0.42
Method detection limit		Median	0.92
TOTAL	12	Min.	0.41
		Max.	1.60

Lognormal distribution? r-squared is: 0.850
Normal distribution? r-squared is: 0.835
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.0

Nitrogen in nitrate 95% UCL Calculation

DATA	ID
0.42	J1FKM0/ J1FKM9
0.35	J1FKL7
0.36	J1FKL8
0.36	J1FKL9
40.1	J1FKM1
44.8	J1FKM2
0.61	J1FKM3
0.94	J1FKM4
0.55	J1FKM5
0.41	J1FKM6
1.1	J1FKM7
0.76	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	7.6
Censored		Lognormal mean	5.1
Detection limit or PQL		Std. devn.	16
Method detection limit		Median	0.6
TOTAL	12	Min.	0.4
		Max.	45

Lognormal distribution? r-squared is: 0.857
Normal distribution? r-squared is: 0.48
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 15.3

Nitrogen in nitrate and nitrite 95% UCL Calculation

DATA	ID
0.18	J1FKM0/ J1FKM9
0.18	J1FKL7
0.19	J1FKL8
0.19	J1FKL9
39.9	J1FKM1
50.9	J1FKM2
0.43	J1FKM3
0.85	J1FKM4
0.46	J1FKM5
0.18	J1FKM6
1.1	J1FKM7
0.62	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	7.9
Censored		Lognormal mean	5.8
Detection limit or PQL		Std. devn.	18
Method detection limit		Median	0.4
TOTAL	12	Min.	0.2
		Max.	51

Lognormal distribution? r-squared is: 0.732
Normal distribution? r-squared is: 0.487
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 16

Sulfate 95% UCL Calculation

DATA	ID
1.8	J1FKM0/ J1FKM9
2.1	J1FKL7
0.85	J1FKL8
2.0	J1FKL9
43.6	J1FKM1
18.2	J1FKM2
2.0	J1FKM3
55.6	J1FKM4
2.8	J1FKM5
5.4	J1FKM6
9.1	J1FKM7
3.3	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	12.2
Censored		Lognormal mean	12.3
Detection limit or PQL		Std. devn.	18.3
Method detection limit		Median	3.05
TOTAL	12	Min.	0.85
		Max.	55.6

Lognormal distribution? r-squared is: 0.906
Normal distribution? r-squared is: 0.652
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 51.6

TPH - diesel range 95% UCL Calculation

DATA	ID
4550	J1FKM0/ J1FKM9
345	J1FKL7
320	J1FKL8
345	J1FKL9
11000	J1FKM1
8500	J1FKM2
9500	J1FKM3
7100	J1FKM4
4400	J1FKM5
820	J1FKM6
345	J1FKM7
4000	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	4269
Censored		Lognormal mean	6158
Detection limit or PQL		Std. devn.	3959
Method detection limit		Median	4200
TOTAL	12	Min.	320
		Max.	11000

Lognormal distribution? r-squared is: 0.841
Normal distribution? r-squared is: 0.891
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 6149

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
Sheet No. 43 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Overburden

1	DATA	ID	TPH-diesel range EXT 95% UCL Calculation				DATA	ID	TPH-motor oil (high boiling) 95% UCL Calculation			
2	10350	J1FKM0/ J1FKM9					52850	J19YJ4/ J19YJ9				
3	500	J1FKL7					184000	J19YH7				
4	470	J1FKL8	Number of samples		Uncensored values		17400	J19YH8	Number of samples		Uncensored values	
5	500	J1FKL9	Uncensored	12	Mean	12410	10400	J19YH9	Uncensored	12	Mean	54368
6	41000	J1FKM1	Censored		Lognormal mean	21532	8660	J19YJ0	Censored		Lognormal mean	58228
7	30000	J1FKM2	Detection limit or PQL		Std. devn.	14620	14900	J19YJ1	Detection limit or PQL		Std. devn.	55168
8	35000	J1FKM3	Method detection limit		Median	8250	141000	J19YJ2	Method detection limit		Median	45975
9	12000	J1FKM4	TOTAL	12	Min.	470	10500	J19YJ3	TOTAL	12	Min.	8660
10	7700	J1FKM5			Max.	41000	60800	J19YJ5			Max.	184000
11	2100	J1FKM6					58900	J19YJ6				
12	500	J1FKM7					39100	J19YJ7				
13	8800	J1FKM8					53900	J19YJ8				
14												
15			Lognormal distribution?		Normal distribution?				Lognormal distribution?		Normal distribution?	
16			r-squared is: 0.880		r-squared is: 0.807				r-squared is: 0.937		r-squared is: 0.782	
17			Recommendations:						Recommendations:			
18			Reject BOTH lognormal and normal distributions						Use lognormal distribution.			
19												
20			UCL (based on Z-statistic) is		19353				UCL (Land's method) is		147061	
21												

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0		
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11		
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 44 of 47		

Duplicate Analysis - 116-H-5 Waste Site Shallow Zone

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Uranium-233/234			Uranium-238			Aluminum			Arsenic		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	14.6		0.54	0.683		0.148	1.17		0.266	0.977		0.102	1.17		0.266	0.770		0.226	0.681		0.226	8400		18.1	4.27		0.907
Duplicate of J19YB9	J19YD0	5/18/10	13.0		0.676	0.670		0.154	1.09		0.371	0.965		0.097	1.09		0.371	0.930		0.178	0.768		0.178	7600		13.9	3.99		0.695

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA	Uranium-233/234	Uranium-238	Aluminum	Arsenic
TDL		0.5	0.1	0.2	1	1	1	1	5	10
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	11.6%	1.9%	7.1%					10.0%	
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Barium			Beryllium			Boron			Calcium			Chromium			Cobalt			Copper			Iron			Lead		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	67.8		0.453	0.263		0.181	1.22	B	1.81	4240		18.1	21.2		0.907	6.33		2.72	12.5		1.81	21700		18.1	4.66		0.907
Duplicate of J19YB9	J19YD0	5/18/10	60.1		0.348	0.232		0.139	1.11	B	1.39	4040		13.9	15.9		0.695	5.42		2.09	11.4		1.39	18700		13.9	5.41		0.695

Analysis:

		Barium	Beryllium	Boron	Calcium	Chromium	Cobalt	Copper	Iron	Lead
TDL		2	0.2	2	100	1	2	1	5	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	12.0%			4.8%	28.6%		9.2%	14.9%	
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	4670		4.53	278		0.907	0.294	B	0.907	15.6		2.27	1200		90.7	571		5.44	165		45.3	52.6		0.91	37.8		2.72
Duplicate of J19YB9	J19YD0	5/18/10	4110		3.48	256		0.695	0.243	B	0.695	12.2		1.74	1100		69.5	512		4.17	147		34.8	43.7		0.70	33.9		2.09

Analysis:

		Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon	Sodium	Vanadium	Zinc
TDL		75	5	2	4	400	2	50	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	12.8%	8.2%				10.9%		18.5%	10.9%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(b)fluoranthene (Method 8310)			Phenanthrene (Method 8310)			Fluoride			Nitrogen in nitrate *			Nitrogen in nitrate and nitrite			Phosphorous in phosphate			Sulfate		
			ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	1.16	J	3.87	1.16	J	3.87	0.7	B	2.8	0.59	JB	0.63	0.49		0.22	1.3	J	0.9	2.6	B	2.8
Duplicate of J19YB9	J19YD0	5/18/10	1.54	J	3.43	1.20	J	3.43	0.8	B	2.5	0.84		0.56	0.62		0.19	4.2		2.5	3.2		2.5

Analysis:

		Benzo(b)fluoranthene (Method 8310)	Phenanthrene (Method 8310)	Fluoride	Nitrogen in nitrate *	Nitrogen in nitrate and nitrite	Phosphorous in phosphate	Sulfate
TDL		15	15	5	0.75	0.75	5	5
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?					No-Stop (acceptable)	No-Stop (acceptable)	
	RPD							
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 45 of 47

Duplicate Analysis - 116-H-5 Waste Site Deep Zone

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Uranium-233/234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/10	15.1		0.78	0.502		0.135	0.800		0.302	0.668		0.086	0.800		0.302	0.766		0.279	0.620		0.279
Duplicate of J19YD1	J19YF3	5/18/10	15.1		0.852	0.576		0.128	0.539		0.333	0.731		0.086	0.539		0.333	0.567		0.181	0.543		0.181

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA	Uranium-233/234	Uranium-238
TDL		0.5	0.1	0.2	1	1	1	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	0.0%	13.7%					
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Copper		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	6430		1.4	6.0		0.60	43.4		0.069	0.12	B	0.030	0.14	B	0.037	5170		12.9	12.8		0.053	5.3	X	0.091	18.5		0.20
Duplicate of J1HH85[a]	J1HH86	4/13/11	6810		1.5	6.7		0.64	42.1		0.074	0.13	B	0.032	0.19		0.040	4840		13.7	15.1		0.056	5.4	X	0.097	16.2		0.21

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper
TDL		5	10	2	0.2	0.2	100	1	2	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)
	RPD	5.7%		3.0%			6.6%	16.5%		13.3%
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Nickel			Potassium			Silicon			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	14500		3.5	14.3	X	0.25	3940		3.4	221		0.091	0.019		0.0050	9.9	X	0.11	843		37.5	192		5.2	244		53.9
Duplicate of J1HH85[a]	J1HH86	4/13/11	15100		3.7	17.3	X	0.26	4280		3.6	228		0.097	0.020		0.0050	11.3	X	0.12	891		39.9	219		5.5	238		57.4

Analysis:

		Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silicon	Sodium
TDL		5	5	75	5	0.2	4	400	2	50
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	4.1%		8.3%	3.1%				13.1%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Vanadium			Zinc			Bis(2-ethylhexyl)phthalate			Fluoride			Nitrogen in nitrate[a]			Nitrogen in nitrate and nitrite			Phosporous in phosphate			Sulfate			TPH - motor oil (high boiling)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	35.9		0.086	60.8		0.36	69	JB	47																		
Duplicate of J1HH85[a]	J1HH86	4/13/11	37.1		0.091	77.2		0.39	83	JB	47																		
DZ-1	J19YD1	5/18/10										0.9	B	2.3	2.78	J	0.52	1.7		0.21	2.5	J	2.3	7.8		2.3	5670	J	10200
Duplicate of J19YD1	J19YF3	5/18/10										1.2	B	2.4	2.64		0.54	1.62		0.22	3.2		2.4	8.4		2.4	3480	J	10400

Analysis:

		Vanadium	Zinc	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in nitrate	Nitrogen in nitrate and nitrite	Phosporous in phosphate	Sulfate	TPH - motor oil (high boiling)
TDL		2.5	1	660	5	0.75	0.75	5	5	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	
	RPD	3.3%	23.8%							
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator: J. D. Skoglie	Date: 05/17/11	Calc. No. 0100H-CA-V0164	Rev. No. 0
Project: 100-H Field Remediation	Job No. 14655	Checked: T. E. Queen	Date: 05/17/11
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 46 of 47

Duplicate Analysis - 116-H-5 Waste Site Overburden

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Uranium-233/234			Uranium-238			Aluminum			Antimony		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	12.8		0.766	0.410		0.170	0.619		0.346	0.706		0.118	0.619		0.346	0.517		0.172	0.427		0.172	6390		16.3	0.344	B	0.813
Duplicate of J19YF8	J19YH6	5/13/10	14.6		1.16	0.488		0.175	1.00		0.326	0,944		0.135	1 00		0.326	0.579		0.201	0.526		0.201	6090		19.0	0.388	B	0.951

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA	Uranium-233/234	Uranium-238	Aluminum	Antimony
TDL		0.5	0.1	0.2	1	1	1	1	5	0.8
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	
	RPD	12.4%							4.8%	
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Calcium			Chromium			Cobalt			Copper			Iron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	4.95		0.813	51.4		0.407	0.162	B	0.163	0.938	B	1.63	4560		16.3	10.4		0.813	5.41		2.44	12.7		1.63	16200		16.3
Duplicate of J19YF8	J19YH6	5/13/10	4.74		0.951	47.2		0.478	0.149	B	0.190	0.842	B	1.90	4040		19.0	10.1		0.951	5.16		2.85	12.7		1.90	15800		19 0

Analysis:

		Arsenic	Barium	Beryllium	Boron	Calcium	Chromium	Cobalt	Copper	Iron
TDL		10	2	0.2	2	100	1	2	1	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)			Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD		8.5%			12.1%	2.9%		0.0%	2.5%
	Difference > 2 TDL?	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Lead			Magnesium			Manganese			Nickel			Potassium			Silicon			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	13.1		0.813	4170		4.07	250		0.813	11.1		2.03	819		81.3	172		4.88	190		40.7	42.5		0.813	32.2		2.44
Duplicate of J19YF8	J19YH6	5/13/10	13.0		0.951	4130		4.76	239		0.951	10.6		2.38	742		95.1	198		5.71	190		47.6	39.5		0.951	31.2		2.85

Analysis:

		Lead	Magnesium	Manganese	Nickel	Potassium	Silicon	Sodium	Vanadium	Zinc
TDL		5	75	5	4	400	2	50	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD		1.0%	4.5%			13.0%		7.3%	3.2%
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(a)anthracene (Method 8310)			Benzo(a)pyrene (Method 8310)			Benzo(b)fluoranthene (Method 8310)			Benzo(ghi)perylene (Method 8310)			Benzo(k)fluoranthene (Method 8310)			Chrysene (Method 8310)			Fluoranthene (Method 8310)			Indeno(1,2,3-cd)pyrene (Method 8310)			Phenanthrene (Method 8310)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
OB-5	J19YF8	5/13/10	5.88		3.25	7.38		3.25	8.77		3.25	4.89		3.25	3.72		3.25	3.77		3.25	21		3.25	5.72		3.25	6.78		3.25
Duplicate of J19YF8	J19YH6	5/13/10	4.07		3.25	4.25		3.25	7.52		3.25	3.03	J	3.25	2.31	J	3.25	1.17	J	3.25	9.18		3.25	4.02		3.25	3.08	J	3.25

Analysis:

		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene
TDL		15	15	15	15	15	15	15	15	15
Duplicate Analyses	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)				No-Stop (acceptable)	No-Stop (acceptable)	
	RPD									
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Pyrene (Method 8310)			Fluoride			Nitrogen in nitrate *			Nitrogen in nitrate and nitrite			Sulfate		
			ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	17.2		3.25	0.8	B	2.5	0.70		0.56	0.66		0.20	5.6		2.5
Duplicate of	J19YH6	5/13/10	7 13		3.25	0.5	B	2 5	0 81		0.56	0.75		0.20	6 2		2 5

Analysis:

		Pyrene	Fluoride	Nitrogen in nitrate	Nitrogen in nitrate and nitrite	Sulfate
TDL		15	5	0.75	0.75	5
Duplicate Analysis	Both > PQL?	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD					
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0184 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 47 of 47

Duplicate Analysis - 116-H-5 Waste Site Staging Pile Area

Sampling Area	Sample Number	Sample Date	Potassium-40 pCi/g	Q	MDA	Radium-226 pCi/g	Q	MDA	Radium-228 pCi/g	Q	MDA	Thorium-228 GEA pCi/g	Q	MDA	Thorium-232 GEA pCi/g	Q	MDA
SPA-6	J19YJ4	5/17/10	17.3		0.628	0.506		0.140	0.500		0.255	0.573		0.079	0.500		0.255
Duplicate of J19YJ4	J19YJ8	5/17/10	15.7		0.301	0.587		0.057	0.825		0.137	0.831		0.036	0.829		0.137

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA
TDL		0.5	0.1	0.2	1	1
Duplicate Analysis	Both > PQL?	Yes (continue)		Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	24.3%	11.4%			
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Aluminum mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	5420	X	1.4	1.7		0.58	32.9	X	0.067	0.065	B	0.029	0.054	B	0.036
Duplicate of J1FKM0*	J1FKM8	3/17/11	5260	X	1.6	2.1		0.68	38.4	X	0.079	0.074	B	0.034	0.079	B	0.043

Sampling Area	HEIS Number	Sample Date	Calcium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Iron mg/kg	Q	PQL	Lead mg/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	5790	X	12.4	8.8	X	0.051	4.9	X	0.088	12.3		0.19	12900	X	3.3	2.7	X	0.24
Duplicate of J1FKM0*	J1FKM8	3/17/11	5660	X	14.7	9.6	X	0.060	5.1	X	0.10	11.4		0.23	13100	X	4.0	2.4	X	0.28

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
TDL		5	10	2	0.2	0.2	100	1	2	1	5	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	3.0%		10.1%			2.3%	8.7%		7.6%	1.5%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Magnesium mg/kg	Q	PQL	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Potassium mg/kg	Q	PQL	Silicon mg/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	3760	X	3.3	222	X	0.088	8.3	X	0.11	601		36.1	164	N	5.0
Duplicate of J1FKM0*	J1FKM8	3/17/11	4040	X	3.8	225	X	0.10	10.3	X	0.13	689		42.8	195	N	5.9

Sampling Area	HEIS Number	Sample Date	Sodium mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	Anthracene (Method 8310) ug/kg	Q	PQL	Benzo(a)anthracene (Method 8310) ug/kg	Q	PQL	Benzo(a)pyrene (Method 8310) ug/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	185		52.0	35.8		0.083	28.4	X	0.35	87		3.0	230		3.1	170		6.2
Duplicate of J1FKM0*	J1FKM8	3/17/11	203		61.4	38.0		0.098	28.1	X	0.41	48		2.9	170		3.1	120		6.2

Analysis:

		Magnesium	Manganese	Nickel	Potassium	Silicon	Sodium	Vanadium	Zinc	Anthracene (Method 8310)	Benzo(a)anthracene (Method 8310)	Benzo(a)pyrene (Method 8310)
TDL		75	5	4	400	2	50	2.5	1	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	7.2%	1.3%			17.3%		6.0%	1.1%		30.0%	34.3%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	Yes - assess further	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(b)fluoranthene (Method 8310) ug/kg	Q	PQL	Benzo(ghi)perylene (Method 8310) ug/kg	Q	PQL	Benzo(k)fluoranthene (Method 8310) ug/kg	Q	PQL	Chrysene (Method 8310) ug/kg	Q	PQL	Dibenz[a,h]anthracene (Method 8310) ug/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	190		4.1	96		7.0	87		3.8	160		4.7	26	JX	11
Duplicate of J1FKM0*	J1FKM9	3/17/11	140		4.0	36	X	6.9	69		3.8	140		4.6	19	JX	11

Sampling Area	HEIS Number	Sample Date	Fluoranthene (Method 8310) ug/kg	Q	PQL	Fluorene (Method 8310) ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene (Method 8310) ug/kg	Q	PQL	Phenanthrene (Method 8310) ug/kg	Q	PQL	Pyrene (Method 8310) ug/kg	Q	PQL	Benzo(a)anthracene (Method 8270) ug/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	400		13	57		5.1	120		12	240		12	400		12	71	J	20
Duplicate of J1FKM0*	J1FKM9	3/17/11	290		12	31		5.1	110		12	130		12	300		12	130	J	20

Analysis:

		Benzo(b)fluoranthene (Method 8310)	Benzo(ghi)perylene (Method 8310)	Benzo(k)fluoranthene (Method 8310)	Chrysene (Method 8310)	Dibenz[a,h]anthracene (Method 8310)	Fluoranthene (Method 8310)	Fluorene (Method 8310)	Indeno(1,2,3-cd)pyrene (Method 8310)	Phenanthrene (Method 8310)	Pyrene (Method 8310)	Benzo(a)anthracene (Method 8270)
TDL		15	15	15	15	15	15	15	15	15	15	660
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	30.3%			13.3%		31.9%		8.7%	59.5%	28.6%	
	Difference > 2 TDL?	Not applicable	Yes - assess further	No - acceptable	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(a)pyrene (Method 8270) ug/kg	Q	PQL	Benzo(b)fluoranthene (Method 8270) ug/kg	Q	PQL	Benzo(ghi)perylene (Method 8270) ug/kg	Q	PQL	Bis (2-ethylhexyl)phthalate ug/kg	Q	PQL	Chrysene (Method 8270) ug/kg	Q	PQL	Fluoranthene (Method 8270) ug/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	110	J	20	120	JX	26	41	J	16	110	JB	46	66	J	27	120	J	36
Duplicate of J1FKM0*	J1FKM8	3/17/11	150	J	20	210	JX	26	68	J	16	110	JB	46	120	J	27	210	J	36

Sampling Area	HEIS Number	Sample Date	Indeno(1,2,3-cd)pyrene (Method 8270) ug/kg	Q	PQL	Phenanthrene (Method 8270) ug/kg	Q	PQL	Pyrene (Method 8270) ug/kg	Q	PQL	Nitrogen in nitrate * mg/kg	Q	PQL	Sulfate mg/kg	Q	PQL	TPH-diesel range ug/kg	Q	PQL
SPA-4 re-sample 1*	J1FKM0	3/17/11	83	J	72	44	J	17	110	J	12	0.43	B	0.31	1.7	B	1.7	6900		690
Duplicate of J1FKM0*	J1FKM8	3/17/11	110	J	22	62	J	17	180	J	12	0.41	B	0.32	1.9	B	1.8	2200	J	690

Analysis:

		Benzo(a)pyrene (Method 8270)	Benzo(b)fluoranthene (Method 8270)	Benzo(ghi)perylene (Method 8270)	Bis (2-ethylhexyl)phthalate	Chrysene (Method 8270)	Fluoranthene (Method 8270)	Indeno(1,2,3-cd)pyrene (Method 8270)	Phenanthrene (Method 8270)	Pyrene (Method 8270)	Nitrogen in nitrate *	Sulfate	TPH-diesel range
TDL		660	660	660	660	660	660	660	660	660	0.75	5	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)		No-Stop (acceptable)
	RPD												
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	TPH-motor oil (high boiling) ug/kg	Q	PQL	TPH diesel range EXT ug/kg	Q	PQL
SPA-6	J19YJ4	5/17/10	40600		10100			
Duplicate of J19YJ4	J19YJ8	5/17/10	64900		10100			
SPA-4 re-sample 1*	J1FKM0	3/17/11				15000		1000
Duplicate of J1FKM0*	J1FKM9	3/17/11				5700		1000

Analysis:

		TPH-motor oil (high boiling)	TPH diesel range EXT
TDL		5000	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)
	RPD	45.6%	
	Difference > 2 TDL?	Not applicable	No - acceptable

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	8400		18.1	0.907	UJ	0.907	4.27		0.907	67.8		0.453	0.263		0.181
Duplicate of J19YB9	J19YD0	5/18/10	7600		13.9	0.695	U	0.695	3.99		0.695	60.1		0.348	0.232		0.139
SZ-1	J19YB8	5/18/10	5270		14.8	0.742	UJ	0.742	2.13		0.742	33.6		0.371	0.130	B	0.148
SZ-3	J19YC0	5/18/10	7400		16.0	0.801	UJ	0.801	2.83		0.801	69.8		0.401	0.208		0.160
SZ-4	J19YC1	5/18/10	6340		18.0	0.902	UJ	0.902	5.32		0.902	51.9		0.451	0.172	B	0.180
SZ-5	J19YC2	5/18/10	6480		15.3	0.767	UJ	0.767	6.45		0.767	46.7		0.383	0.192		0.153
SZ-6	J19YC3	5/18/10	7240		16.7	0.837	UJ	0.837	3.75		0.837	63.4		0.418	0.216		0.167
SZ-7	J19YC4	5/18/10	7110		19.4	0.378	UJ	0.378	6.58		0.378	52.0		0.486	0.193	B	0.194
SZ-8	J19YC5	5/18/10	7120		15.1	0.28	UJ	0.753	4.84		0.753	62.2		0.377	0.206		0.151
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	6940		1.5	0.36	U	0.36	4.8		0.63	69.6		0.073	0.11	BM	0.032
SZ-10	J19YC7	5/18/10	6700		13.6	0.678	UJ	0.678	7.65		0.678	54.8		33.9	0.181		0.136
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	3790		1.4	0.33	U	0.33	1.1		0.58	43.0		0.066	0.029	U	0.029
SZ-12	J19YC9	5/18/10	6190		17.2	0.859	U	0.859	3.06		0.859	50.7		0.430	0.155	B	0.172
DZ-8 re-sample 2[a]	J1HH85	4/13/11	6430		1.4	0.35	U	0.35	6.0		0.60	43.4		0.069	0.12	B	0.030
Duplicate of J1HH85[a]	J1HH86	4/13/11	6810		1.5	0.37	U	0.37	6.7		0.64	42.1		0.074	0.13	B	0.032
DZ-1 re-sample 2[a]	J1HH80	4/13/11	6390		1.5	0.37	U	0.37	7.0		0.65	60.9		0.074	0.13	B	0.032
DZ-2 re-sample 2[a]	J1HH81	4/13/11	5580		1.4	0.35	U	0.35	2.5		0.61	57.7		0.070	0.063	B	0.031
DZ-3 re-sample 2[a]	J1HH82	4/13/11	6100		1.5	0.37	U	0.37	1.9		0.64	59.7		0.074	0.042	B	0.032
DZ-4 re-sample 2[a]	J1HH83	4/13/11	7380		1.5	0.36	U	0.36	4.8		0.63	68.3		0.073	0.16	B	0.032
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	5290		1.5	0.36	U	0.36	9.8		0.63	35.5		0.072	0.031	U	0.031
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	6310		1.4	0.34	U	0.34	1.8		0.59	50.3		0.068	0.030	U	0.030
DZ-7 re-sample 2[a]	J1HH84	4/13/11	5230		1.6	0.39	U	0.39	4.2		0.69	34.7		0.079	0.098	B	0.034
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	5210		1.5	0.36	U	0.36	1.1		0.62	77.1		0.072	0.031	U	0.031
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	5910		1.5	0.38	U	0.38	2.4		0.65	57.4		0.075	0.033	U	0.033
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	8980		1.6	0.39	U	0.39	2.8		0.67	69.0		0.077	0.074	B	0.034
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	6950		1.6	0.39	U	0.39	3.2		0.68	90.3		0.078	0.034	U	0.034

Footnotes apply to all calculations sheets and attachment 1.

[a] Location re-sampled due to RAG exceedance. All replaced data is shown in attachment 1 and is for information only. Re-sample strategy is further explained in the RSVP.

[b] Nitrate, nitrite, and phosphate were converted to nitrogen in nitrate, nitrogen in nitrite, and phosphorus in phosphate respectively.

Note: Data qualified with B, C, and/or J are considered acceptable values.

B = blank contamination (inorganic constituents)
C = </= 5x blank concentration
D = dilution
HEIS = Hanford Environmental Information System
J = estimate
M = duplicate precision not met.
N = recovery outside control limits
PQL = practical quantitation limit
Q = qualifier
R = rejected
U = undetected
X = >40% difference between primary and confirmation detector results.

Attachment	1	Sheet No.	1 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	1.22	B	1.81	0.227	U	0.227	4240		18.1	21.2		0.907	6.33		2.72
Duplicate of J19YB9	J19YD0	5/18/10	1.11	B	1.39	0.073	B	0.174	4040		13.9	15.9		0.695	5.42		2.09
SZ-1	J19YB8	5/18/10	0.759	B	1.48	0.041	B	0.186	6370		14.8	8.93		0.742	4.91		2.23
SZ-3	J19YC0	5/18/10	3.44		1.60	0.086	B	0.200	4940		16.0	12.7		0.801	5.79		2.40
SZ-4	J19YC1	5/18/10	1.26	B	1.80	0.065	B	0.225	5770		18.0	10.4		0.902	6.11		2.71
SZ-5	J19YC2	5/18/10	1.12	B	1.53	0.060	B	0.192	5310		15.3	11.0		0.767	5.45		2.30
SZ-6	J19YC3	5/18/10	1.26	B	1.67	0.059	B	0.209	5040		16.7	12.8		0.837	6.41		2.51
SZ-7	J19YC4	5/18/10	1.18	B	1.94	0.052	B	0.243	5590		19.4	11.7		0.971	5.82		2.91
SZ-8	J19YC5	5/18/10	1.34	B	1.51	0.101	B	0.188	4280		15.1	12.6		0.753	5.65		2.26
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	1.0	B	0.94	0.074	BM	0.039	5790		13.5	9.9	X	0.055	6.6	X	0.095
SZ-10	J19YC7	5/18/10	0.967	B	1.36	0.059	B	0.170	5340		13.6	10.2		0.678	5.6		2.04
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.86	U	0.86	0.070	B	0.036	4550		12.3	5.3	X	0.051	7.6	X	0.087
SZ-12	J19YC9	5/18/10	1.0	B	1.72	0.105	B	0.215	6020		17.2	13.1		0.859	5.38		2.58
DZ-8 re-sample 2[a]	J1HH85	4/13/11	0.90	U	0.90	0.14	B	0.037	5170		12.9	12.8		0.053	5.3	X	0.091
Duplicate of J1HH85[a]	J1HH86	4/13/11	0.95	U	0.95	0.19		0.040	4840		13.7	15.1		0.056	5.4	X	0.097
DZ-1 re-sample 2[a]	J1HH80	4/13/11	1.2	B	0.96	0.067	B	0.040	7110		13.8	9.8		0.057	6.2	X	0.098
DZ-2 re-sample 2[a]	J1HH81	4/13/11	0.91	U	0.91	0.046	B	0.038	3970		13.0	6.2		0.054	6.4	X	0.093
DZ-3 re-sample 2[a]	J1HH82	4/13/11	0.96	U	0.96	0.042	B	0.040	4730		13.8	15.1		0.057	6.6	X	0.098
DZ-4 re-sample 2[a]	J1HH83	4/13/11	0.94	U	0.94	0.081	B	0.039	5650		13.5	12.9		0.056	6.3	X	0.096
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	0.93	U	0.93	0.039	U	0.039	4840		13.4	7.6		0.055	5.1	X	0.095
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	0.88	U	0.88	0.052	B	0.037	4910		12.6	7.2		0.052	5.5	X	0.090
DZ-7 re-sample 2[a]	J1HH84	4/13/11	1.0	U	1.0	0.055	B	0.043	3580		14.6	8.8		0.060	4.7	X	0.10
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	0.93	U	0.93	0.039	U	0.039	3500		13.3	6.5		0.055	5.5	X	0.095
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	0.97	U	0.97	0.041	U	0.041	3860		14.0	8.7		0.057	5.7	X	0.099
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	1.0	U	1.0	0.042	U	0.042	5890		14.4	11.6		0.059	6.4	X	0.10
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	1.0	U	1.0	0.064	B	0.042	3920		14.5	8.3		0.060	6.7	X	0.10

Attachment	1	Sheet No.	2 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	12.5		1.81	0.23	U	0.23	21700		18.1	4.66		0.907	4670		4.53
Duplicate of J19YB9	J19YD0	5/18/10	11.4		1.39	0.21	U	0.21	18700		13.9	5.41		0.695	4110		3.48
SZ-1	J19YB8	5/18/10	12.2		1.48	0.06	B	0.21	14800		14.8	3.44		0.742	3840		3.71
SZ-3	J19YC0	5/18/10	13.1		1.60	0.20	U	0.20	18100		16.0	8.37		0.801	4500		4.01
SZ-4	J19YC1	5/18/10	16.1		1.80	0.21	U	0.21	17500		18.0	15.2		0.902	4070		4.51
SZ-5	J19YC2	5/18/10	13.0		1.53	0.21	U	0.21	17400		15.3	15.9		0.767	4190		3.83
SZ-6	J19YC3	5/18/10	12.8		1.67	0.21	U	0.21	20200		16.7	6.41		0.837	4140		4.18
SZ-7	J19YC4	5/18/10	13.3		1.94	0.21	U	0.21	17900		19.4	17.3		0.971	4300		4.86
SZ-8	J19YC5	5/18/10	12.0		1.51	0.21	U	0.21	18000		15.1	15.1		0.753	4010		3.77
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	17.3		0.21	0.145	U	0.145	15400	X	3.6	8.0		0.26	4420	X	3.5
SZ-10	J19YC7	5/18/10	14.3		1.36	0.21	U	0.21	17100		13.6	24.2		0.678	4050		3.39
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	14.5		0.19	0.146	U	0.146	18000	X	3.3	2.3		0.24	3720	X	3.2
SZ-12	J19YC9	5/18/10	12.5		1.72	0.21	U	0.21	16500		17.2	5.8		0.859	4650		4.30
DZ-8 re-sample 2[a]	J1HH85	4/13/11	18.5		0.20				14500		3.5	14.3	X	0.25	3940		3.4
DZ-8	J19YD8	5/18/10	11.9		1.93	0.21	U	0.21	15500		19.3	7.78		0.97	3270		4.83
Duplicate of J1HH85[a]	J1HH86	4/13/11	16.2		0.21				15100		3.7	17.3	X	0.26	4280		3.6
Duplicate of J19YD1	J19YF3	5/18/10	12.7		1.86	0.21	U	0.21	16200		18.6	14.3		0.93	3950		4.65
DZ-1 re-sample 2[a]	J1HH80	4/13/11	14.0		0.21				16600		3.7	18.5	X	0.26	4030		3.6
DZ-1	J19YD1	5/18/10	12.8		1.47	0.21	U	0.21	15500		14.7	12.5		0.74	3430		3.68
DZ-2 re-sample 2[a]	J1HH81	4/13/11	15.3		0.20				18500		3.5	4.2	X	0.25	3430		3.4
DZ-2	J19YD2	5/18/10	13.6		2.07	0.21	U	0.21	20400		20.7	7.09		1.03	4290		5.17
DZ-3 re-sample 2[a]	J1HH82	4/13/11	13.4		0.21				18200		3.7	2.9	X	0.26	4190		3.6
DZ-3	J19YD3	5/18/10	12.8		2.10	0.21	U	0.21	18600		21.0	7.83		1.05	4410		5.24
DZ-4 re-sample 2[a]	J1HH83	4/13/11	14.4		0.21				16800		3.6	11.4	X	0.26	4410		3.6
DZ-4	J19YD4	5/18/10	13.4		1.39	0.21	U	0.21	17500		13.9	13.1		0.70	4250		3.48
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	12.8		0.21				12800	X	3.6	31.3		0.26	3480		3.5
DZ-5	J19YD5	5/18/10	13.5		1.58	0.21	U	0.21	17800		15.8	58.2		0.79	4230		3.94
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	15.4		0.19				13900	X	3.4	8.4		0.24	3340		3.3
DZ-6	J19YD6	5/18/10	13.8		1.43	0.21	U	0.21	16500		14.3	15.5		0.71	4120		3.56
DZ-7 re-sample 2[a]	J1HH84	4/13/11	11.7		0.23				12500		3.9	11.3	X	0.28	3520		3.8
DZ-7	J19YD7	5/18/10	14.9		1.59	0.21	U	0.21	18300		15.9	22.8		0.79	4270		3.97
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	12.7		0.21				15300	X	3.6	3.5		0.26	3050		3.5
DZ-9	J19YD9	5/18/10	13.4		1.74	0.21	U	0.21	17800		17.4	14.4		0.87	4120		4.35
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	13.6		0.21				14800	X	3.8	6.0		0.27	3820		3.7
DZ-10	J19YF0	5/18/10	14.1		1.50	0.21	U	0.21	17000		15.0	12.7		0.75	3130		3.74
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	15.9		0.22				16000	X	3.9	8.4		0.27	4590		3.8
DZ-11	J19YF1	5/18/10	14.9		1.68	0.21	U	0.21	17400		16.8	15.8		0.84	3970		4.21
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	15.8		0.22				18800	X	3.9	9.8		0.28	3900		3.8
DZ-12	J19YF2	5/18/10	13.6		1.56	0.21	U	0.21	17000		15.6	14.7		0.78	4250		3.90

Attachment	1	Sheet No.	3 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	278		0.907	0.015	B	0.03	0.294	B	0.907	15.6		2.27	1200		90.7
Duplicate of J19YB9	J19YD0	5/18/10	256		0.695	0.027	U	0.027	0.243	B	0.695	12.2		1.74	1100		69.5
SZ-1	J19YB8	5/18/10	227		0.742	0.026	U	0.026	0.252	B	0.742	8.94		1.86	668		74.2
SZ-3	J19YC0	5/18/10	268		0.801	0.019	B	0.03	0.271	B	0.801	10.9		2.00	1600		80.1
SZ-4	J19YC1	5/18/10	257		0.902	0.026	U	0.026	0.276	B	0.902	9.84		2.25	921		90.2
SZ-5	J19YC2	5/18/10	263		0.767	0.024	U	0.24	0.233	B	0.767	10		1.92	868		76.7
SZ-6	J19YC3	5/18/10	274		0.837	0.018	B	0.03	0.321	B	0.837	10.8		2.09	1130		83.7
SZ-7	J19YC4	5/18/10	272		0.971	0.03	U	0.03	0.26	B	0.971	10		2.43	986		97.1
SZ-8	J19YC5	5/18/10	270		0.753	0.027	U	0.027	0.252	B	0.753	10.2		1.88	1210		75.3
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	284	X	0.095	0.0054	U	0.0054	0.25	U	0.25	11.1	X	0.12	853		39.1
SZ-10	J19YC7	5/18/10	266		0.678	0.011	B	0.02	0.25	B	0.678	9.63		1.70	884		67.8
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	234	X	0.087	0.0050	U	0.0050	0.23	U	0.23	11.5	X	0.11	425		35.8
SZ-12	J19YC9	5/18/10	251		0.859	0.027	U	0.027	0.298	B	0.859	12.5		2.15	642		85.9
DZ-8 re-sample 2[a]	J1HH85	4/13/11	221		0.091	0.019		0.0050	0.24	U	0.24	9.9	X	0.11	843		37.5
Duplicate of J1HH85[a]	J1HH86	4/13/11	228		0.097	0.020		0.0050	0.25	U	0.25	11.3	X	0.12	891		39.9
DZ-1 re-sample 2[a]	J1HH80	4/13/11	283		0.098	0.0055	U	0.0055	0.25	U	0.25	10.6	X	0.12	897		40.1
DZ-2 re-sample 2[a]	J1HH81	4/13/11	252		0.093	0.0051	U	0.0051	0.24	U	0.24	8.1	X	0.11	516		37.9
DZ-3 re-sample 2[a]	J1HH82	4/13/11	231		0.098	0.0053	U	0.0053	0.25	U	0.25	12.8	X	0.12	545		40.1
DZ-4 re-sample 2[a]	J1HH83	4/13/11	261		0.096	0.0057	U	0.0057	0.87	B	0.25	11.5	X	0.12	1050		39.4
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	209		0.095	0.0056	U	0.0056	0.25	U	0.25	10.1	X	0.12	711		39.0
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	217		0.090	0.0057	U	0.0057	0.23	U	0.23	9.2	X	0.11	573		36.7
DZ-7 re-sample 2[a]	J1HH84	4/13/11	206		0.10	0.0063	U	0.0063	0.27	U	0.27	12.2	X	0.13	634		42.6
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	219		0.095	0.0055	U	0.0055	0.25	U	0.25	6.8	X	0.12	542		38.8
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	230		0.099	0.0054	U	0.0054	0.26	U	0.26	9.2	X	0.12	577		40.6
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	260		0.10	0.0060	U	0.0060	0.26	U	0.26	13.5	X	0.13	1300		41.7
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	284		0.10	0.0052	U	0.0052	0.27	U	0.27	11.3	X	0.13	782		42.3

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.272	U	0.27	571		5.44	0.907	U	0.91	165		45.3	52.6		0.91
Duplicate of J19YB9	J19YD0	5/18/10	0.209	U	0.21	512		4.17	0.695	U	0.7	147		34.8	43.7		0.7
SZ-1	J19YB8	5/18/10	0.223	U	0.22	415		4.45	0.742	U	0.74	181		37.1	42.9		0.74
SZ-3	J19YC0	5/18/10	0.24	U	0.24	521		4.81	0.801	U	0.8	210		40.1	47		0.8
SZ-4	J19YC1	5/18/10	0.271	U	0.27	658		5.41	0.902	U	0.9	181		45.1	46.8		0.9
SZ-5	J19YC2	5/18/10	0.23	U	0.23	974		4.6	0.767	U	0.77	192		38.3	46.1		0.77
SZ-6	J19YC3	5/18/10	0.251	U	0.25	1000		5.02	0.837	U	0.84	214		41.8	52.8		0.84
SZ-7	J19YC4	5/18/10	0.291	U	0.29	1150		5.83	0.971	U	0.97	200		48.6	49.4		0.97
SZ-8	J19YC5	5/18/10	0.226	U	0.23	473		4.52	0.753	U	0.75	193		37.7	45.2		0.75
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.82	U	0.82	188		5.4	0.15	U	0.15	184		56.3	42.6		0.090
SZ-10	J19YC7	5/18/10	0.204	U	0.2	399		4.07	0.678	U	0.68	212		33.9	45.4		0.68
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.75	U	0.75	117		4.9	0.14	U	0.14	246		51.6	47.4		0.082
SZ-12	J19YC9	5/18/10	0.258	U	0.26	493		5.15	0.859	U	0.86	177		43	46.6		0.86
DZ-8 re-sample 2[a]	J1HH85	4/13/11	0.79	U	0.79	192		5.2	0.15	U	0.15	244		53.9	35.9		0.086
Duplicate of J1HH85[a]	J1HH86	4/13/11	0.84	U	0.84	219		5.5	0.16	U	0.16	236		57.4	37.1		0.091
DZ-1 re-sample 2[a]	J1HH80	4/13/11	0.84	U	0.84	241	N	5.5	0.16	U	0.16	236		57.7	40.3		0.092
DZ-2 re-sample 2[a]	J1HH81	4/13/11	0.80	U	0.80	131		5.2	0.15	U	0.15	323		54.6	48.7		0.087
DZ-3 re-sample 2[a]	J1HH82	4/13/11	0.84	U	0.84	126		5.5	0.16	U	0.16	320		57.6	56.4		0.092
DZ-4 re-sample 2[a]	J1HH83	4/13/11	0.83	U	0.83	352		5.4	0.15	U	0.15	257		56.6	41.9		0.090
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	0.82	U	0.82	174		5.4	0.15	U	0.15	215		56.1	33.6		0.089
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	0.77	U	0.77	174		5.1	0.14	U	0.14	388		52.9	39.4		0.084
DZ-7 re-sample 2[a]	J1HH84	4/13/11	0.89	U	0.89	245		5.9	0.17	U	0.17	163		61.3	30.5		0.098
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	0.81	U	0.81	112		5.4	0.15	U	0.15	285		55.8	47.9		0.089
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	0.85	U	0.85	169		5.6	0.16	U	0.16	281		58.4	35.4		0.093
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	0.88	U	0.88	200		5.8	0.16	U	0.16	300		60.0	40.9		0.096
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	0.89	U	0.89	209		5.8	0.17	U	0.17	270		60.9	54.7		0.097

Attachment	1	Sheet No.	5 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	37.8		2.72
Duplicate of J19YB9	J19YD0	5/18/10	33.9		2.09
SZ-1	J19YB8	5/18/10	29		2.23
SZ-3	J19YC0	5/18/10	68.7		2.4
SZ-4	J19YC1	5/18/10	38		2.71
SZ-5	J19YC2	5/18/10	33.4		2.3
SZ-6	J19YC3	5/18/10	39.2		2.51
SZ-7	J19YC4	5/18/10	35.8		2.91
SZ-8	J19YC5	5/18/10	69.8		2.26
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	35.2	X	0.38
SZ-10	J19YC7	5/18/10	34.8		2.04
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	34.3	X	0.35
SZ-12	J19YC9	5/18/10	35.5		2.58
DZ-8 re-sample 2[a]	J1HH85	4/13/11	60.8		0.36
Duplicate of J1HH85[a]	J1HH86	4/13/11	77.2		0.39
DZ-1 re-sample 2[a]	J1HH80	4/13/11	39.0		0.39
DZ-2 re-sample 2[a]	J1HH81	4/13/11	35.5		0.37
DZ-3 re-sample 2[a]	J1HH82	4/13/11	34.4		0.39
DZ-4 re-sample 2[a]	J1HH83	4/13/11	38.9		0.38
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	27.4	X	0.38
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	31.6	X	0.36
DZ-7 re-sample 2[a]	J1HH84	4/13/11	29.6		0.41
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	30.9	X	0.38
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	31.3	X	0.39
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	44.7	X	0.41
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	46.2	X	0.41

Attachment	1	Sheet No.	6 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	6390		16.3	0.344	B	0.813	4.95		0.813	51.4		0.407	0.162	B	0.163
Duplicate of J19YF8	J19YH6	5/13/10	6090		19.0	0.388	B	0.951	4.74		0.951	47.2		0.478	0.149	B	0.190
OB-1	J19YF4	5/13/10	6570		14.4	0.377	B	0.722	3.27		0.722	50.9		0.361	0.153		0.144
OB-2	J19YF5	5/13/10	6610		18.2	0.437	B	0.912	4.17		0.912	51.8		0.456	0.161	B	0.182
OB-3	J19YF6	5/13/10	6150		17.1	0.464	B	0.854	6.21		0.854	47.8		0.427	0.169	B	0.171
OB-4	J19YF7	5/13/10	6270		16.8	0.272	B	0.840	3.96		0.840	48.5		0.420	0.162	B	0.168
OB-6	J19YF9	5/13/10	6990		17.4	0.426	B	0.869	8.14		0.869	54.4		0.434	0.197		0.174
OB-7	J19YH0	5/13/10	5560		17.1	0.279	B	0.855	5.13		0.855	43.1		0.427	0.149	B	0.171
OB-8 re-sample 1[a]	J1FKL6	3/17/11	6320	X	1.5	0.37	U	0.37	6.5		0.63	49.8	X	0.073	0.12	B	0.032
OB-9	J19YH2	5/13/10	5590		15.5	0.773	U	0.773	3.59		0.773	48.7		0.386	0.136	B	0.155
OB-10	J19YH3	5/13/10	5600		18.7	0.309	B	0.933	4.77		0.933	37.8		0.466	0.14	B	0.187
OB-11	J19YH4	5/13/10	7240		17.1	0.491	B	0.854	6.82		0.854	67.6		0.427	0.208		0.171
OB-12	J19YH5	5/13/10	6330		15.5	0.469	B	0.776	5.29		0.776	46.4		0.388	0.175		0.155
OB-13	J1B4H9	5/17/10	6330		13.0	0.254	B	0.652	4.23		0.652	57.1		0.326	0.181		0.130
OB-14	J1B4J0	5/17/10	5690		15.4	0.772	U	0.772	4.75		0.772	46.2		0.386	0.147	B	0.154
OB-15	J1B4J1	5/17/10	6580		17.6	0.274	B	0.881	6.1		0.881	57.4		0.441	0.181		0.176
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	5420	X	1.4	0.33	U	0.33	1.7		0.58	32.9	X	0.067	0.085	B	0.029
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	5260	X	1.6	0.40	U	0.40	2.1		0.69	36.4	X	0.079	0.074	B	0.034
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	5400	X	1.4	0.34	U	0.34	2.2		0.59	36.4	X	0.067	0.089	B	0.029
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	5490	X	1.5	0.37	U	0.37	1.7		0.64	33.5	X	0.074	0.079	B	0.032
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	4220	X	1.3	0.33	U	0.33	1.5		0.57	37.3	X	0.066	0.069	B	0.029
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	6890	X	1.4	0.34	U	0.34	7.8		0.58	88.8	X	0.067	0.15	B	0.029
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	6790	X	1.4	0.34	U	0.34	9.1		0.59	60.5	X	0.068	0.15	B	0.030
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	8050	X	1.6	0.40	U	0.40	14.1		0.69	126	X	0.079	0.17	B	0.034
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	7710	X	1.6	0.40	U	0.40	6.7		0.70	68.3	X	0.080	0.10	B	0.035
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	9590	X	1.6	0.38	U	0.38	12.2		0.67	82.9	X	0.077	0.22		0.033
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	6210	X	1.5	0.37	U	0.37	3.4		0.65	40.6	X	0.075	0.047	B	0.032
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	4580	X	1.3	0.33	U	0.33	2.2		0.56	43.0	X	0.065	0.028	B	0.028
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	7770	X	1.4	0.34	U	0.34	14.2		0.59	72.5	X	0.068	0.16	B	0.030
Equipment Blank	J19YK0	5/17/10	153		14.9	0.743	U	0.74	0.254	B	0.74	1.76		0.37	0.149	U	0.15
Equipment Blank	J1FKN0	3/17/11	239	X	1.3	0.33	U	0.33	0.57	U	0.57	10.3	X	0.066	0.091	B	0.028
Equipment Blank	J1HH87	4/13/11	238		1.3	0.33	U	0.33	0.57	U	0.57	2.8		0.066	0.041	B	0.029

Attachment	1	Sheet No.	7 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	0.938	B	1.63	0.203	U	0.203	4560		16.3	10.4		0.813	5.41		2.44
Duplicate of J19YF8	J19YH6	5/13/10	0.842	B	1.90	0.238	U	0.238	4040		19.0	10.1		0.951	5.16		2.85
OB-1	J19YF4	5/13/10	0.853	B	1.44	0.180	U	0.180	4160		14.4	13.2		0.722	5.37		2.17
OB-2	J19YF5	5/13/10	0.958	B	1.82	0.054	B	0.228	4630		18.2	11.4		0.912	5.34		2.74
OB-3	J19YF6	5/13/10	0.916	B	1.71	0.213	U	0.213	5800		17.1	10.7		0.854	5.52		2.56
OB-4	J19YF7	5/13/10	0.902	B	1.68	0.210	U	0.210	4410		16.8	11.7		0.840	5.15		2.52
OB-6	J19YF9	5/13/10	1.17	B	1.74	0.07	B	0.217	5210		17.4	11.7		0.869	5.8		2.61
OB-7	J19YH0	5/13/10	0.805	B	1.71	0.084	B	0.214	4150		17.1	9.84		0.855	4.93		2.56
OB-8 re-sample 1[a]	J1FKL6	3/17/11	1.3	B	0.94	0.064	B	0.039	5160	X	13.6	10.6	X	0.056	6.1	X	0.096
OB-9	J19YH2	5/13/10	0.752	B	1.55	0.193	U	0.193	4190		15.5	9.58		0.773	4.95		2.32
OB-10	J19YH3	5/13/10	0.843	B	1.87	0.233	U	0.233	5630		18.7	9.93		0.933	5.27		2.80
OB-11	J19YH4	5/13/10	1.34	B	1.71	0.064	B	0.214	5250		17.1	12.8		0.854	5.88		2.56
OB-12	J19YH5	5/13/10	1.15	B	1.55	0.039	B	0.194	5470		15.5	11.7		0.776	5.39		2.33
OB-13	J1B4H9	5/17/10	2.55		1.30	0.068	B	0.163	5530		13.0	10.3		0.652	5.36		1.96
OB-14	J1B4J0	5/17/10	1.70		1.54	0.042	B	0.193	5670		15.4	11		0.772	4.92		2.32
OB-15	J1B4J1	5/17/10	2.02		1.76	0.057	B	0.220	5740		17.6	11.1		0.881	5.9		2.64
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.86	U	0.86	0.054	B	0.036	5790	X	12.4	8.8	X	0.051	4.9	X	0.088
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	1.0	U	1.0	0.079	B	0.043	5660	X	14.7	9.6	X	0.060	5.1	X	0.10
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.88	B	0.87	0.043	B	0.036	5780	X	12.5	9.2	X	0.051	4.9	X	0.089
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.95	U	0.95	0.049	B	0.040	5380	X	13.7	9.4	X	0.056	5.2	X	0.097
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.85	U	0.85	0.077	B	0.036	4860	X	12.2	6.1	X	0.050	4.5	X	0.087
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	6.9		0.87	0.15	B	0.036	5800	X	12.4	11.0	X	0.051	6.3	X	0.088
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	2.1		0.88	0.11	B	0.037	4130	X	12.7	9.6	X	0.052	6.0	X	0.090
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	1.7	B	1.0	0.12	B	0.043	5220	X	14.7	11.9	X	0.061	7.2	X	0.10
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	1.2	B	1.0	0.10	B	0.043	12100	X	14.9	10.5	X	0.061	7.2	X	0.11
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	1.4	B	0.99	0.14	B	0.041	4170	X	14.2	13.1	X	0.058	7.9	X	0.10
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.96	U	0.96	0.059	B	0.040	4320	X	13.9	9.4	X	0.057	6.7	X	0.098
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.84	U	0.84	0.077	B	0.035	4910	X	12.1	9.4	X	0.050	6.8	X	0.086
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	1.8		0.88	0.12	B	0.037	4960	X	12.7	11.6	X	0.052	6.8	X	0.090
Equipment Blank	J19YK0	5/17/10	1.49	U	1.49	0.186	U	0.19	29.6		14.9	0.18	B	0.74	2.23	U	2.23
Equipment Blank	J1FKN0	3/17/11	0.9	U	0.85	0.035	U	0.035	56.6	XC	12.2	0.29	X	0.050	1.4	X	0.086
Equipment Blank	J1HH87	4/13/11	0.85	U	0.85	0.036	U	0.036	62.3		12.3	0.22	C	0.050	0.1	BX	0.087

Attachment	1	Sheet No.	8 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	12.7		1.63	0.20	U	0.20	16200		16.3	13.1		0.813	4170		4.07
Duplicate of J19YF8	J19YH6	5/13/10	12.7		1.90	0.16	B	0.20	15800		19.0	13.0		0.951	4130		4.76
OB-1	J19YF4	5/13/10	13.5		1.44	0.15	B	0.20	16600		14.4	6.95		0.722	4520		3.61
OB-2	J19YF5	5/13/10	14.3		1.82	0.11	B	0.20	16700		18.2	10.3		0.912	4360		4.56
OB-3	J19YF6	5/13/10	13.5		1.71	0.18	B	0.20	17100		17.1	17.6		0.854	4020		4.27
OB-4	J19YF7	5/13/10	13.8		1.68	0.15	B	0.20	16400		16.8	7.44		0.840	4250		4.20
OB-6	J19YF9	5/13/10	13.2		1.74	0.14	B	0.20	18000		17.4	25.2		0.869	4020		4.34
OB-7	J19YH0	5/13/10	13.4		1.71	0.20	B	0.20	14600		17.1	16.8		0.855	3530		4.27
OB-8 re-sample 1[a]	J1FKL6	3/17/11	13.6		0.21	0.184		0.154	15500	X	3.7	17.9	X	0.26	3990	X	3.6
OB-9	J19YH2	5/13/10	11.7		1.55	0.12	B	0.20	15300		15.5	8.91		0.773	3670		3.86
OB-10	J19YH3	5/13/10	12.4		1.87	0.17	B	0.20	14300		18.7	11.3		0.933	3790		4.66
OB-11	J19YH4	5/13/10	14.5		1.71	0.15	B	0.20	17600		17.1	22.4		0.854	4120		4.27
OB-12	J19YH5	5/13/10	13.4		1.55	0.11	B	0.20	16500		15.5	14.0		0.776	4300		3.88
OB-13	J1B4H9	5/17/10	12.9		1.30	0.20	U	0.20	16800		13	10.5		0.652	3750		3.26
OB-14	J1B4J0	5/17/10	12.2		1.54	0.20	U	0.20	15300		15.4	12.3		0.772	3440		3.86
OB-15	J1B4J1	5/17/10	13.6		1.76	0.20	U	0.20	17200		17.6	14.3		0.881	4000		4.41
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	12.3		0.19	0.154	U	0.154	12900	X	3.3	2.7	X	0.24	3760	X	3.3
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	11.4		0.23	0.154	U	0.154	13100	X	4.0	2.4	X	0.28	4040	X	3.8
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	11.3		0.19	0.154	U	0.154	13000	X	3.4	2.0	X	0.24	3940	X	3.3
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	12.1		0.21	0.154	U	0.154	13400	X	3.7	2.1	X	0.26	4010	X	3.6
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	12.5		0.19	0.151	U	0.151	11300	X	3.3	2.3	X	0.23	2900	X	3.2
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	15.9		0.19	0.153	U	0.153	15600	X	3.4	30.7	X	0.24	4310	X	3.3
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	13.5		0.19	0.155	U	0.155	15000	X	3.4	35.3	X	0.24	3760	X	3.3
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	15.6		0.23	0.153	U	0.153	19000	X	4.0	70.5	X	0.28	4260	X	3.9
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	17.0		0.23	0.154	U	0.154	20400	X	4.0	20.0	X	0.29	4790	X	3.9
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	14.9		0.22	0.154	U	0.154	19900	X	3.8	32.7	X	0.27	4600	X	3.7
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	14.0		0.21	0.154	U	0.154	17700	X	3.7	5.5	X	0.27	3650	X	3.6
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	12.9		0.19	0.154	U	0.154	18100	X	3.3	2.3	X	0.23	3370	X	3.2
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	14.0		0.20	0.154	U	0.154	18000	X	3.4	58.5	X	0.24	4100	X	3.3
Equipment Blank	J19YK0	5/17/10	1.49	U	1.49				240		14.9	0.426	B	0.74	18.4		3.71
Equipment Blank	J1FKN0	3/17/11	0.33	B	0.19				1920	X	3.3	1.5	X	0.23	29.6	X	3.2
Equipment Blank	J1HH87	4/13/11	0.19	B	0.19				465		3.3	0.41	BX	0.23	35.1		3.2

Attachment	1	Sheet No.	9 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	250		0.813	0.024	U	0.024	0.200	B	0.813	11.1		2.03	819		81.3
Duplicate of J19YF8	J19YH6	5/13/10	239		0.951	0.028	U	0.028	0.951	U	0.951	10.6		2.38	742		95.1
OB-1	J19YF4	5/13/10	266		0.722	0.025	U	0.025	0.250	B	0.722	10.9		1.80	741		72.2
OB-2	J19YF5	5/13/10	259		0.912	0.028	U	0.028	0.352	B	0.912	11.0		2.28	822		91.2
OB-3	J19YF6	5/13/10	251		0.854	0.025	U	0.025	0.232	B	0.854	10.1		2.13	970		85.4
OB-4	J19YF7	5/13/10	256		0.840	0.025	U	0.025	0.276	B	0.840	10.5		2.10	782		84.0
OB-6	J19YF9	5/13/10	272		0.869	0.025	U	0.025	0.313	B	0.869	9.82		2.17	1240		86.9
OB-7	J19YH0	5/13/10	220		0.855	0.026	U	0.026	0.227	B	0.855	9.49		2.14	807		85.5
OB-8 re-sample 1[a]	J1FKL6	3/17/11	253	X	0.096	0.0053	U	0.0053	0.25	U	0.25	10.3	X	0.12	917		39.4
OB-9	J19YH2	5/13/10	224		0.773	0.028	U	0.028	0.167	B	0.773	8.89		1.93	762		77.3
OB-10	J19YH3	5/13/10	244		0.933	0.026	U	0.026	0.933	U	0.933	9.11		2.33	770		93.3
OB-11	J19YH4	5/13/10	276		0.854	0.025	U	0.025	0.199	B	0.854	11.6		2.14	1280		85.4
OB-12	J19YH5	5/13/10	248		0.776	0.028	U	0.028	0.209	B	0.776	11.9		1.94	973		77.6
OB-13	J1B4H9	5/17/10	250		0.652	0.026	U	0.026	0.272	B	0.652	9.50		1.63	1050		65.2
OB-14	J1B4J0	5/17/10	227		0.772	0.026	U	0.026	0.308	B	0.772	9.29		1.93	955		77.2
OB-15	J1B4J1	5/17/10	262		0.881	0.023	U	0.023	0.289	B	0.881	11.8		2.2	1080		88.1
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	222	X	0.088	0.0054	U	0.0054	0.23	U	0.23	8.3	X	0.11	601		36.1
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	225	X	0.10	0.0052	U	0.0052	0.27	U	0.27	10.3	X	0.13	689		42.6
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	218	X	0.089	0.0056	U	0.0056	0.23	U	0.23	9.4	X	0.11	650		36.4
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	231	X	0.097	0.0056	U	0.0056	0.25	U	0.25	10.5	X	0.12	612		39.8
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	182	X	0.087	0.0058	U	0.0058	0.23	U	0.23	7.0	X	0.11	487		35.5
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	254	X	0.088	0.013	B	0.0056	0.33	B	0.23	10.8	X	0.11	1150		36.2
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	252	X	0.090	0.0080	B	0.0057	0.23	U	0.23	9.5	X	0.11	1180		36.8
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	300	X	0.10	0.0083	B	0.0060	0.27	U	0.27	11.2	X	0.13	1430		42.8
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	286	X	0.11	0.014	B	0.0056	0.28	U	0.28	9.7	X	0.13	1190		43.4
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	362	X	0.10	0.0053	U	0.0053	0.26	U	0.26	12.8	X	0.12	1750		41.3
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	230	X	0.098	0.0054	U	0.0054	0.26	U	0.26	10.2	X	0.12	638		40.3
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	241	X	0.086	0.0057	U	0.0057	0.22	U	0.22	8.0	X	0.11	509		35.1
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	294	X	0.090	0.011	BN	0.0054	0.23	U	0.23	10.6	X	0.11	1310		36.9
Equipment Blank	J19YK0	5/17/10	4.5		0.74	0.025	U	0.025	0.743	U	0.743	1.86	U	1.86	47	B	74.3
Equipment Blank	J1FKN0	3/17/11	111	X	0.086	0.0054	U	0.0054	0.22	U	0.22	0.40	BX	0.11	58.7	B	35.4
Equipment Blank	J1HH87	4/13/11	4.9		0.087	0.0053	U	0.0053	0.23	U	0.23	0.22	BX	0.11	57.3	B	35.7

Attachment	1	Sheet No.	10 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	0.244	U	0.244	172		4.88	0.813	U	0.813	190		40.7	42.5		0.813
Duplicate of J19YF8	J19YH6	5/13/10	0.285	U	0.285	196		5.71	0.951	U	0.951	190		47.6	39.5		0.951
OB-1	J19YF4	5/13/10	0.217	U	0.217	136		4.33	0.722	U	0.722	206		36.1	41.7		0.722
OB-2	J19YF5	5/13/10	0.274	U	0.274	213		5.47	0.912	U	0.912	191		45.6	46.4		0.912
OB-3	J19YF6	5/13/10	0.256	U	0.256	188		5.12	0.854	U	0.854	182		42.7	45.3		0.854
OB-4	J19YF7	5/13/10	0.252	U	0.252	187		5.04	0.840	U	0.840	174		42.0	43.6		0.840
OB-6	J19YF9	5/13/10	0.261	U	0.261	181		5.21	0.869	U	0.869	201		43.4	46.5		0.869
OB-7	J19YH0	5/13/10	0.256	U	0.256	177		5.13	0.855	U	0.855	163		42.7	38.8		0.855
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.83	U	0.83	224	N	5.4	0.15	U	0.15	235		56.7	42.1		0.090
OB-9	J19YH2	5/13/10	0.232	U	0.232	161		4.64	0.773	U	0.773	159		38.6	41.5		0.773
OB-10	J19YH3	5/13/10	0.280	U	0.280	200		5.6	0.933	U	0.933	180		46.6	39.4		0.933
OB-11	J19YH4	5/13/10	0.256	U	0.256	163		5.13	0.854	U	0.854	172		42.7	45.5		0.854
OB-12	J19YH5	5/13/10	0.233	U	0.233	178		4.66	0.776	U	0.776	178		38.8	44.8		0.776
OB-13	J1B4H9	5/17/10	0.196	U	0.196	470		3.91	0.138	B	0.652	187		32.6	45.1		0.652
OB-14	J1B4J0	5/17/10	0.232	U	0.232	434		4.63	0.156	B	0.772	173		38.6	42.1		0.772
OB-15	J1B4J1	5/17/10	0.264	U	0.264	501		5.29	0.881	U	0.881	220		44.1	44.9		0.881
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.76	U	0.76	164	N	5.0	0.14	U	0.14	185		52.0	35.8		0.083
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.89	U	0.89	195	N	5.9	0.17	U	0.17	203		61.4	38.0		0.098
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.76	U	0.76	153	N	5.0	0.14	U	0.14	190		52.3	36.8		0.083
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.83	U	0.83	154	N	5.5	0.16	U	0.16	180		57.3	38.4		0.091
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.75	U	0.75	144	N	4.9	0.14	U	0.14	184		51.2	36.4		0.081
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.76	U	0.76	306	N	5.0	0.14	U	0.14	287		52.1	41.1		0.083
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.77	U	0.77	246	N	5.1	0.14	U	0.14	190		53.0	36.1		0.084
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.90	U	0.90	269	N	5.9	0.17	U	0.17	226		61.6	46.4		0.098
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.91	U	0.91	221	N	6.0	0.17	U	0.17	292		62.4	59.2		0.099
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.87	U	0.87	359	N	5.7	0.16	U	0.16	230		59.5	45.4		0.095
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.85	U	0.85	190	N	5.6	0.16	U	0.16	315		58.0	49.8		0.092
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.74	U	0.74	167	N	4.8	0.14	U	0.14	268		50.5	53.3		0.080
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.77	U	0.77	242	N	5.1	0.14	U	0.14	208		53.1	45.8		0.085
Equipment Blank	J19YK0	5/17/10	0.223	U	0.22	171		4.46	0.743	U	0.743	37.1	U	37.1	0.27	B	0.74
Equipment Blank	J1FKN0	3/17/11	0.74	U	0.74	90.8	N	4.9	0.14	U	0.14	50.9	U	50.9	0.69	B	0.081
Equipment Blank	J1HH87	4/13/11	0.75	U	0.75	119		4.9	0.14	U	0.14	51.3	U	51.3	0.87	B	0.082

Attachment	1	Sheet No.	11 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	32.2		2.44
Duplicate of J19YF8	J19YH6	5/13/10	31.2		2.85
OB-1	J19YF4	5/13/10	32.8		2.17
OB-2	J19YF5	5/13/10	41.2		2.74
OB-3	J19YF6	5/13/10	33.3		2.56
OB-4	J19YF7	5/13/10	33.2		2.52
OB-6	J19YF9	5/13/10	39.0		2.61
OB-7	J19YH0	5/13/10	55.3		2.56
OB-8 re-sample 1[a]	J1FKL6	3/17/11	34.3	X	0.38
OB-9	J19YH2	5/13/10	30.1		2.32
OB-10	J19YH3	5/13/10	29.4		2.80
OB-11	J19YH4	5/13/10	44.4		2.56
OB-12	J19YH5	5/13/10	33.1		2.33
OB-13	J1B4H9	5/17/10	59.6		1.96
OB-14	J1B4J0	5/17/10	37.0		2.32
OB-15	J1B4J1	5/17/10	49.4		2.64
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	28.4	X	0.35
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	28.1	X	0.41
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	26.4	X	0.35
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	27.9	X	0.39
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	25.7	X	0.35
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	40.6	X	0.35
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	36.4	X	0.36
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	44.8	X	0.42
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	44.6	X	0.42
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	48.6	X	0.40
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	32.8	X	0.39
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	32.9	X	0.34
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	43.5	X	0.36
Equipment Blank	J19YK0	5/17/10	2.23	U	2.23
Equipment Blank	J1FKN0	3/17/11	4.8	X	0.34
Equipment Blank	J1HH87	4/13/11	1.4	C	0.35

Attachment	1	Sheet No.	12 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	7010		19.9	0.993	UJ	0.993	6.51		0.993	54.7		0.50	0.203		0.200
SZ-11	J19YC8	5/18/10	7590		19.2	0.960	U	0.960	4.69		0.960	72.2		0.48	0.235		0.190
DZ-8	J19YD8	5/18/10	5390		19.3	0.967	UJ	0.967	3.23		0.967	56.6		0.48	0.147	B	0.190
DZ-8 re-sample 1	J1FKK8	3/16/11	6320		1.5	0.370	U	0.370	5.70		0.64	42.3		0.074	0.032	U	0.032
DZ-1	J19YD1	5/18/10	5570		14.7	0.737	UJ	0.737	4.46		0.737	42.1		0.37	0.164		0.150
DZ-1 re-sample 1	J1FKK1	3/16/11	6490		1.4	0.350	U	0.350	4.40		0.60	47.2		0.069	0.030	U	0.030
DZ-2	J19YD2	5/18/10	5380		20.7	1.03	UJ	1.03	3.41		1.03	67.9		0.52	0.147	B	0.210
DZ-2 re-sample 1	J1FKK2	3/16/11	5760		1.6	0.390	U	0.390	4.40		0.67	57.6		0.078	0.034	U	0.034
DZ-3	J19YD3	5/18/10	6880		21.0	1.05	UJ	1.05	3.95		1.05	61.4		0.52	0.200	B	0.210
DZ-3 re-sample 1	J1FKK3	3/16/11	8880		1.7	0.420	U	0.420	4.50		0.72	72.5		0.083	0.15	B	0.036
DZ-4	J19YD4	5/18/10	6780		13.9	0.696	UJ	0.696	5.30		0.696	60.8		0.35	0.185		0.140
DZ-4 re-sample 1	J1FKK4	3/16/11	5760		1.5	0.380	U	0.380	2.00		0.66	60.4		0.076	0.033	U	0.033
DZ-5	J19YD5	5/18/10	7410		15.8	0.788	UJ	0.788	17.7		0.788	57.6		0.39	0.211		0.160
DZ-6	J19YD6	5/18/10	6400		14.3	0.262	JB	0.713	5.99		0.713	47.7		0.36	0.176		0.140
DZ-7	J19YD7	5/18/10	7710		15.9	0.453	JB	0.794	8.10		0.794	57.1		0.40	0.199		0.160
DZ-7 re-sample 1	J1FKK7	3/16/11	6340		1.5	0.370	U	0.370	7.80		0.64	44.4		0.074	0.046	B	0.032
DZ-9	J19YD9	5/18/10	5790		17.4	0.870	UJ	0.870	5.10		0.870	50.7		0.44	0.174		0.170
DZ-10	J19YF0	5/18/10	5250		15.0	0.748	UJ	0.748	4.68		0.748	59.7		0.37	0.157		0.150
DZ-11	J19YF1	5/18/10	6470		16.8	0.842	U	0.842	5.85		0.842	58.2		0.42	0.191		0.170
DZ-12	J19YF2	5/18/10	6360		15.6	0.780	U	0.780	5.39		0.780	51.9		0.39	0.179		0.160
Duplicate of J19YD1	J19YF3	5/18/10	5830		18.6	0.929	U	0.929	5.30		0.929	45.4		0.47	0.164	B	0.190
Duplicate of J1FKK8	J1FKL3	3/16/11	6330		1.5	0.370	U	0.370	6.10		0.64	41.3		0.074	0.032	B	0.032
OB-8	J19YH1	5/13/10	6530		19.1	0.454	B	0.953	8.03		0.953	50		0.48	0.181	B	0.190
SPA-8	J19YJ4	5/17/10	7140		13.3	0.346	B	0.663	7.32		0.663	66.8		0.33	0.210		0.130
Duplicate of J19YJ4	J19YJ9	5/17/10	7420		16.3	0.813	U	0.813	7.94		0.813	69.3		0.41	0.229		0.160
SPA-1	J19YH7	5/17/10	5600		17.0	0.297	B	0.850	2.41		0.850	42.1		0.43	0.142	B	0.170
SPA-2	J19YH8	5/17/10	9000		14.3	0.290	B	0.717	4.14		0.717	75.1		0.36	0.269		0.140
SPA-3	J19YH9	5/17/10	9700		16.2	0.331	B	0.811	4.38		0.811	84		0.41	0.293		0.160
SPA-4	J19YJ0	5/17/10	6850		12.9	0.288	B	0.644	2.53		0.644	54.6		0.32	0.181		0.130
SPA-5	J19YJ1	5/17/10	8470		16.2	0.286	B	0.810	4.07		0.810	74.4		0.41	0.260		0.160
SPA-6	J19YJ2	5/17/10	6710		15.5	0.334	B	0.776	5.25		0.776	82.3		0.39	0.226		0.160
SPA-7	J19YJ3	5/17/10	7450		15.0	0.329	B	0.748	6.25		0.748	63.2		0.37	0.196		0.150
SPA-9	J19YJ5	5/17/10	7060		12.6	0.281	B	0.628	6.11		0.628	76.8		0.31	0.216		0.130
SPA-10	J19YJ6	5/17/10	6080		14.0	0.253	B	0.699	5.96		0.699	77.5		0.35	0.190		0.140
SPA-11	J19YJ7	5/17/10	7710		14.0	0.393	B	0.701	8.71		0.701	66.7		0.35	0.227		0.140
SPA-12	J19YJ8	5/17/10	7290		12.7	0.299	B	0.636	14.2		0.636	69.5		0.32	0.218		0.130

Attachment	1	Sheet No.	13 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	1.86	B	1.99	0.059	B	0.248	5670		19.9	10.9		0.993	5.75		2.98
SZ-11	J19YC8	5/18/10	2.92		1.92	0.098	B	0.240	5990		19.2	15.1		0.960	5.96		2.88
DZ-8	J19YD8	5/18/10	0.888	B	1.93	0.065	B	0.242	4450		19.3	8.55		0.967	4.97		2.90
DZ-8 re-sample 1	J1FKK8	3/16/11	0.95	U	0.95	0.040	U	0.040	4240		13.7	9.70		0.056	4.90	X	0.097
DZ-1	J19YD1	5/18/10	1.10	B	1.47	0.057	B	0.184	5100		14.7	8.71		0.737	5.03		2.21
DZ-1 re-sample 1	J1FKK1	3/16/11	0.89	U	0.89	0.037	U	0.037	4820		12.9	11.2		0.053	6.40	X	0.091
DZ-2	J19YD2	5/18/10	0.801	B	2.07	0.088	B	0.258	5120		20.7	10.7		1.03	7.58		3.1
DZ-2 re-sample 1	J1FKK2	3/16/11	1.00	U	1.00	0.042	U	0.042	4620		14.4	9.10		0.059	5.50	X	0.10
DZ-3	J19YD3	5/18/10	1.60	B	2.10	0.262	U	0.262	5660		21.0	15.6		1.05	5.96		3.15
DZ-3 re-sample 1	J1FKK3	3/16/11	1.10	U	1.10	0.045	U	0.045	6540		15.5	16.3		0.064	6.10	X	0.11
DZ-4	J19YD4	5/18/10	1.44		1.39	0.061	B	0.174	6420		13.9	11.5		0.696	5.77		2.09
DZ-4 re-sample 1	J1FKK4	3/16/11	0.98	U	0.98	0.041	U	0.041	4220		14.1	11.5		0.058	5.80	X	0.10
DZ-5	J19YD5	5/18/10	1.22	B	1.58	0.069	B	0.197	5060		15.8	11.3		0.788	5.80		2.36
DZ-6	J19YD6	5/18/10	1.08	B	1.43	0.048	B	0.178	5340		14.3	11.1		0.713	5.47		2.14
DZ-7	J19YD7	5/18/10	1.46	B	1.59	0.13	B	0.198	7540		15.9	19.9		0.794	5.88		2.38
DZ-7 re-sample 1	J1FKK7	3/16/11	0.95	U	0.95	0.040	U	0.040	4180		13.7	9.00		0.056	4.80	X	0.097
DZ-9	J19YD9	5/18/10	1.25	B	1.74	0.058	B	0.218	4660		17.4	9.92		0.870	5.87		2.61
DZ-10	J19YF0	5/18/10	0.902	B	1.50	0.055	B	0.187	4590		15.0	7.37		0.748	6.19		2.25
DZ-11	J19YF1	5/18/10	1.18	B	1.68	0.132	B	0.210	5760		16.8	12		0.842	5.35		2.53
DZ-12	J19YF2	5/18/10	1.07	B	1.56	0.115	B	0.195	5590		15.6	10.3		0.780	5.36		2.34
Duplicate of J19YD1	J19YF3	5/18/10	1.15	B	1.86	0.097	B	0.232	5360		18.6	9.56		0.929	5.58		2.79
Duplicate of J1FKK8	J1FKL3	3/16/11	0.96	U	0.96	0.040	U	0.040	4630		13.8	9.20		0.057	5.10	X	0.098
OB-8	J19YH1	5/13/10	1.07	B	1.91	0.238	U	0.238	5740		19.1	10.9		0.953	5.79		2.86
SPA-8	J19YJ4	5/17/10	3.26		1.33	0.082	B	0.166	4390		13.3	11.2		0.663	5.67		1.99
Duplicate of J19YJ4	J19YJ9	5/17/10	3.47		1.63	0.092	B	0.203	4500		16.3	11.1		0.813	5.96		2.44
SPA-1	J19YH7	5/17/10	1.26	B	1.70	0.212	U	0.212	6170		17.0	9.89		0.850	4.98		2.55
SPA-2	J19YH8	5/17/10	2.11		1.43	0.050	B	0.179	4580		14.3	12.3		0.717	6.44		2.15
SPA-3	J19YH9	5/17/10	2.25		1.62	0.050	B	0.203	4270		16.2	12.2		0.811	6.86		2.43
SPA-4	J19YJ0	5/17/10	1.31		1.29	0.035	B	0.161	4450		12.9	10.7		0.644	5.44		1.93
SPA-5	J19YJ1	5/17/10	2.16		1.62	0.056	B	0.202	3700		16.2	11.1		0.810	6.09		2.43
SPA-6	J19YJ2	5/17/10	6.47		1.55	0.141	B	0.194	4690		15.5	10.1		0.776	5.34		2.33
SPA-7	J19YJ3	5/17/10	2.55		1.50	0.051	B	0.187	6240		15.0	13		0.748	5.83		2,24
SPA-9	J19YJ5	5/17/10	4.16		1.26	0.104	B	0.157	4430		12.6	11.5		0.628	5.70		1.88
SPA-10	J19YJ6	5/17/10	4.84		1.40	0.105	B	0.175	3950		14.0	10.1		0.699	4.84		2.10
SPA-11	J19YJ7	5/17/10	3.03		1.40	0.083	B	0.175	4480		14.0	11.7		0.701	5.87		2.10
SPA-12	J19YJ8	5/17/10	3.32		1.27	0.091	B	0.159	5100		12.7	11.3		0.636	6.05		1.91

Attachment	1	Sheet No.	14 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	13.3		1.99	0.21	U	0.21	17300		19.9	19.3		0.993	4230		4.97
SZ-11	J19YC8	5/18/10	12.2		1.92	0.21	U	0.21	17900		19.2	7.84		0.960	5260		4.80
DZ-8	J19YD8	5/18/10	11.9		1.93	0.21	U	0.21	15500		19.3	7.78		0.967	3270		4.83
DZ-8 re-sample 1	J1FKK8	3/16/11	12.4		0.21				13100	X	3.70	19.4		0.26	3750		3.60
DZ-1	J19YD1	5/18/10	12.8		1.47	0.21	U	0.21	15500		14.7	12.5		0.737	3430		3.68
DZ-1 re-sample 1	J1FKK1	3/16/11	13.1		0.20				13900	X	3.50	11.7		0.25	4220		3.40
DZ-2	J19YD2	5/18/10	13.6		2.07	0.21	U	0.21	20400		20.7	7.09		1.03	4290		5.17
DZ-2 re-sample 1	J1FKK2	3/16/11	13.5		0.22				14700	X	3.90	12.1		0.28	3630		3.80
DZ-3	J19YD3	5/18/10	12.8		2.10	0.21	U	0.21	18600		21.0	7.83		1.05	4410		5.24
DZ-3 re-sample 1	J1FKK3	3/16/11	13.9		0.24				15500	X	4.20	10.5		0.30	5360		4.10
DZ-4	J19YD4	5/18/10	13.4		1.39	0.21	U	0.21	17500		13.9	13.1		0.696	4250		3.48
DZ-4 re-sample 1	J1FKK4	3/16/11	14.6		0.22				15300	X	3.80	7.40		0.27	3690		3.70
DZ-5	J19YD5	5/18/10	13.5		1.58	0.21	U	0.21	17800		15.8	58.2		0.788	4230		3.94
DZ-6	J19YD6	5/18/10	13.8		1.43	0.21	U	0.21	16500		14.3	15.5		0.713	4120		3.56
DZ-7	J19YD7	5/18/10	14.9		1.59	0.21	U	0.21	18300		15.9	22.8		0.794	4270		3.97
DZ-7 re-sample 1	J1FKK7	3/16/11	12.4		0.21				13200	X	3.70	24.5		0.26	3850		3.60
DZ-9	J19YD9	5/18/10	13.4		1.74	0.21	U	0.21	17800		17.4	14.4		0.870	4120		4.35
DZ-10	J19YF0	5/18/10	14.1		1.50	0.21	U	0.21	17000		15.0	12.7		0.748	3130		3.74
DZ-11	J19YF1	5/18/10	14.9		1.68	0.21	U	0.21	17400		16.8	15.8		0.842	3970		4.21
DZ-12	J19YF2	5/18/10	13.6		1.56	0.21	U	0.21	17000		15.6	14.7		0.780	4250		3.90
Duplicate of J19YD1	J19YF3	5/18/10	12.7		1.86	0.21	U	0.21	16200		18.6	14.3		0.929	3950		4.65
Duplicate of J1FKK8	J1FKL3	3/16/11	11.7		0.21				13100	X	3.70	22.7		0.26	4020		3.6
OB-8	J19YH1	5/13/10	15		1.91	0.08	B	0.20	17400		19.1	23.9		0.953	4230		4.77
SPA-8	J19YJ4	5/17/10	13.6		1.33	0.20	U	0.20	17300		13.3	56.5		0.663	3910		3.32
Duplicate of J19YJ4	J19YJ9	5/17/10	14.8		1.63	0.20	U	0.20	17800		16.3	59.8		0.813	3960		4.06
SPA-1	J19YH7	5/17/10	11.6		1.70	0.20	U	0.20	15400		17.0	4.63		0.850	3980		4.25
SPA-2	J19YH8	5/17/10	13.3		1.43	0.20	U	0.20	19900		14.3	9.70		0.717	4190		3.59
SPA-3	J19YH9	5/17/10	13.6		1.62	0.20	U	0.20	20600		16.2	9.45		0.811	4330		4.06
SPA-4	J19YJ0	5/17/10	12.2		1.29	0.20	U	0.20	16900		12.9	3.61		0.644	3880		3.22
SPA-5	J19YJ1	5/17/10	12.1		1.62	0.20	U	0.20	18000		16.2	9.15		0.810	3850		4.05
SPA-6	J19YJ2	5/17/10	15.3		1.55	0.20	U	0.20	16600		15.5	32.9		0.776	3520		3.88
SPA-7	J19YJ3	5/17/10	13.6		1.50	0.20	U	0.20	17500		15.0	19.3		0.748	4410		3.74
SPA-9	J19YJ5	5/17/10	14.1		1.26	0.20	U	0.20	17000		12.6	43.4		0.628	3890		3.14
SPA-10	J19YJ6	5/17/10	14.6		1.40	0.20	U	0.20	15300		14.0	42.8		0.699	3460		3.49
SPA-11	J19YJ7	5/17/10	12.9		1.40	0.20	U	0.20	18300		14.0	65.6		0.701	4190		3.51
SPA-12	J19YJ8	5/17/10	13.3		1.27	0.20	U	0.20	17800		12.7	87.1		0.636	3800		3.18

Attachment	1	Sheet No.	15 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	261		0.993	0.020	B	0.030	0.248	B	0.993	10.3		2.48	1070		99.3
SZ-11	J19YC8	5/18/10	258		0.960	0.027	U	0.027	0.271	B	0.960	13.4		2.40	924		96.0
DZ-8	J19YD8	5/18/10	230		0.967	0.012	B	0.030	0.248	B	0.967	8.37		2.42	821		96.7
DZ-8 re-sample 1	J1FKK8	3/16/11	219		0.097	0.0055	U	0.0055	0.250	U	0.25	9.50	X	0.12	808		39.9
DZ-1	J19YD1	5/18/10	220		0.737	0.011	B	0.030	0.213	B	0.737	7.68		1.84	769		73.7
DZ-1 re-sample 1	J1FKK1	3/16/11	217		0.091	0.0056	U	0.0056	0.370	B	0.24	12.5	X	0.11	850		37.4
DZ-2	J19YD2	5/18/10	269		1.03	0.011	B	0.030	0.288	B	1.03	12.1		2.58	658		103
DZ-2 re-sample 1	J1FKK2	3/16/11	230		0.10	0.0054	U	0.0054	0.490	B	0.27	9.40	X	0.13	829		41.9
DZ-3	J19YD3	5/18/10	259		1.05	0.012	B	0.030	0.315	B	1.05	12		2.62	978		105
DZ-3 re-sample 1	J1FKK3	3/16/11	271		0.11	0.0082	B	0.0059	0.290	U	0.29	15.4	X	0.13	1320		45.0
DZ-4	J19YD4	5/18/10	264		0.696	0.010	B	0.030	0.299	B	0.696	9.86		1.74	975		69.6
DZ-4 re-sample 1	J1FKK4	3/16/11	223		0.10	0.0052	U	0.0052	0.260	U	0.26	9.60	X	0.12	809		40.9
DZ-5	J19YD5	5/18/10	274		0.788	0.015	B	0.030	0.202	B	0.788	9.92		1.97	1110		78.8
DZ-6	J19YD6	5/18/10	251		0.713	0.009	B	0.030	0.264	B	0.713	9.93		1.78	844		71.3
DZ-7	J19YD7	5/18/10	283		0.794	0.159		0.030	0.320	B	0.794	10.4		1.98	985		79.4
DZ-7 re-sample 1	J1FKK7	3/16/11	230		0.097	0.0052	U	0.0052	0.250	U	0.25	10.1	X	0.12	843		39.9
DZ-9	J19YD9	5/18/10	247		0.870	0.025	U	0.025	0.367	B	0.870	13.7		2.18	731		87.0
DZ-10	J19YF0	5/18/10	257		0.748	0.026	U	0.026	0.239	B	0.748	7.11		1.87	735		74.8
DZ-11	J19YF1	5/18/10	262		0.842	0.026	U	0.026	0.617	B	0.842	9.14		2.10	892		84.2
DZ-12	J19YF2	5/18/10	251		0.780	0.010	B	0.030	0.262	B	0.780	9.58		1.95	840		78.0
Duplicate of J19YD1	J19YF3	5/18/10	246		0.929	0.027		0.030	0.346	B	0.929	8.62		2.32	802		92.9
Duplicate of J1FKK8	J1FKL3	3/16/11	251		0.098	0.0056	U	0.0056	0.250	U	0.25	9.90	X	0.12	780		40.0
OB-8	J19YH1	5/13/10	260		0.953	0.024	U	0.024	0.229	B	0.953	10.7		2.38	1070		95.3
SPA-8	J19YJ4	5/17/10	262		0.663	0.028	U	0.028	0.364	B	0.663	9.91		1.66	1410		66.3
Duplicate of J19YJ4	J19YJ9	5/17/10	271		0.813	0.026	U	0.026	0.401	B	0.813	10.2		2.03	1510		81.3
SPA-1	J19YH7	5/17/10	232		0.850	0.026	U	0.026	0.318	B	0.850	9.52		2.12	748		85.0
SPA-2	J19YH8	5/17/10	310		0.717	0.027	U	0.027	0.374	B	0.717	10.7		1.79	1800		71.7
SPA-3	J19YH9	5/17/10	330		0.811	0.028	U	0.028	0.331	B	0.811	10.9		2.03	1980		81.1
SPA-4	J19YJ0	5/17/10	260		0.644	0.024	U	0.024	0.282	B	0.644	10.2		1.61	1160		64.4
SPA-5	J19YJ1	5/17/10	289		0.810	0.025	U	0.025	0.338	B	0.810	10.6		2.02	1760		81.0
SPA-6	J19YJ2	5/17/10	247		0.776	0.023	B	0.030	0.495	B	0.776	9.26		1.94	1410		77.6
SPA-7	J19YJ3	5/17/10	259		0.748	0.024	U	0.024	0.344	B	0.748	12		1.87	1200		74.8
SPA-9	J19YJ5	5/17/10	257		0.628	0.015	B	0.030	0.348	B	0.628	11.2		1.57	1250		62.8
SPA-10	J19YJ6	5/17/10	226		0.699	0.057		0.030	0.377	B	0.699	9.57		1.75	1190		69.9
SPA-11	J19YJ7	5/17/10	275		0.701	0.025	U	0.025	0.304	B	0.701	10.4		1.75	1520		70.1
SPA-12	J19YJ8	5/17/10	263		0.636	0.026	U	0.026	0.312	B	0.636	10.3		1.59	1720		63.6

Attachment	1	Sheet No.	16 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	0.298	U	0.298	709		5.96	0.993	U	0.993	194		49.7	45.5		0.993
SZ-11	J19YC8	5/18/10	0.288	U	0.288	497		5.76	0.960	U	0.960	256		48.0	41.2		0.960
DZ-8	J19YD8	5/18/10	0.290	U	0.290	552		5.80	0.967	U	0.967	210		48.3	43.3		0.967
DZ-8 re-sample 1	J1FKK8	3/16/11	0.840	U	0.84	224		5.50	0.160	U	0.16	221		57.4	35.1		0.091
DZ-1	J19YD1	5/18/10	0.221	U	0.221	496		4.42	0.737	U	0.737	178		36.8	41.0		0.737
DZ-1 re-sample 1	J1FKK1	3/16/11	1.3		0.78	182	N	5.20	0.150	U	0.15	287		53.8	37.2		0.086
DZ-2	J19YD2	5/18/10	0.310	U	0.310	742		6.20	1.03	U	1.03	285		51.7	59.1		1.03
DZ-2 re-sample 1	J1FKK2	3/16/11	1.6		0.88	202		5.80	0.160	U	0.16	223		60.3	43.1		0.096
DZ-3	J19YD3	5/18/10	0.315	U	0.315	1330		6.29	1.05	U	1.05	267		52.4	47.2		1.05
DZ-3 re-sample 1	J1FKK3	3/16/11	0.940	U	0.94	305		6.20	0.180	U	0.18	240		64.7	34.6		0.10
DZ-4	J19YD4	5/18/10	0.209	U	0.209	1140		4.18	0.696	U	0.696	276		34.8	47.2		0.696
DZ-4 re-sample 1	J1FKK4	3/16/11	0.860	U	0.86	224		5.60	0.160	U	0.16	245		58.8	45.0		0.094
DZ-5	J19YD5	5/18/10	0.236	U	0.236	722		4.73	0.175	B	0.788	212		39.4	45.1		0.788
DZ-6	J19YD6	5/18/10	0.214	U	0.214	634		4.28	0.713	U	0.713	214		35.6	44.3		0.713
DZ-7	J19YD7	5/18/10	0.238	U	0.238	1190		4.76	0.794	U	0.794	247		39.7	49.3		0.794
DZ-7 re-sample 1	J1FKK7	3/16/11	0.840	U	0.84	268		5.50	0.160	U	0.16	211		57.4	32.6		0.091
DZ-9	J19YD9	5/18/10	0.261	U	0.261	507		5.22	0.870	U	0.870	221		43.5	50.2		0.870
DZ-10	J19YF0	5/18/10	0.225	U	0.225	434		4.49	0.748	U	0.748	224		37.4	48.4		0.748
DZ-11	J19YF1	5/18/10	0.253	U	0.253	565		5.05	0.842	U	0.842	245		42.1	45.8		0.842
DZ-12	J19YF2	5/18/10	0.234	U	0.234	394		4.68	0.780	U	0.780	233		39.0	44.1		0.780
Duplicate of J19YD1	J19YF3	5/18/10	0.279	U	0.279	563		5.57	0.929	U	0.929	174		46.5	45.4		0.929
Duplicate of J1FKK8	J1FKL3	3/16/11	0.840	U	0.84	208		5.50	0.160	U	0.16	217		57.6	35.2		0.092
OB-8	J19YH1	5/13/10	0.286	U	0.286	203		5.72	0.953	U	0.953	216		47.7	46.3		0.953
SPA-8	J19YJ4	5/17/10	0.199	U	0.199	433		3.98	0.145	B	0.663	183		33.2	44.8		0.663
Duplicate of J19YJ4	J19YJ9	5/17/10	0.244	U	0.244	637		4.88	0.813	U	0.813	191		40.6	46.1		0.813
SPA-1	J19YH7	5/17/10	0.255	U	0.255	362		5.10	0.85	U	0.850	173		42.5	40.9		0.850
SPA-2	J19YH8	5/17/10	0.215	U	0.215	617		4.30	0.717	U	0.717	200		35.9	47.0		0.717
SPA-3	J19YH9	5/17/10	0.243	U	0.243	753		4.87	0.811	U	0.811	203		40.6	46.3		0.811
SPA-4	J19YJ0	5/17/10	0.193	U	0.193	412		3.86	0.142	B	0.644	175		32.2	43.4		0.644
SPA-5	J19YJ1	5/17/10	0.243	U	0.243	493		4.86	0.810	U	0.810	179		40.5	41.1		0.810
SPA-6	J19YJ2	5/17/10	0.233	U	0.233	527		4.66	0.776	U	0.776	248		38.8	44.5		0.776
SPA-7	J19YJ3	5/17/10	0.224	U	0.224	535		4.49	0.748	U	0.748	220		37.4	43.7		0.748
SPA-9	J19YJ5	5/17/10	0.188	U	0.188	466		3.77	0.628	U	0.628	190		31.4	43.2		0.628
SPA-10	J19YJ6	5/17/10	0.210	U	0.210	442		4.19	0.145	B	0.699	190		34.9	39.1		0.699
SPA-11	J19YJ7	5/17/10	0.210	U	0.210	493		4.21	0.178	B	0.701	182		35.1	45.3		0.701
SPA-12	J19YJ8	5/17/10	0.191	U	0.191	457		3.82	0.157	B	0.636	191		31.8	45.0		0.636

Attachment	1	Sheet No.	17 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	35.4		2.98
SZ-11	J19YC8	5/18/10	38.3		2.88
DZ-8	J19YD8	5/18/10	34.0		2.90
DZ-8 re-sample 1	J1FKK8	3/16/11	30.8	X	0.39
DZ-1	J19YD1	5/18/10	32.6		2.21
DZ-1 re-sample 1	J1FKK1	3/16/11	31.9	X	0.36
DZ-2	J19YD2	5/18/10	38.7		3.10
DZ-2 re-sample 1	J1FKK2	3/16/11	34.1	X	0.41
DZ-3	J19YD3	5/18/10	38.2		3.15
DZ-3 re-sample 1	J1FKK3	3/16/11	40.4	X	0.44
DZ-4	J19YD4	5/18/10	36.7		2.09
DZ-4 re-sample 1	J1FKK4	3/16/11	33.6	X	0.40
DZ-5	J19YD5	5/18/10	36.7		2.36
DZ-6	J19YD6	5/18/10	33.4		2.14
DZ-7	J19YD7	5/18/10	70.2		2.38
DZ-7 re-sample 1	J1FKK7	3/16/11	41.6	X	0.39
DZ-9	J19YD9	5/18/10	36.1		2.61
DZ-10	J19YF0	5/18/10	38.0		2.25
DZ-11	J19YF1	5/18/10	41.3		2.53
DZ-12	J19YF2	5/18/10	48.8		2.34
Duplicate of J19YD1	J19YF3	5/18/10	34.6		2.79
Duplicate of J1FKK8	J1FKL3	3/16/11	33.7	X	0.39
OB-8	J19YH1	5/13/10	35.1		2.86
SPA-8	J19YJ4	5/17/10	40.0		1.99
Duplicate of J19YJ4	J19YJ9	5/17/10	41.7		2.44
SPA-1	J19YH7	5/17/10	34.0		2.55
SPA-2	J19YH8	5/17/10	38.8		2.15
SPA-3	J19YH9	5/17/10	39.9		2.43
SPA-4	J19YJ0	5/17/10	32.5		1.93
SPA-5	J19YJ1	5/17/10	37.9		2.43
SPA-6	J19YJ2	5/17/10	45.0		2.33
SPA-7	J19YJ3	5/17/10	37.9		2.24
SPA-9	J19YJ5	5/17/10	41.6		1.88
SPA-10	J19YJ6	5/17/10	38.0		2.10
SPA-11	J19YJ7	5/17/10	42.0		2.10
SPA-12	J19YJ8	5/17/10	41.2		1.91

Attachment	1	Sheet No.	18 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.184	U	0.184	0.106	U	0.106	0.701	UJ	0.814	0.075	U	0.075	0.072	U	0.072
Duplicate of J19YB9	J19YD0	5/18/10	0.096	U	0.096	0.09	U	0.09	1.2		0.938	0.076	U	0.076	0.086	U	0.086
SZ-1	J19YB8	5/18/10	0.353	U	0.353	0.101	U	0.101	0.772	UJ	0.882	0.089	U	0.089	0.102	U	0.102
SZ-3	J19YC0	5/18/10	0.129	U	0.129	0.065	U	0.065	0.773	UJ	0.799	0.104	U	0.104	0.067	U	0.067
SZ-4	J19YC1	5/18/10	0.09	U	0.09	0.071	U	0.071	0.946	J	0.802	0.067	U	0.067	0.088	U	0.088
SZ-5	J19YC2	5/18/10	0.113	U	0.113	0.112	U	0.112	0.809	UJ	0.97	0.119	U	0.119	0.112	U	0.112
SZ-6	J19YC3	5/18/10	0.324	U	0.324	0.086	U	0.086	0.603	UJ	0.893	0.06	U	0.06	0.064	U	0.064
SZ-7	J19YC4	5/18/10	0.079	U	0.079	0.074	U	0.074	0.874	J	0.805	0.059	U	0.059	0.071	U	0.071
SZ-8	J19YC5	5/18/10	0.326	U	0.326	0.094	U	0.094	0.521	UJ	0.916	0.085	U	0.085	0.096	U	0.096
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	-0.00749	U	0.136	-0.0114	U	0.0239	0.000142	U	0.463	0.0128	U	0.026	-0.00411	U	0.0253
SZ-10	J19YC7	5/18/10	0.115	U	0.115	0.051	U	0.051	0.52	UJ	0.801	0.052	U	0.052	0.064	U	0.064
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	-0.0388	U	0.119	0.0163	U	0.034	-0.0394	U	0.464	0.00519	U	0.0271	-0.00749	U	0.0237
SZ-12	J19YC9	5/18/10	0.049	U	0.049	0.019	U	0.019	0.951		0.867	0.019	U	0.019	0.019	U	0.019
DZ-1	J19YD1	5/18/10	0.074	U	0.074	0.062	U	0.062	0.718	UJ	0.918	0.069	U	0.069	0.086	U	0.086
Duplicate of J19YD1	J19YF3	5/18/10	0.091	U	0.091	0.064	U	0.064	0.903		0.883	0.074	U	0.074	0.085	U	0.085
DZ-2	J19YD2	5/18/10	0.093	U	0.093	0.107	U	0.107	0.203	UJ	0.85	0.089	U	0.089	0.082	U	0.082
DZ-3	J19YD3	5/18/10	0.367	U	0.367	0.102	U	0.102	1.23	J	0.881	0.095	U	0.095	0.108	U	0.108
DZ-4	J19YD4	5/18/10	0.329	U	0.329	0.094	U	0.094	0.534	UJ	0.841	0.078	U	0.078	0.103	U	0.103
DZ-5	J19YD5	5/18/10	0.274	U	0.274	0.083	U	0.083	0.267	UJ	0.961	0.056	U	0.056	0.068	U	0.068
DZ-6	J19YD6	5/18/10	0.313	U	0.313	0.088	U	0.088	1.15	J	0.809	0.089	U	0.089	0.087	U	0.087
DZ-7	J19YD7	5/18/10	0.313	U	0.313	0.09	U	0.09	0.725	UJ	0.83	0.594		0.087	0.145		0.076
DZ-8	J19YD8	5/18/10	0.094	U	0.094	0.064	U	0.064	0.513	UJ	0.881	0.071	U	0.071	0.086	U	0.086
DZ-9	J19YD9	5/18/10	0.117	U	0.117	0.123	U	0.123	0.581	UJ	0.86	0.114	U	0.114	0.095	U	0.095
DZ-10	J19YF0	5/18/10	0.151	U	0.151	0.055	U	0.055	0.509	UJ	0.8	0.055	U	0.055	0.072	U	0.072
DZ-11	J19YF1	5/18/10	0.169	U	0.169	0.062	U	0.062	1.41		0.901	0.066	U	0.066	0.055	U	0.055
DZ-12	J19YF2	5/18/10	0.305	U	0.305	0.096	U	0.096	0.766	U	0.9	0.078	U	0.078	0.086	U	0.086

Attachment	1	Sheet No.	19 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Nickel-63			Plutonium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.219	U	0.219	0.250	U	0.250	0.199	U	0.199	-0.391	U	3.08	0	U	0.234
Duplicate of J19YB9	J19YD0	5/18/10	0.193	U	0.193	0.274	U	0.274	0.190	U	0.190	0.357	U	2.66	0.174	U	0.277
SZ-1	J19YB8	5/18/10	0.208	U	0.208	0.351	U	0.351	0.182	U	0.182	-0.726	U	3.17	0	U	0.238
SZ-3	J19YC0	5/18/10	0.175	U	0.175	0.224	U	0.224	0.210	U	0.210	0.638	U	2.96	0.027	U	0.263
SZ-4	J19YC1	5/18/10	0.179	U	0.179	0.294	U	0.294	0.149	U	0.149	-0.971	U	3.32	-0.031	U	0.301
SZ-5	J19YC2	5/18/10	0.315	U	0.315	0.334	U	0.334	0.225	U	0.225	-1.27	U	3.22	0.022	U	0.244
SZ-6	J19YC3	5/18/10	0.155	U	0.155	0.180	U	0.180	0.168	U	0.168	-1.42	U	3.02	0	U	0.235
SZ-7	J19YC4	5/18/10	0.161	U	0.161	0.206	U	0.206	0.147	U	0.147	-0.443	U	2.9	0.078	U	0.286
SZ-8	J19YC5	5/18/10	0.199	U	0.199	0.269	U	0.269	0.178	U	0.178	-0.038	U	2.98	0.118	U	0.226
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.018	U	0.060	-0.0255	U	0.0851	0.0622	U	0.0668	-2.08	U	13.8	-0.00582	U	0.139
SZ-10	J19YC7	5/18/10	0.157	U	0.157	0.195	U	0.195	0.121	U	0.121	1.05	U	2.96	0.006	U	0.099
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	-0.024	U	0.0746	-0.0418	U	0.0849	-0.0139	U	0.0892	18.5		14.6	-0.00166	U	0.125
SZ-12	J19YC9	5/18/10	0.052	U	0.052	0.069	U	0.069	0.045	U	0.045	1.28	U	2.97	-0.094	U	0.347
DZ-1	J19YD1	5/18/10	0.174	U	0.174	0.269	U	0.269	0.135	U	0.135	-0.528	U	2.97	0.005	U	0.089
Duplicate of J19YD1	J19YF3	5/18/10	0.192	U	0.192	0.272	U	0.272	0.140	U	0.140	0.44	U	2.98	0.051	U	0.194
DZ-2	J19YD2	5/18/10	0.240	U	0.240	0.278	U	0.278	0.174	U	0.174	-0.578	U	3.03	-0.005	U	0.091
DZ-3	J19YD3	5/18/10	0.230	U	0.230	0.317	U	0.317	0.207	U	0.207	0.524	U	3.17	-0.027	U	0.087
DZ-4	J19YD4	5/18/10	0.209	U	0.209	0.249	U	0.249	0.195	U	0.195	-0.498	U	3.02	-0.005	U	0.098
DZ-5	J19YD5	5/18/10	0.162	U	0.162	0.207	U	0.207	0.184	U	0.184	0.087	U	3.44	0.017	U	0.111
DZ-6	J19YD6	5/18/10	0.182	U	0.182	0.256	U	0.256	0.169	U	0.169	-0.158	U	3.11	0.014	U	0.142
DZ-7	J19YD7	5/18/10	2.28		0.200	0.284	U	0.284	0.245	U	0.245	13.2		3.19	0.006	U	0.114
DZ-8	J19YD8	5/18/10	0.198	U	0.198	0.291	U	0.291	0.145	U	0.145	-0.232	U	3.05	0.005	U	0.047
DZ-9	J19YD9	5/18/10	0.280	U	0.280	0.340	U	0.340	0.256	U	0.256	0	U	2.96	-0.017	U	0.063
DZ-10	J19YF0	5/18/10	0.181	U	0.181	0.253	U	0.253	0.141	U	0.141	0.914	U	3	0	U	0.063
DZ-11	J19YF1	5/18/10	0.182	U	0.182	0.197	U	0.197	0.170	U	0.170	1.5	U	2.8	0.057	U	0.275
DZ-12	J19YF2	5/18/10	0.183	U	0.183	0.294	U	0.294	0.194	U	0.194	1.4	U	2.75	0.082	U	0.392

Attachment	1	Sheet No.	20 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Plutonium-239/240			Potassium-40			Radium-226			Radium-228			Silver-108 metastable		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0	U	0.234	14.6		0.54	0.683		0.148	1.17		0.266	0.062	U	0.062
Duplicate of J19YB9	J19YD0	5/18/10	0	U	0.222	13		0.676	0.670		0.154	1.09		0.371	0.058	U	0.058
SZ-1	J19YB8	5/18/10	0	U	0.238	13.1		0.746	0.493		0.166	0.638		0.365	0.064	U	0.064
SZ-3	J19YC0	5/18/10	0.027	U	0.210	13.1		0.442	0.409		0.128	0.549		0.276	0.048	U	0.048
SZ-4	J19YC1	5/18/10	0	U	0.241	15.5		0.629	0.448		0.162	0.877		0.328	0.051	U	0.051
SZ-5	J19YC2	5/18/10	0	U	0.169	13.6		1.07	0.585		0.225	0.462		0.452	0.075	U	0.075
SZ-6	J19YC3	5/18/10	-0.025	U	0.188	12.8		0.617	0.536		0.134	0.684		0.242	0.046	U	0.046
SZ-7	J19YC4	5/18/10	0.052	U	0.198	13.3		0.616	0.454		0.133	0.664		0.272	0.049	U	0.049
SZ-8	J19YC5	5/18/10	0	U	0.180	13.8		0.502	0.551		0.138	0.898		0.209	0.053	U	0.053
SZ-9	J19YC6	5/18/10	0	U	0.214	12.5		0.753	0.511		0.132	0.461		0.377	0.066	U	0.066
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	-0.00291	U	0.121										0.00194	U	0.0178
SZ-10	J19YC7	5/18/10	-0.006	U	0.071	10.9		0.531	0.344		0.112	0.424		0.255	0.041	U	0.041
SZ-11	J19YC8	5/18/10	0	U	0.234	15.6		0.392	0.684		0.08	0.868		0.17	0.029	U	0.029
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	-0.00166	U	0.125										-0.0059	U	0.0213
SZ-12	J19YC9	5/18/10	0	U	0.240	12		0.214	0.374		0.039	0.598		0.102	0.014	U	0.014
DZ-1	J19YD1	5/18/10	0.01	U	0.07	15.1		0.78	0.502		0.135	0.800		0.302	0.047	U	0.047
Duplicate of J19YD1	J19YF3	5/18/10	0	U	0.194	15.1		0.852	0.576		0.128	0.539		0.333	0.052	U	0.052
DZ-2	J19YD2	5/18/10	-0.01	U	0.057	9.42		0.79	0.425		0.165	0.349		0.338	0.061	U	0.061
DZ-3	J19YD3	5/18/10	-0.005	U	0.052	12.4		0.859	0.420		0.168	0.739		0.232	0.072	U	0.072
DZ-4	J19YD4	5/18/10	0	U	0.044	10.9		1.35	0.437		0.155	0.654		0.349	0.060	U	0.060
DZ-5	J19YD5	5/18/10	-0.006	U	0.071	11.5		0.709	0.495		0.126	0.828		0.258	0.048	U	0.048
DZ-6	J19YD6	5/18/10	0.007	U	0.055	11.0		1.05	0.505		0.154	0.571		0.314	0.055	U	0.055
DZ-7	J19YD7	5/18/10	0.028	U	0.053	12.0		0.622	0.417		0.166	0.402		0.364	0.054	U	0.054
DZ-8	J19YD8	5/18/10	-0.005	U	0.037	14.2		0.809	0.586		0.142	0.434		0.393	0.052	U	0.052
DZ-9	J19YD9	5/18/10	-0.006	U	0.044	13.2		1.06	0.619		0.24	0.98		0.438	0.082	U	0.082
DZ-10	J19YF0	5/18/10	0	U	0.039	12.4		0.609	0.402		0.111	0.551		0.293	0.047	U	0.047
DZ-11	J19YF1	5/18/10	0.086	U	0.219	13.0		0.588	0.483		0.101	0.641		0.239	0.047	U	0.047
DZ-12	J19YF2	5/18/10	0.041	U	0.313	11.5		0.61	0.490		0.15	0.373	U	0.377	0.066	U	0.066

Attachment	1	Sheet No.	21 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.036	U	0.391	0.977		0.102	1.17		0.266	-0.045	U	0.316	2.83	J	2.55
Duplicate of J19YB9	J19YD0	5/18/10	-0.043	U	0.388	0.965		0.097	1.09		0.371	-0.050	U	0.236	-0.308	U	3.15
SZ-1	J19YB8	5/18/10	0.195	U	0.398	0.528		0.149	0.638		0.365	-0.026	U	0.303	4.84	J	2.66
SZ-3	J19YC0	5/18/10	0.045	U	0.401	0.655		0.123	0.549		0.276	0.0010	U	0.277	3.97	J	2.63
SZ-4	J19YC1	5/18/10	0.185	U	0.385	0.647		0.091	0.877		0.328	-0.096	U	0.296	4.01	J	2.53
SZ-5	J19YC2	5/18/10	0.082	U	0.404	0.654		0.209	0.462		0.452	0.028	U	0.257	3.72	J	2.63
SZ-6	J19YC3	5/18/10	0.115	U	0.377	0.662		0.085	0.684		0.242	-0.036	U	0.264	4.70	J	2.78
SZ-7	J19YC4	5/18/10	0.069	U	0.363	0.546		0.087	0.664		0.272	0.012	U	0.281	5.90	J	2.59
SZ-8	J19YC5	5/18/10	0.125	U	0.389	0.63		0.107	0.898		0.209	2.4		0.242	0.994	J	2.73
SZ-9	J19YC6	5/18/10	0.133	U	0.414	0.642		0.100	0.461		0.377	-0.065	U	0.309	3.19	J	2.62
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.283	U	0.639							-0.0679	U	0.174	0.0527		0.0245
SZ-10	J19YC7	5/18/10	0.029	U	0.387	0.49		0.071	0.424		0.255	-0.077	U	0.251	3.75	J	2.64
SZ-11	J19YC8	5/18/10	-0.091	U	0.37	0.73		0.055	0.868		0.17	0.113	U	0.235	0.097	U	2.99
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.467	U	0.644							-0.0415	U	0.193	0.0530		0.0137
SZ-12	J19YC9	5/18/10	-0.021	U	0.394	0.499		0.025	0.598		0.102	-0.0050	U	0.252	-0.774	U	2.97
DZ-1	J19YD1	5/18/10	0.13	U	0.382	0.668		0.086	0.800		0.302	-0.051	U	0.226	4.53	J	2.71
Duplicate of J19YD1	J19YF3	5/18/10	-0.086	U	0.39	0.731		0.086	0.539		0.333	-0.084	U	0.217	0.202	U	3.10
DZ-2	J19YD2	5/18/10	0.175	U	0.434	0.505		0.105	0.349		0.338	-0.060	U	0.291	2.13	UJ	2.60
DZ-3	J19YD3	5/18/10	0.289	U	0.424	0.876		0.163	0.739		0.232	0.194	U	0.326	1.79	UJ	2.58
DZ-4	J19YD4	5/18/10	0.166	U	0.375	0.586		0.147	0.654		0.349	0.059	U	0.257	2.55	UJ	2.64
DZ-5	J19YD5	5/18/10	0.146	U	0.492	0.586		0.087	0.828		0.258	0.071	U	0.311	1.72	UJ	2.76
DZ-6	J19YD6	5/18/10	0.194	U	0.384	0.544		0.091	0.571		0.314	0.051	U	0.244	2.32	UJ	2.55
DZ-7	J19YD7	5/18/10	0.114	U	0.37	0.613		0.090	0.402		0.364	-0.065	U	0.285	4.34	J	2.59
DZ-8	J19YD8	5/18/10	0.227	U	0.442	0.691		0.088	0.434		0.393	0.012	U	0.266	1.06	UJ	2.65
DZ-9	J19YD9	5/18/10	0.15	U	0.387	0.557		0.147	0.980		0.438	-0.110	U	0.324	1.91	UJ	2.62
DZ-10	J19YF0	5/18/10	-0.013	U	0.408	0.607		0.075	0.551		0.293	-0.053	U	0.272	2.53	J	2.53
DZ-11	J19YF1	5/18/10	-0.029	U	0.385	0.750		0.126	0.641		0.239	-0.020	U	0.228	1.06	U	2.96
DZ-12	J19YF2	5/18/10	0.012	U	0.400	0.615		0.175	0.373	U	0.377	0.0060	U	0.207	0.297	U	3.03

Attachment	1	Sheet No.	22 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.77		0.226	0	U	0.274	0.439	U	0.439	0.681		0.226	8.59	U	8.59
Duplicate of J19YB9	J19YD0	5/18/10	0.930		0.178	0.084	U	0.215	0.405	U	0.405	0.768		0.178	9.41	U	9.41
SZ-1	J19YB8	5/18/10	0.266		0.157	0.050	U	0.190	0.435	U	0.435	0.225		0.157	11.2	U	11.2
SZ-3	J19YC0	5/18/10	0.395		0.233	0	U	0.282	0.301	U	0.301	0.426		0.233	7.38	U	7.38
SZ-4	J19YC1	5/18/10	0.326		0.226	0.036	U	0.274	0.388	U	0.388	0.444		0.226	10.4	U	10.4
SZ-5	J19YC2	5/18/10	0.811		0.222	0.035	U	0.268	0.538	U	0.538	0.753		0.222	14.2	U	14.2
SZ-6	J19YC3	5/18/10	0.739		0.202	0.064	U	0.244	0.378	U	0.378	0.739		0.202	7.18	U	7.18
SZ-7	J19YC4	5/18/10	0.594		0.216	0	U	0.262	0.335	U	0.335	0.678		0.216	7.21	U	7.21
SZ-8	J19YC5	5/18/10	0.724		0.213	0	U	0.258	0.423	U	0.423	0.669		0.213	10.0	U	10.0
SZ-9	J19YC6	5/18/10	0.575		0.259	0.041	U	0.314	0.380	U	0.380	0.542		0.259	10.4	U	10.4
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.0792	U	0.114	-0.00137	U	0.102				0.214		0.123			
SZ-10	J19YC7	5/18/10	0.609		0.245	0.039	U	0.297	0.244	U	0.244	0.833		0.245	6.37	U	6.37
SZ-11	J19YC8	5/18/10	0.688		0.176	0.028	U	0.213	0.200	U	0.200	0.551		0.176	4.10	U	4.10
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.196		0.123	-0.00163	U	0.123				0.454		0.137			
SZ-12	J19YC9	5/18/10	0.552		0.156	0.025	U	0.189	0.106	U	0.106	0.368		0.156	2.31	U	2.31
DZ-1	J19YD1	5/18/10	0.766		0.279	0	U	0.338	0.336	U	0.336	0.620		0.279	7.78	U	7.78
Duplicate of J19YD1	J19YF3	5/18/10	0.567		0.181	0	U	0.219	0.372	U	0.372	0.543		0.181	9.63	U	9.63
DZ-2	J19YD2	5/18/10	0.318		0.244	0	U	0.295	0.420	U	0.420	0.510		0.244	10.0	U	10.0
DZ-3	J19YD3	5/18/10	0.380		0.242	0	U	0.293	0.467	U	0.467	0.570		0.242	11.8	U	11.8
DZ-4	J19YD4	5/18/10	0.395		0.202	0.064	U	0.244	0.391	U	0.391	0.501		0.202	11.1	U	11.1
DZ-5	J19YD5	5/18/10	0.870		0.215	0.136	U	0.26	0.355	U	0.355	0.533		0.215	7.77	U	7.77
DZ-6	J19YD6	5/18/10	0.702		0.244	0.039	U	0.296	0.340	U	0.340	0.766		0.244	9.78	U	9.78
DZ-7	J19YD7	5/18/10	0.648		0.236	0	U	0.286	0.432	U	0.432	0.833		0.236	9.63	U	9.63
DZ-8	J19YD8	5/18/10	0.430		0.206	0.033	U	0.249	0.340	U	0.340	0.349		0.206	10.5	U	10.5
DZ-9	J19YD9	5/18/10	0.709		0.209	0.066	U	0.253	0.598	U	0.598	0.546		0.209	12.7	U	12.7
DZ-10	J19YF0	5/18/10	0.594		0.182	0	U	0.22	0.326	U	0.326	0.570		0.182	6.66	U	6.66
DZ-11	J19YF1	5/18/10	0.371		0.149	0	U	0.181	0.371	U	0.371	0.488		0.149	7.59	U	7.59
DZ-12	J19YF2	5/18/10	0.553		0.184	0	U	0.223	0.390	U	0.390	0.481		0.184	9.86	U	9.86

Attachment	1	Sheet No.	23 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.322	U	0.322	0.088	U	0.088	0.663	U	0.866	0.076	U	0.076	0.086	U	0.086
Duplicate of J19YF8	J19YH6	5/13/10	0.092	U	0.092	0.076	U	0.076	0.91	U	0.933	0.076	U	0.076	0.086	U	0.086
OB-1	J19YF4	5/13/10	0.088	U	0.088	0.08	U	0.08	0.576	U	0.674	0.078	U	0.078	0.082	U	0.082
OB-2	J19YF5	5/13/10	0.189	U	0.189	0.088	U	0.088	0.872	U	0.968	0.062	U	0.062	0.063	U	0.063
OB-3	J19YF6	5/13/10	0.155	U	0.155	0.065	U	0.065	0.145	U	0.982	0.057	U	0.057	0.045	U	0.045
OB-4	J19YF7	5/13/10	0.115	U	0.115	0.115	U	0.115	1.54		0.92	0.107	U	0.107	0.098	U	0.098
OB-6	J19YF9	5/13/10	0.084	U	0.084	0.084	U	0.084	1.24		0.89	0.076	U	0.076	0.077	U	0.077
OB-7	J19YH0	5/13/10	0.080	U	0.080	0.065	U	0.065	1.24		0.917	0.064	U	0.064	0.063	U	0.063
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.00932	U	0.0535	0.0144	U	0.0345	-0.0486	U	0.451	-0.00478	U	0.0298	0.0183	U	0.0346
OB-9	J19YH2	5/13/10	0.327	U	0.327	0.096	U	0.096	1.49		0.882	0.068	U	0.068	0.059	U	0.059
OB-10	J19YH3	5/13/10	0.169	U	0.169	0.08	U	0.08	1.02		0.904	0.066	U	0.066	0.063	U	0.063
OB-11	J19YH4	5/13/10	0.144	U	0.144	0.066	U	0.066	0.261	U	0.882	0.07	U	0.07	0.064	U	0.064
OB-12	J19YH5	5/13/10	0.11	U	0.11	0.11	U	0.11	0.43	U	0.943	0.108	U	0.108	0.1	U	0.1
OB-13	J1B4H9	5/17/10	0.064	U	0.064	0.032	U	0.032	0.051	U	0.513	0.036	U	0.036	0.02	U	0.02
OB-14	J1B4J0	5/17/10	0.066	U	0.066	0.059	U	0.059	0.063	U	0.511	0.056	U	0.056	0.063	U	0.063
OB-15	J1B4J1	5/17/10	0.124	U	0.124	0.064	U	0.064	-0.251	U	0.526	0.051	U	0.051	0.044	U	0.044
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	-0.039	U	0.0841	-0.00873	U	0.0854	-0.111	U	0.451	-0.0328	U	0.080	0.0179	U	0.0926
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	-0.0217	U	0.060	0.00758	U	0.060	0.101	U	0.449	0.0326	U	0.0608	0.00354	U	0.0733
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	-0.0570	U	0.147	0.000485	U	0.0237	-0.147	U	0.450	0.0180	U	0.0258	0.00260	U	0.0277
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	-0.0572	U	0.102	-0.00127	U	0.0358	0.0345	U	0.450	-0.00760	U	0.0341	0.00647	U	0.0366
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.0308	U	0.119	0.0276	U	0.0339	0.0399	U	0.450	-0.00482	U	0.0262	-0.000687	U	0.0246
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	-0.0244	U	0.183	-0.0036	U	0.0841	-0.0225	U	0.448	0.0528	U	0.0969	-0.0159	U	0.0789
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	-0.0974	U	0.221	0.0144	U	0.0420	0.0136	U	0.450	0.0515	U	0.0571	0.00491	U	0.0475
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.00323	U	0.126	0.0253	U	0.0356	0.298	U	0.450	0.0679		0.0285	-0.000156	U	0.0269
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	-0.000684	U	0.0531	-0.00388	U	0.0345	0.247	U	0.449	-0.00511	U	0.0279	-0.00386	U	0.0301
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	-0.0178	U	0.152	0.00169	U	0.0388	0.013	U	0.451	-0.0167	U	0.0322	-0.00777	U	0.0309
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	-0.00934	U	0.106	-0.00819	U	0.0342	0.0793	U	0.451	-0.00722	U	0.0312	-0.00823	U	0.0323
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.0161	U	0.0633	-0.00795	U	0.0377	0.0241	U	0.450	-0.0125	U	0.0343	0.00316	U	0.0340
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	-0.0546	U	0.143	0.0104	U	0.0242	0.0821	U	0.452	0.0167	U	0.0248	-0.0123	U	0.0232

Attachment	1	Sheet No.	24 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Nickel-63			Plutonium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.175	U	0.175	0.305	U	0.305	0.185	U	0.185	-0.447	U	3.29	-0.056	U	0.269
Duplicate of J19YF8	J19YH6	5/13/10	0.198	U	0.198	0.262	U	0.262	0.151	U	0.151	0.122	U	3.28	0.03	U	0.23
OB-1	J19YF4	5/13/10	0.160	U	0.160	0.256	U	0.256	0.154	U	0.154	-0.475	U	3.49	0.024	U	0.227
OB-2	J19YF5	5/13/10	0.177	U	0.177	0.212	U	0.212	0.168	U	0.168	-0.354	U	3.58	0.267		0.227
OB-3	J19YF6	5/13/10	0.170	U	0.170	0.231	U	0.231	0.138	U	0.138	1.22	U	3.41	-0.056	U	0.267
OB-4	J19YF7	5/13/10	0.260	U	0.260	0.314	U	0.314	0.220	U	0.220	0.342	U	3.46	0	U	0.332
OB-6	J19YF9	5/13/10	0.160	U	0.160	0.245	U	0.245	0.155	U	0.155	-0.341	U	3.45	-0.058	U	0.322
OB-7	J19YH0	5/13/10	0.158	U	0.158	0.207	U	0.207	0.132	U	0.132	-0.419	U	3.39	0.023	U	0.224
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.0432	U	0.0774	-0.0353	U	0.0992	0.0820	U	0.0773	0.364	U	13.5	0.0395	U	0.148
OB-9	J19YH2	5/13/10	0.169	U	0.169	0.205	U	0.205	0.189	U	0.189	-0.121	U	3.27	1.46		0.298
OB-10	J19YH3	5/13/10	0.158	U	0.158	0.166	U	0.166	0.176	U	0.176	0.342	U	3.46	-0.024	U	0.180
OB-11	J19YH4	5/13/10	0.169	U	0.169	0.22	U	0.22	0.148	U	0.148	-0.36	U	3.24	-0.022	U	0.170
OB-12	J19YH5	5/13/10	0.242	U	0.242	0.301	U	0.301	0.201	U	0.201	-0.237	U	3.2	0	U	0.185
OB-13	J1B4H9	5/17/10	0.067	U	0.067	0.07	U	0.07	0.065	U	0.065	-0.185	U	2.8	0.037	U	0.282
OB-14	J1B4J0	5/17/10	0.132	U	0.132	0.170	U	0.170	0.120	U	0.120	1.61	U	3.12	-0.055	U	0.262
OB-15	J1B4J1	5/17/10	0.142	U	0.142	0.163	U	0.163	0.124	U	0.124	0.797	U	3.17	0	U	0.242
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.0133	U	0.19	0.0174	U	0.279	0.00650	U	0.139	2.88	U	13.7	-0.00601	U	0.144
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0315	U	0.142	0.0430	U	0.216	0.0503	U	0.0970	1.71	U	13.6	0.0284	U	0.107
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	-0.00782	U	0.0570	0.00821	U	0.0841	0.0574	U	0.0674	1.47	U	12.8	0	U	0.131
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	-0.0164	U	0.0798	-0.0137	U	0.113	0.0727	U	0.0855	3.23	U	12.3	0.0523	U	0.196
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.0155	U	0.0745	-0.0515	U	0.0864	-0.00494	U	0.0883	-0.318	U	12.2	0	U	0.171
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.00384	U	0.198	0.0477	U	0.274	0.0990	U	0.163	0.313	U	13.3	-0.00196	U	0.147
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0258	U	0.0974	0.00254	U	0.169	0.0255	U	0.0921	-1.31	U	12.3	-0.00155	U	0.116
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	-0.00760	U	0.0743	-0.00187	U	0.087	0.0387	U	0.0964	-1.96	U	13.5	0.0324	U	0.128
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.0126	U	0.0769	0.0108	U	0.099	0.0332	U	0.0751	0.329	U	14.0	-0.00471	U	0.141
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	-0.0923	U	0.0831	-0.0761	U	0.0927	0.00794	U	0.111	-2.08	U	11.9	-0.00179	U	0.133
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	-0.0122	U	0.0809	0.0410	U	0.109	-0.00152	U	0.0807	0.888	U	12.6	0	U	0.144
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	-0.0124	U	0.0931	0.00292	U	0.111	0.0284	U	0.0915	1.96	U	12.8	0	U	0.140
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	-0.0341	U	0.0532	-0.00577	U	0.0788	0.0495	U	0.0675	3.14	U	13.8	-0.00170	U	0.127

Attachment	1	Sheet No.	25 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Plutonium-239/240			Potassium-40			Radium-226			Radium-228			Silver-108 metastable		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.028	U	0.215	12.9		0.766	0.410		0.170	0.619		0.346	0.061	U	0.061
Duplicate of J19YF8	J19YH6	5/13/10	0.03	U	0.230	14.6		1.16	0.488		0.175	1.00		0.326	0.053	U	0.053
OB-1	J19YF4	5/13/10	0.047	U	0.181	12.3		0.865	0.392		0.135	0.681		0.222	0.060	U	0.060
OB-2	J19YF5	5/13/10	0	U	0.227	12.2		0.803	0.386		0.128	0.642		0.285	0.050	U	0.050
OB-3	J19YF6	5/13/10	-0.028	U	0.213	12.2		0.586	0.335		0.122	0.790		0.177	0.046	U	0.046
OB-4	J19YF7	5/13/10	-0.035	U	0.265	14.8		1.08	0.499		0.173	0.856		0.430	0.082	U	0.082
OB-6	J19YF9	5/13/10	0.058	U	0.223	13		0.704	0.444		0.124	0.902		0.282	0.056	U	0.056
OB-7	J19YH0	5/13/10	0	U	0.179	15.2		0.671	0.503		0.143	0.783		0.306	0.047	U	0.047
OB-8	J19YH1	5/13/10	0	U	0.201	11.4		0.642	0.430		0.107	0.673		0.285	0.043	U	0.043
OB-8 re-sample 1[a]	J1FKL6	3/17/11	-0.00397	U	0.165										-0.00434	U	0.0230
OB-9	J19YH2	5/13/10	0.027	U	0.206	12.7		0.689	0.388		0.143	0.472		0.308	0.053	U	0.053
OB-10	J19YH3	5/13/10	0	U	0.180	13.5		0.482	0.418		0.124	0.625		0.210	0.053	U	0.053
OB-11	J19YH4	5/13/10	0	U	0.170	13		0.662	0.505		0.106	1.08		0.210	0.048	U	0.048
OB-12	J19YH5	5/13/10	0	U	0.185	11.6		0.964	0.338		0.162	0.397	U	0.411	0.072	U	0.072
OB-13	J1B4H9	5/17/10	0	U	0.282	13.3		0.215	0.439		0.041	0.637		0.088	0.018	U	0.018
OB-14	J1B4J0	5/17/10	0	U	0.209	13.5		0.576	0.486		0.111	0.847		0.200	0.042	U	0.042
OB-15	J1B4J1	5/17/10	0.0	U	0.242	13		0.434	0.437		0.097	0.794		0.220	0.039	U	0.039
SPA-4	J19YJ0	5/17/10	0.108	U	0.277	12.4		0.709	0.390		0.116	0.557		0.282	0.051	U	0.051
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	-0.00300	U	0.125										0.0143	U	0.065
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0	U	0.107										0.0114	U	0.0461
SPA-1	J19YH7	5/17/10	0.028	U	0.215	12.7		0.574	0.404		0.095	0.608		0.231	0.046	U	0.046
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	-0.00176	U	0.131										0.00263	U	0.0175
SPA-2	J19YH8	5/17/10	0.033	U	0.255	14.8		1.08	0.505		0.239	0.818		0.451	0.080	U	0.080
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0	U	0.196										0.00455	U	0.0249
SPA-3	J19YH9	5/17/10	0.0	U	0.300	15.6		1.11	0.689		0.168	0.842		0.466	0.054	U	0.054
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0	U	0.171										-0.00180	U	0.0226
SPA-5	J19YJ1	5/17/10	0.0	U	0.373	12.3		0.885	0.565		0.109	1.03		0.280	0.053	U	0.053
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	-0.00196	U	0.147										-0.00601	U	0.0637
SPA-6	J19YJ2	5/17/10	0.032	U	0.248	12.3		1.09	0.494		0.205	1.05		0.518	0.092	U	0.092
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	-0.00155	U	0.116										0.00246	U	0.0294
SPA-7	J19YJ3	5/17/10	-0.041	U	0.316	15.6		0.834	0.395		0.138	0.775		0.256	0.047	U	0.047
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0666	U	0.128										-0.00435	U	0.0228
SPA-8	J19YJ4	5/17/10	0	U	0.285	12.3		0.628	0.506		0.140	0.500		0.255	0.054	U	0.054
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.0282	U	0.131										-0.00839	U	0.0228
SPA-9	J19YJ5	5/17/10	0.037	U	0.283	11.8		0.881	0.370		0.159	0.736		0.363	0.056	U	0.056
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0	U	0.133										-0.000774	U	0.028
SPA-10	J19YJ6	5/17/10	0	U	0.302	14.1		1.07	0.832		0.213	1.06		0.474	0.082	U	0.082
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	-0.00384	U	0.160										0.00951	U	0.0267
SPA-11	J19YJ7	5/17/10	0	U	0.247	12.9		0.258	0.496		0.048	0.676		0.098	0.017	U	0.017
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0	U	0.140										0.00815	U	0.0306
SPA-12	J19YJ8	5/17/10	0	U	0.258	14.6		0.43	0.551		0.085	0.750		0.178	0.032	U	0.032
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	-0.00340	U	0.142										-0.00141	U	0.0169
Duplicate of J19YJ4	J19YJ9	5/17/10	0	U	0.267	15.7		0.301	0.567		0.057	0.829		0.137	0.019	U	0.019

Attachment	1	Sheet No.	26 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.003	U	0.383	0.706		0.118	0.619		0.346	-0.031	U	0.231	1.61	U	2.42
Duplicate of J19YF8	J19YH6	5/13/10	0.156	U	0.372	0.944		0.135	1.00		0.326	-0.1	U	0.259	1.88	U	2.6
OB-1	J19YF4	5/13/10	0.071	U	0.385	0.48		0.082	0.681		0.222	-0.046	U	0.204	0.746	U	2.51
OB-2	J19YF5	5/13/10	0.097	U	0.409	0.608		0.125	0.642		0.285	-0.094	U	0.224	2.93		2.68
OB-3	J19YF6	5/13/10	0.124	U	0.381	0.565		0.07	0.79		0.177	0.062	U	0.240	3.04		2.74
OB-4	J19YF7	5/13/10	0.125	U	0.396	0.651		0.224	0.856		0.43	0.01	U	0.214	3.61		2.67
OB-6	J19YF9	5/13/10	0.032	U	0.385	0.845		0.123	0.902		0.282	0.026	U	0.221	0.975	U	2.5
OB-7	J19YH0	5/13/10	0.214	U	0.37	0.644		0.078	0.783		0.306	0.089	U	0.249	2.78		2.59
OB-8	J19YH1	5/13/10	0.004	U	0.452	0.62		0.075	0.673		0.285	-0.051	U	0.291	3.09		2.68
OB-8 re-sample 1[a]	J1FKL6	3/17/11	-0.0128	U	0.642							0.0560	U	0.186	0.00188	U	0.0264
OB-9	J19YH2	5/13/10	0.124	U	0.390	0.651		0.11	0.472		0.308	-0.054	U	0.228	2.22	U	2.44
OB-10	J19YH3	5/13/10	0.005	U	0.380	0.586		0.126	0.625		0.210	-0.019	U	0.225	2.61		2.56
OB-11	J19YH4	5/13/10	0.029	U	0.363	0.738		0.091	1.08		0.210	0.089	U	0.261	0.916	U	2.47
OB-12	J19YH5	5/13/10	0.087	U	0.394	0.530		0.133	0.397	U	0.411	-0.028	U	0.241	0.68	U	2.62
OB-13	J1B4H9	5/17/10	0.087	U	0.443	0.565		0.034	0.637		0.088	-0.096	U	0.356	-0.998	U	7.04
OB-14	J1B4J0	5/17/10	0.082	U	0.419	0.598		0.071	0.847		0.200	-0.052	U	0.305	-1.09	U	7.68
OB-15	J1B4J1	5/17/10	0.059	U	0.443	0.646		0.069	0.794		0.220	-0.001	U	0.348	-2.07	U	7.28
SPA-4	J19YJ0	5/17/10	0.082	U	0.418	0.564		0.094	0.557		0.282	0.088	U	0.325	-1.24	U	7.16
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.165	U	0.607							0.0938	U	0.171	0.00250	U	0.0166
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.177	U	0.626							0.0251	U	0.170	-0.00206	U	0.0161
SPA-1	J19YH7	5/17/10	0.048	U	0.453	0.455		0.064	0.608		0.231	0.013	U	0.289	1.42	U	7.50
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.403	U	0.625							0.0850	U	0.171	0.000742	U	0.0166
SPA-2	J19YH8	5/17/10	0.130	U	0.462	0.525		0.217	0.818		0.451	0.007	U	0.313	-0.359	U	7.59
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.288	U	0.624							0.0101	U	0.167	0.00638	U	0.0156
SPA-3	J19YH9	5/17/10	0.181	U	0.420	1.04		0.108	0.842		0.466	0.053	U	0.265	-2.56	U	7.38
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.520	U	0.617							0.0241	U	0.154	0.00375	U	0.0153
SPA-5	J19YJ1	5/17/10	0.086	U	0.399	0.927		0.137	1.03		0.280	-0.028	U	0.244	-2.27	U	8.46
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.397	U	0.621							0.0856	U	0.178	0.00266	U	0.0248
SPA-6	J19YJ2	5/17/10	0.195	U	0.428	0.687		0.134	1.05		0.518	-0.038	U	0.317	2.46	U	7.44
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.256	U	0.618							0.0207	U	0.173	0.0113	U	0.0278
SPA-7	J19YJ3	5/17/10	0.034	U	0.435	0.697		0.097	0.775		0.256	-0.067	U	0.314	-1.83	U	8.27
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.439	U	0.650							0.0345	U	0.170	0.0167	U	0.0237
SPA-8	J19YJ4	5/17/10	0.012	U	0.420	0.573		0.079	0.500		0.255	0.122	U	0.327	-0.83	U	7.52
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.485	U	0.615							0.0396	U	0.173	0.00300	U	0.0241
SPA-9	J19YJ5	5/17/10	0.086	U	0.417	0.693		0.098	0.736		0.363	0.033	U	0.290	1.25	U	8.79
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.237	U	0.645							0.0531	U	0.173	0.00601	U	0.0336
SPA-10	J19YJ6	5/17/10	0.144	U	0.426	0.666		0.154	1.06		0.474	0.004	U	0.328	-1.06	U	7.45
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.427	U	0.633							0.0381	U	0.166	0.00556	U	0.0140
SPA-11	J19YJ7	5/17/10	0.056	U	0.444	0.7		0.031	0.676		0.098	0.074	U	0.332	-1.64	U	7.42
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.575	U	0.615							0.110	U	0.167	0.00634	U	0.0126
SPA-12	J19YJ8	5/17/10	-0.015	U	0.430	0.756		0.057	0.75		0.178	0.049	U	0.364	-1.72	U	7.77
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.809		0.656							0.0884	U	0.172	0.00631	U	0.0206
Duplicate of J19YJ4	J19YJ9	5/17/10	0.028	U	0.404	0.831		0.036	0.829		0.137	0.013	U	0.296	0.457	U	7.26

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.517		0.172	0.027	U	0.208	0.351	U	0.351	0.427		0.172	12.3	U	12.3
Duplicate of J19YF8	J19YH6	5/13/10	0.579		0.201	0.032	U	0.244	0.432	U	0.432	0.526		0.201	8.91	U	8.91
OB-1	J19YF4	5/13/10	0.541		0.138	0.044	U	0.167	0.337	U	0.337	0.559		0.138	9.69	U	9.69
OB-2	J19YF5	5/13/10	0.494		0.169	0.064	U	0.163	0.425	U	0.425	0.459		0.135	7.07	U	7.07
OB-3	J19YF6	5/13/10	0.401		0.161	0.051	U	0.195	0.329	U	0.329	0.527		0.161	8.15	U	8.15
OB-4	J19YF7	5/13/10	0.598		0.148	0.047	U	0.179	0.626	U	0.626	0.444		0.148	11.9	U	11.9
OB-6	J19YF9	5/13/10	0.620		0.250	0.119	U	0.302	0.376	U	0.376	0.588		0.250	8.91	U	8.91
OB-7	J19YH0	5/13/10	0.558		0.194	0	U	0.235	0.295	U	0.295	0.660		0.194	7.88	U	7.88
OB-8	J19YH1	5/13/10	0.404		0.206	0.033	U	0.249	0.317	U	0.317	0.592		0.206	7.17	U	7.17
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.138	U	0.177	-0.0119	U	0.154				0.186	U	0.191			
OB-9	J19YH2	5/13/10	0.482		0.194	0.061	U	0.235	0.429	U	0.429	0.508		0.194	8.98	U	8.98
OB-10	J19YH3	5/13/10	0.632		0.186	0.029	U	0.225	0.39	U	0.39	0.292		0.186	7.69	U	7.69
OB-11	J19YH4	5/13/10	0.464		0.209	0.066	U	0.253	0.359	U	0.359	0.628		0.209	7.92	U	7.92
OB-12	J19YH5	5/13/10	0.760		0.224	0.035	U	0.271	0.490	U	0.490	0.731		0.224	11.6	U	11.6
OB-13	J1B4H9	5/17/10	0.495		0.223	0.035	U	0.270	0.144	U	0.144	0.524		0.223	2.6	U	2.6
OB-14	J1B4J0	5/17/10	0.778		0.161	0.051	U	0.195	0.284	U	0.284	0.421		0.161	5.59	U	5.59
OB-15	J1B4J1	5/17/10	-0.008	U	0.046	0.005	U	0.039	0.296	U	0.296	0.013	U	0.032	5.68	U	5.68
SPA-4	J19YJ0	5/17/10	0.366		0.280	0.133	U	0.339	0.370	U	0.370	0.44		0.28	7.81	U	7.81
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.127		0.120	-0.00158	U	0.101				0.0772	U	0.101			
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0580	U	0.139	0.0162	U	0.122				0.236		0.163			
SPA-1	J19YH7	5/17/10	0.236		0.164	0.052	U	0.198	0.302	U	0.302	0.279		0.164	7.01	U	7.01
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.218		0.142	-0.00464	U	0.111				0.174		0.135			
SPA-2	J19YH8	5/17/10	0.552		0.264	0	U	0.32	0.529	U	0.529	0.345		0.264	12.6	U	12.6
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.043	U	0.105	0	U	0.0873				0.115		0.0873			
SPA-3	J19YH9	5/17/10	0.32		0.204	0.065	U	0.247	0.421	U	0.421	0.427		0.204	10.4	U	10.4
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.162		0.0870	-0.00116	U	0.087				0.160		0.0970			
SPA-5	J19YJ1	5/17/10	0.488		0.208	0.033	U	0.251	0.359	U	0.359	0.38		0.208	8.44	U	8.44
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.138		0.130	0.0551	U	0.109				0.0244	U	0.126			
SPA-6	J19YJ2	5/17/10	0.474		0.202	0.064	U	0.244	0.576	U	0.576	0.791		0.202	12.5	U	12.5
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.141	U	0.154	-0.00773	U	0.135				0.132	U	0.180			
SPA-7	J19YJ3	5/17/10	1.01		0.257	0	U	0.312	0.373	U	0.373	0.774		0.257	8.73	U	8.73
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0757	U	0.147	-0.00560	U	0.134				0.130	U	0.153			
SPA-8	J19YJ4	5/17/10	0.85		0.21	0.033	U	0.254	0.413	U	0.413	0.302		0.21	8.54	U	8.54
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.207		0.119	0	U	0.0988				0.183		0.0988			
SPA-9	J19YJ5	5/17/10	0.497		0.055	0.024	U	0.044	0.380	U	0.380	0.491		0.036	9.02	U	9.02
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.453		0.106	0.0494	U	0.095				0.224		0.114			
SPA-10	J19YJ6	5/17/10	0.436		0.052	0.005	U	0.039	0.551	U	0.551	0.428		0.047	11.4	U	11.4
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.187		0.100	-0.00133	U	0.1				0.211		0.112			
SPA-11	J19YJ7	5/17/10	0.496		0.158	0.05	U	0.191	0.145	U	0.145	0.393		0.158	2.76	U	2.76
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.141		0.111	-0.00145	U	0.0931				0.0711	U	0.0931			
SPA-12	J19YJ8	5/17/10	0.692		0.165	0	U	0.2	0.203	U	0.203	0.346		0.165	4.64	U	4.64
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.0717	U	0.178	0.0756	U	0.150				0.189		0.173			
Duplicate of J19YJ4	J19YJ9	5/17/10	0.33		0.194	0.031	U	0.235	0.148	U	0.148	0.635		0.194	4.79	U	4.79

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.269	U	0.269	0.095	U	0.095	0.791	UJ	0.865	0.08	U	0.08	0.085	U	0.085
SZ-11	J19YC8	5/18/10	0.042	U	0.042	0.042	U	0.042	1.24		0.903	0.062	U	0.062	0.033	U	0.033
OB-8	J19YH1	5/13/10	0.149	U	0.149	0.053	U	0.053	0.472	U	0.982	0.063	U	0.063	0.058	U	0.058
SPA-4	J19YJ0	5/17/10	0.178	U	0.178	0.079	U	0.079	-0.029	U	0.489	0.100	U	0.1	0.057	U	0.057
SPA-1	J19YH7	5/17/10	0.124	U	0.124	0.054	U	0.054	-0.091	U	0.496	0.065	U	0.065	0.062	U	0.062
SPA-2	J19YH8	5/17/10	0.12	U	0.12	0.121	U	0.121	-0.085	U	0.534	0.253	U	0.253	0.112	U	0.112
SPA-3	J19YH9	5/17/10	0.107	U	0.107	0.083	U	0.083	0.136	U	0.51	0.234		0.092	0.094	U	0.094
SPA-5	J19YJ1	5/17/10	0.159	U	0.159	0.067	U	0.067	-0.014	U	0.525	0.110		0.077	0.078	U	0.078
SPA-6	J19YJ2	5/17/10	0.128	U	0.128	0.13	U	0.13	0.145	U	0.519	0.307		0.132	0.114	U	0.114
SPA-7	J19YJ3	5/17/10	0.085	U	0.085	0.067	U	0.067	-0.038	U	0.507	0.069	U	0.069	0.081	U	0.081
SPA-8	J19YJ4	5/17/10	0.321	U	0.321	0.098	U	0.098	0.039	U	0.51	0.118	U	0.118	0.067	U	0.067
SPA-9	J19YJ5	5/17/10	0.089	U	0.089	0.092	U	0.092	0.048	U	0.515	0.238		0.09	0.084	U	0.084
SPA-10	J19YJ6	5/17/10	0.115	U	0.115	0.116	U	0.116	0.141	U	0.502	0.333		0.119	0.092	U	0.092
SPA-11	J19YJ7	5/17/10	0.052	U	0.052	0.023	U	0.023	-0.003	U	0.522	0.056		0.028	0.025	U	0.025
SPA-12	J19YJ8	5/17/10	0.045	U	0.045	0.044	U	0.044	-0.046	U	0.503	0.089		0.048	0.039	U	0.039
Duplicate of J19YJ4	J19YJ9	5/17/10	0.035	U	0.035	0.026	U	0.026	-0.064	U	0.497	0.136		0.036	0.031	U	0.031

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Nickel-63			Plutonium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.214	U	0.214	0.299	U	0.299	0.187	U	0.187	-0.352	U	3.08	0	U	0.214
SZ-11	J19YC8	5/18/10	0.098	U	0.098	0.113	U	0.113	0.091	U	0.091	1.73	U	2.86	0	U	0.292
OB-8	J19YH1	5/13/10	0.141	U	0.141	0.195	U	0.195	0.137	U	0.137	-1.38	U	3.28	-0.053	U	0.29
SPA-4	J19YJ0	5/17/10	0.186	U	0.186	0.2	U	0.2	0.177	U	0.177	0.82	U	3.1	0	U	0.347
SPA-1	J19YH7	5/17/10	0.164	U	0.164	0.193	U	0.193	0.128	U	0.128	0.588	U	3.18	0.056	U	0.269
SPA-2	J19YH8	5/17/10	0.291	U	0.291	0.395	U	0.395	0.222	U	0.222	-0.083	U	3.15	0.033	U	0.256
SPA-3	J19YH9	5/17/10	0.255	U	0.255	0.298	U	0.298	0.169	U	0.169	1.58	U	3.42	-0.039	U	0.376
SPA-5	J19YJ1	5/17/10	0.204	U	0.204	0.25	U	0.25	0.164	U	0.164	1.2	U	3.02	0	U	0.373
SPA-6	J19YJ2	5/17/10	0.287	U	0.287	0.355	U	0.355	0.248	U	0.248	1.32	U	3.13	0	U	0.358
SPA-7	J19YJ3	5/17/10	0.197	U	0.197	0.253	U	0.253	0.146	U	0.146	1.08	U	3.14	0.124	U	0.396
SPA-8	J19YJ4	5/17/10	0.181	U	0.181	0.223	U	0.223	0.191	U	0.191	1.15	U	3.63	-0.075	U	0.357
SPA-9	J19YJ5	5/17/10	0.196	U	0.196	0.277	U	0.277	0.188	U	0.188	0.856	U	3.08	0.074	U	0.354
SPA-10	J19YJ6	5/17/10	0.272	U	0.272	0.325	U	0.325	0.251	U	0.251	1.6	U	3.11	-0.04	U	0.302
SPA-11	J19YJ7	5/17/10	0.064	U	0.064	0.085	U	0.085	0.054	U	0.054	0.732	U	3.08	-0.032	U	0.248
SPA-12	J19YJ8	5/17/10	0.104	U	0.104	0.128	U	0.128	0.084	U	0.084	0.22	U	3.33	0.034	U	0.258
Duplicate of J19YJ4	J19YJ9	5/17/10	0.073	U	0.073	0.089	U	0.089	0.057	U	0.057	1.23	U	3	0	U	0.268

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Plutonium-239/240			Potassium-40			Radium-226			Radium-228			Silver-108 metastable		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0	U	0.214	12.5		0.753	0.511		0.132	0.461		0.377	0.066	U	0.066
SZ-9 re-sample 1	J1FKL4	3/16/11	-0.00291	U	0.121										0.00194	U	0.0178
SZ-11	J19YC8	5/18/10	0	U	0.234	15.6		0.392	0.684		0.08	0.868		0.17	0.029	U	0.029
SZ-11 re-sample 1	J1FKL5	3/16/11	-0.00166	U	0.125										-0.0059	U	0.0213
OB-8	J19YH1	5/13/10	0	U	0.201	11.4		0.642	0.43		0.107	0.673		0.285	0.043	U	0.043
OB-8 re-sample 1	J1FKL6	3/17/11	-0.00397	U	0.165										-0.00434	U	0.023
SPA-4	J19YJ0	5/17/10	0.108	U	0.277	12.4		0.709	0.390		0.116	0.557		0.282	0.051	U	0.051
SPA-4 re-sample 1	J1FKM0	3/17/11	-0.00300	U	0.125										0.0143	U	0.065
Duplicate of J1FKM0	J1FKM9	3/17/11	0	U	0.107										0.0114	U	0.0461
SPA-1	J19YH7	5/17/10	0.028	U	0.215	12.7		0.574	0.404		0.095	0.608		0.231	0.046	U	0.046
SPA-1 re-sample 1	J1FKL7	3/17/11	-0.00176	U	0.131										0.00263	U	0.0175
SPA-2	J19YH8	5/17/10	0.033	U	0.255	14.8		1.08	0.505		0.239	0.818		0.451	0.080	U	0.080
SPA-2 re-sample 1	J1FKL8	3/17/11	0	U	0.196										0.00455	U	0.0249
SPA-3	J19YH9	5/17/10	-0.039	U	0.300	15.6		1.11	0.689		0.168	0.842		0.466	0.054	U	0.054
SPA-3 re-sample 1	J1FKL9	3/17/11	0	U	0.171										-0.0018	U	0.0226
SPA-5	J19YJ1	5/17/10	0.049	U	0.373	12.3		0.885	0.565		0.109	1.03		0.280	0.053	U	0.053
SPA-5 re-sample 1	J1FKM1	3/17/11	-0.00196	U	0.147										-0.00601	U	0.0637
SPA-6	J19YJ2	5/17/10	0.032	U	0.248	12.3		1.09	0.494		0.205	1.05		0.518	0.092	U	0.092
SPA-6 re-sample 1	J1FKM2	3/17/11	-0.00155	U	0.116										0.00246	U	0.0294
SPA-7	J19YJ3	5/17/10	-0.041	U	0.316	15.6		0.834	0.395		0.138	0.775		0.256	0.047	U	0.047
SPA-7 re-sample 1	J1FKM3	3/17/11	0.0666	U	0.128										-0.00435	U	0.0228
SPA-8	J19YJ4	5/17/10	0	U	0.285	12.3		0.628	0.506		0.140	0.500		0.255	0.054	U	0.054
SPA-8 re-sample 1	J1FKM4	3/17/11	0.0282	U	0.131										-0.00839	U	0.0228
SPA-9	J19YJ5	5/17/10	0.037	U	0.283	11.8		0.881	0.370		0.159	0.736		0.363	0.056	U	0.056
SPA-9 re-sample 1	J1FKM5	3/17/11	0	U	0.133										-0.000774	U	0.028
SPA-10	J19YJ6	5/17/10	0	U	0.302	14.1		1.07	0.832		0.213	1.06		0.474	0.082	U	0.082
SPA-10 re-sample 1	J1FKM6	3/17/11	-0.00384	U	0.160										0.00951	U	0.0267
SPA-11	J19YJ7	5/17/10	0	U	0.247	12.9		0.258	0.496		0.048	0.676		0.098	0.017	U	0.017
SPA-11 re-sample 1	J1FKM7	3/17/11	0	U	0.140										0.00815	U	0.0306
SPA-12	J19YJ8	5/17/10	0	U	0.258	14.6		0.43	0.551		0.085	0.750		0.178	0.032	U	0.032
SPA-12 re-sample 1	J1FKM8	3/17/11	-0.0034	U	0.142										-0.00141	U	0.0169
Duplicate of J19YJ4	J19YJ9	5/17/10	0	U	0.267	15.7		0.301	0.567		0.057	0.829		0.137	0.019	U	0.019

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.133	U	0.414	0.642		0.1	0.461		0.377	-0.065	U	0.309	3.19	J	2.62
SZ-9 re-sample 1	J1FKL4	3/16/11	0.283	U	0.639							-0.0679	U	0.174	0.0527		0.0245
SZ-11	J19YC8	5/18/10	-0.091	U	0.37	0.73		0.055	0.868		0.17	0.113	U	0.235	0.097	U	2.99
SZ-11 re-sample 1	J1FKL5	3/16/11	0.467	U	0.644							-0.0415	U	0.193	0.0530		0.0137
OB-8	J19YH1	5/13/10	0.004	U	0.452	0.62		0.075	0.673		0.285	-0.051	U	0.291	3.09		2.68
OB-8 re-sample 1	J1FKL6	3/17/11	-0.0128	U	0.642							0.0560	U	0.186	0.00188	U	0.0264
SPA-4	J19YJ0	5/17/10	0.082	U	0.418	0.564		0.094	0.557		0.282	0.088	U	0.325	-1.24	U	7.16
SPA-4 re-sample 1	J1FKM0	3/17/11	0.165	U	0.607							0.0938	U	0.171	0.00250	U	0.0166
Duplicate of J1FKM0	J1FKM9	3/17/11	0.177	U	0.626							0.0251	U	0.170	-0.00206	U	0.0161
SPA-1	J19YH7	5/17/10	0.048	U	0.453	0.455		0.064	0.608		0.231	0.013	U	0.289	1.42	U	7.5
SPA-1 re-sample 1	J1FKL7	3/17/11	0.403	U	0.625							0.0850	U	0.171	0.000742	U	0.0166
SPA-2	J19YH8	5/17/10	0.130	U	0.462	0.525		0.217	0.818		0.451	0.007	U	0.313	-0.359	U	7.59
SPA-2 re-sample 1	J1FKL8	3/17/11	0.288	U	0.624							0.0101	U	0.167	0.00638	U	0.0156
SPA-3	J19YH9	5/17/10	0.181	U	0.420	1.04		0.108	0.842		0.466	0.053	U	0.265	-2.56	U	7.38
SPA-3 re-sample 1	J1FKL9	3/17/11	0.520	U	0.617							0.0241	U	0.154	0.00375	U	0.0153
SPA-5	J19YJ1	5/17/10	0.086	U	0.399	0.927		0.137	1.03		0.280	-0.028	U	0.244	-2.27	U	8.46
SPA-5 re-sample 1	J1FKM1	3/17/11	0.397	U	0.621							0.0856	U	0.178	0.00266	U	0.0248
SPA-6	J19YJ2	5/17/10	0.195	U	0.428	0.687		0.134	1.05		0.518	-0.038	U	0.317	2.46	U	7.44
SPA-6 re-sample 1	J1FKM2	3/17/11	0.256	U	0.618							0.0207	U	0.173	0.0113	U	0.0278
SPA-7	J19YJ3	5/17/10	0.034	U	0.435	0.697		0.097	0.775		0.256	-0.067	U	0.314	-1.83	U	8.27
SPA-7 re-sample 1	J1FKM3	3/17/11	0.439	U	0.65							0.0345	U	0.170	0.0167	U	0.0237
SPA-8	J19YJ4	5/17/10	0.012	U	0.420	0.573		0.079	0.500		0.255	0.122	U	0.327	-0.83	U	7.52
SPA-8 re-sample 1	J1FKM4	3/17/11	0.485	U	0.615							0.0396	U	0.173	0.00300	U	0.0241
SPA-9	J19YJ5	5/17/10	0.086	U	0.417	0.693		0.098	0.736		0.363	0.033	U	0.290	1.25	U	8.79
SPA-9 re-sample 1	J1FKM5	3/17/11	0.237	U	0.645							0.0531	U	0.173	0.00601	U	0.0336
SPA-10	J19YJ6	5/17/10	0.144	U	0.426	0.666		0.154	1.06		0.474	0.004	U	0.328	-1.06	U	7.45
SPA-10 re-sample 1	J1FKM6	3/17/11	0.427	U	0.633							0.0381	U	0.166	0.00556	U	0.0140
SPA-11	J19YJ7	5/17/10	0.056	U	0.444	0.7		0.031	0.676		0.098	0.074	U	0.332	-1.64	U	7.42
SPA-11 re-sample 1	J1FKM7	3/17/11	0.575	U	0.615							0.110	U	0.167	0.00634	U	0.0126
SPA-12	J19YJ8	5/17/10	-0.015	U	0.430	0.756		0.057	0.75		0.178	0.049	U	0.364	-1.72	U	7.77
SPA-12 re-sample 1	J1FKM8	3/17/11	0.809		0.656							0.0884	U	0.172	0.00631	U	0.0206
Duplicate of J19YJ4	J19YJ9	5/17/10	0.028	U	0.404	0.831		0.036	0.829		0.137	0.013	U	0.296	0.457	U	7.26

Attachment	1	Sheet No.	32 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.575		0.259	0.041	U	0.314	0.380	U	0.380	0.542		0.259	10.4	U	10.4
SZ-9 re-sample 1	J1FKL4	3/16/11	0.0792	U	0.114	-0.00137	U	0.102				0.214		0.123			
SZ-11	J19YC8	5/18/10	0.688		0.176	0.028	U	0.213	0.200	U	0.200	0.551		0.176	4.10	U	4.10
SZ-11 re-sample 1	J1FKL5	3/16/11	0.196		0.123	-0.00163	U	0.123				0.454		0.137			
OB-8	J19YH1	5/13/10	0.404		0.206	0.033	U	0.249	0.317	U	0.317	0.592		0.206	7.17	U	7.17
OB-8 re-sample 1	J1FKL6	3/17/11	0.138	U	0.177	-0.0119	U	0.154				0.186	U	0.191			
SPA-4	J19YJ0	5/17/10	0.366		0.280	0.133	U	0.339	0.370	U	0.370	0.44		0.28	7.81	U	7.81
SPA-4 re-sample 1	J1FKM0	3/17/11	0.127		0.120	-0.00158	U	0.101				0.0772	U	0.101			
Duplicate of J1FKM0	J1FKM9	3/17/11	0.058	U	0.139	0.0162	U	0.122				0.236		0.163			
SPA-1	J19YH7	5/17/10	0.236		0.164	0.052	U	0.198	0.302	U	0.302	0.279		0.164	7.01	U	7.01
SPA-1 re-sample 1	J1FKL7	3/17/11	0.218		0.142	-0.00464	U	0.111				0.174		0.135			
SPA-2	J19YH8	5/17/10	0.552		0.264	0	U	0.32	0.529	U	0.529	0.345		0.264	12.6	U	12.6
SPA-2 re-sample 1	J1FKL8	3/17/11	0.043	U	0.105	0	U	0.0873				0.115		0.0873			
SPA-3	J19YH9	5/17/10	0.32		0.204	0.065	U	0.247	0.421	U	0.421	0.427		0.204	10.4	U	10.4
SPA-3 re-sample 1	J1FKL9	3/17/11	0.162		0.087	-0.00116	U	0.087				0.16		0.097			
SPA-5	J19YJ1	5/17/10	0.488		0.208	0.033	U	0.251	0.359	U	0.359	0.38		0.208	8.44	U	8.44
SPA-5 re-sample 1	J1FKM1	3/17/11	0.138		0.130	0.0551	U	0.109				0.0244	U	0.126			
SPA-6	J19YJ2	5/17/10	0.474		0.202	0.064	U	0.244	0.576	U	0.576	0.791		0.202	12.5	U	12.5
SPA-6 re-sample 1	J1FKM2	3/17/11	0.141	U	0.154	-0.00773	U	0.135				0.132	U	0.18			
SPA-7	J19YJ3	5/17/10	1.01		0.257	0	U	0.312	0.373	U	0.373	0.774		0.257	8.73	U	8.73
SPA-7 re-sample 1	J1FKM3	3/17/11	0.0757	U	0.147	-0.0056	U	0.134				0.13	U	0.153			
SPA-8	J19YJ4	5/17/10	0.85		0.21	0.033	U	0.254	0.413	U	0.413	0.302		0.21	8.54	U	8.54
SPA-8 re-sample 1	J1FKM4	3/17/11	0.207		0.119	0	U	0.0988				0.183		0.0988			
SPA-9	J19YJ5	5/17/10	0.497		0.055	0.024	U	0.044	0.380	U	0.380	0.491		0.036	9.02	U	9.02
SPA-9 re-sample 1	J1FKM5	3/17/11	0.453		0.106	0.0494	U	0.095				0.224		0.114			
SPA-10	J19YJ6	5/17/10	0.436		0.052	0.005	U	0.039	0.551	U	0.551	0.428		0.047	11.4	U	11.4
SPA-10 re-sample 1	J1FKM6	3/17/11	0.187		0.100	-0.00133	U	0.1				0.211		0.112			
SPA-11	J19YJ7	5/17/10	0.496		0.158	0.05	U	0.191	0.145	U	0.145	0.393		0.158	2.76	U	2.76
SPA-11 re-sample 1	J1FKM7	3/17/11	0.141		0.111	-0.00145	U	0.0931				0.0711	U	0.0931			
SPA-12	J19YJ8	5/17/10	0.692		0.165	0	U	0.2	0.203	U	0.203	0.346		0.165	4.64	U	4.64
SPA-12 re-sample 1	J1FKM8	3/17/11	0.0717	U	0.178	0.0756	U	0.15				0.189		0.173			
Duplicate of J19YJ4	J19YJ9	5/17/10	0.33		0.194	0.031	U	0.235	0.148	U	0.148	0.635		0.194	4.79	U	4.79

Attachment	1	Sheet No.	33 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-2 - J19YB9			Duplicate of J19YB9 - J19YD0			SZ-1 - J19YB8			SZ-3 - J19YC0			SZ-4 - J19YC1		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	2.79	J	3.48
Acenaphthylene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	3.48	U	3.48
Anthracene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	3.48	U	3.48
Benzo(a)anthracene	PAH	3.87	U	3.87	0.858	J	3.43	1.05	J	3.51	4.71		3.36	7.32		3.48
Benzo(a)pyrene	PAH	3.87	U	3.87	1.20	J	3.43	3.51	U	3.51	5.05		3.36	6.97		3.48
Benzo(b)fluoranthene	PAH	1.16	J	3.87	1.54	J	3.43	0.878	J	3.51	6.73		3.36	11.3		3.48
Benzo(ghi)perylene	PAH	3.87	U	3.87	1.03	J	3.43	3.51	U	3.51	3.87		3.36	3.48	U	3.48
Benzo(k)fluoranthene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	2.52	J	3.36	3.49		3.48
Chrysene	PAH	3.87	U	3.87	3.43	U	3.43	1.05	J	3.51	5.38		3.36	8.37		3.48
Dibenz[a,h]anthracene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	2.62	J	3.48
Fluoranthene	PAH	3.87	U	3.87	2.57	J	3.43	2.46	J	3.51	21.4		3.36	19.9		3.48
Fluorene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	3.48	U	3.48
Indeno(1,2,3-cd)pyrene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	4.54		3.36	7.15		3.48
Naphthalene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	15.0		3.36	3.48	U	3.48
Phenanthrene	PAH	1.16	J	3.87	1.2	J	3.43	1.58	J	3.51	7.57		3.36	5.93		3.48
Pyrene	PAH	3.87	U	3.87	3.43	U	3.43	1.23	J	3.51	14.5		3.36	17.3		3.48
Aroclor-1016	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1221	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1232	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1242	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1248	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1254	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1260	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	3.85	J	13.4	13.8	U	13.8
Aldrin	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Alpha-BHC	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
alpha-Chlordane	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Beta-BHC	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Delta-BHC	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
4,4'-DDD	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
4,4'-DDE	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
4,4'-DDT	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Dieldrin	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endosulfan I	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endosulfan II	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endosulfan sulfate	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endrin	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endrin aldehyde	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endrin ketone	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Gamma-BHC (Lindane)	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
gamma-Chlordane	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Heptachlor	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Heptachlor epoxide	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Methoxychlor	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Toxaphene	PEST	21.9	UJD	21.9	20.6	UD	20.6	20.7	UJD	20.7	20.1	UJD	20.1	20.8	UJD	20.8

Attachment	1	Sheet No.	34 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-5 - J19YC2			SZ-6 - J19YC3			SZ-7 - J19YC4			SZ-8 - J19YC5			SZ-9 - J19YC6		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.52	U	3.52	3.45	U	3.45	3.49	U	3.49	3.46	U	3.46	3.51	U	3.51
Acenaphthylene	PAH	3.52	U	3.52	3.45	U	3.45	3.49	U	3.49	3.46	U	3.46	3.51	U	3.51
Anthracene	PAH	3.52	U	3.52	3.45	U	3.45	2.45	J	3.49	1.04	J	3.46	4.21		3.51
Benzo(a)anthracene	PAH	8.99		3.52	3.11	J	3.45	11.2		3.49	6.59		3.46	47.4		3.51
Benzo(a)pyrene	PAH	8.99		3.52	3.98		3.45	11.4		3.49	8.15		3.46	414		3.51
Benzo(b)fluoranthene	PAH	9.17		3.52	7.95		3.45	18.4		3.49	12		3.46	51.2		3.51
Benzo(ghi)perylene	PAH	6.52		3.52	3.63		3.45	10.1		3.49	9.36		3.46	24.7		3.51
Benzo(k)fluoranthene	PAH	3.88		3.52	1.73	J	3.45	5.77		3.49	3.99		3.46	16.5		3.51
Chrysene	PAH	11.5		3.52	2.94	J	3.45	16.4		3.49	4.68		3.46	70.9		3.51
Dibenz[a,h]anthracene	PAH	1.23	J	3.52	3.45	U	3.45	2.1	J	3.49	1.56	J	3.46	3.69		3.51
Fluoranthene	PAH	31.2		3.52	9.34		3.45	27.1		3.49	25		3.46	102		3.51
Fluorene	PAH	3.52	U	3.52	3.45	U	3.45	1.57	J	3.49	0.867	J	3.46	3.51	U	3.51
Indeno(1,2,3-cd)pyrene	PAH	6.7		3.52	5.01		3.45	9.97		3.49	8.32		3.46	3.51	U	3.51
Naphthalene	PAH	3.52	U	3.52	3.45	U	3.45	3.49	U	3.49	3.46	U	3.46	3.51	U	3.51
Phenanthrene	PAH	11.6		3.52	3.98		3.45	10.5		3.49	9.88		3.46	33.7		3.51
Pyrene	PAH	23.1		3.52	6.4		3.45	29.4		3.49	16.5		3.46	91.8		3.51
Aroclor-1016	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1221	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1232	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1242	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1248	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1254	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1260	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aldrin	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Alpha-BHC	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
alpha-Chlordane	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Beta-BHC	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Delta-BHC	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
4,4'-DDD	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
4,4'-DDE	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.81	JD	1.81
4,4'-DDT	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	2.89	JD	2.89
Dieldrin	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endosulfan I	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endosulfan II	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endosulfan sulfate	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endrin	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endrin aldehyde	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endrin ketone	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Gamma-BHC (Lindane)	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
gamma-Chlordane	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Heptachlor	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Heptachlor epoxide	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Methoxychlor	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Toxaphene	PEST	20.2	UJD	20.2	20.6	UJD	20.6	20.4	UJD	20.4	20.5	UJD	20.5	20.9	UD	20.9

Attachment	1	Sheet No.	35 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-9 re-sample 1, J1FKL4			SZ-10 - J19YC7			SZ-11 - J19YC8			SZ-11 re-sample 1, J1FKL5			SZ-12 - J19YC9		
		3/16/11			5/18/10			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	11	U	11	3.43	U	3.43	17.1	U	17.1	10	U	10	3.4	U	3.4
Acenaphthylene	PAH	9.5	U	9.5	3.43	U	3.43	17.1	U	17.1	9.0	U	9.0	3.4	U	3.4
Anthracene	PAH	3.2	U	3.2	2.23	J	3.43	84.5	D	17.1	7.6	J	3.1	3.4	U	3.4
Benzo(a)anthracene	PAH	10	J	3.4	15.5		3.43	512	D	17.1	23		3.2	3.4	U	3.4
Benzo(a)pyrene	PAH	11	J	6.8	15.8		3.43	640	D	17.1	18		6.4	1.19	J	3.4
Benzo(b)fluoranthene	PAH	5.7	JX	4.4	24.9		3.43	549	D	17.1	20		4.2	1.19	J	3.4
Benzo(ghi)perylene	PAH	7.6	U	7.6	23.4		3.43	306	D	17.1	7.2	U	7.2	3.4	U	3.4
Benzo(k)fluoranthene	PAH	5.8	J	4.2	8.59		3.43	262	D	17.1	10	J	4.0	3.4	U	3.4
Chrysene	PAH	10	J	5.1	12.2		3.43	425	D	17.1	18	J	4.9	0.851	J	3.4
Dibenz[a,h]anthracene	PAH	12	U	12	2.75	J	3.43	82.6	D	17.1	11	U	11	3.4	U	3.4
Fluoranthene	PAH	14	U	14	38.5		3.43	1040	D	17.1	48		13	3.06	J	3.4
Fluorene	PAH	5.6	U	5.6	1.03	J	3.43	43.5	D	17.1	5.3	U	5.3	3.4	U	3.4
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	16.8		3.43	17.1	U	17.1	14	J	12	3.4	U	3.4
Naphthalene	PAH	13	U	13	3.43	U	3.43	51.2	D	17.1	12	U	12	3.4	U	3.4
Phenanthrene	PAH	13	U	13	10.8		3.43	325	D	17.1	31	J	12	1.53	J	3.4
Pyrene	PAH	14	J	13	39.4		3.43	944	D	17.1	47		12	3.4	U	3.4
Aroclor-1016	PCB	2.9	U	2.9	13.5	U	13.5	13.8	U	13.8	2.8	U	2.8	13.7	U	13.7
Aroclor-1221	PCB	8.4	U	8.4	13.5	U	13.5	13.8	U	13.8	8.2	U	8.2	13.7	U	13.7
Aroclor-1232	PCB	2.1	U	2.1	13.5	U	13.5	13.8	U	13.8	2.0	U	2.0	13.7	U	13.7
Aroclor-1242	PCB	4.9	U	4.9	13.5	U	13.5	13.8	U	13.8	4.8	U	4.8	13.7	U	13.7
Aroclor-1248	PCB	4.9	U	4.9	13.5	U	13.5	13.8	U	13.8	4.8	U	4.8	13.7	U	13.7
Aroclor-1254	PCB	2.7	U	2.7	13.5	U	13.5	13.8	U	13.8	2.7	U	2.7	13.7	U	13.7
Aroclor-1260	PCB	2.7	U	2.7	13.5	U	13.5	13.8	U	13.8	2.7	U	2.7	13.7	U	13.7
Aldrin	PEST	0.26	U	0.26	1.36	UD	1.36	1.38	UD	1.38	0.26	U	0.26	1.37	UD	1.37
Alpha-BHC	PEST	0.23	U	0.23	1.36	UD	1.36	1.38	UD	1.38	0.22	U	0.22	1.37	UD	1.37
alpha-Chlordane	PEST	0.34	U	0.34	1.36	UD	1.36	1.38	UD	1.38	0.33	U	0.33	1.37	UD	1.37
Beta-BHC	PEST	0.70	U	0.70	1.36	UD	1.36	1.38	UD	1.38	0.67	U	0.67	1.37	UD	1.37
Delta-BHC	PEST	0.42	U	0.42	1.36	UD	1.36	1.38	UD	1.38	0.41	U	0.41	1.37	UD	1.37
4,4'-DDD	PEST	0.58	U	0.58	1.36	UD	1.36	2.18	JD	2.18	0.55	U	0.55	1.37	UD	1.37
4,4'-DDE	PEST	0.25	U	0.25	1.36	UD	1.36	6.29	D	6.29	0.45	J	0.24	1.37	UD	1.37
4,4'-DDT	PEST	0.62	U	0.62	1.36	UD	1.36	2.59	JD	2.59	0.60	U	0.60	1.37	UD	1.37
Dieldrin	PEST	0.22	U	0.22	1.36	UD	1.36	1.38	UD	1.38	0.21	U	0.21	1.37	UD	1.37
Endosulfan I	PEST	0.19	U	0.19	1.36	UD	1.36	1.38	UD	1.38	0.18	U	0.18	1.37	UD	1.37
Endosulfan II	PEST	0.30	U	0.30	1.36	UD	1.36	1.38	UD	1.38	0.29	U	0.29	1.37	UD	1.37
Endosulfan sulfate	PEST	0.29	U	0.29	1.36	UD	1.36	1.38	UD	1.38	0.28	U	0.28	1.37	UD	1.37
Endrin	PEST	0.32	U	0.32	1.36	UD	1.36	1.38	UD	1.38	0.31	U	0.31	1.37	UD	1.37
Endrin aldehyde	PEST	0.18	U	0.18	1.36	UD	1.36	1.38	UD	1.38	0.17	U	0.17	1.37	UD	1.37
Endrin ketone	PEST	0.52	U	0.52	1.36	UD	1.36	1.38	UD	1.38	0.50	U	0.50	1.37	UD	1.37
Gamma-BHC (Lindane)	PEST	0.49	U	0.49	1.36	UD	1.36	1.38	UD	1.38	0.47	U	0.47	1.37	UD	1.37
gamma-Chlordane	PEST	0.28	U	0.28	1.36	UD	1.36	1.38	UD	1.38	0.27	U	0.27	1.37	UD	1.37
Heptachlor	PEST	0.23	U	0.23	1.36	UD	1.36	1.38	UD	1.38	0.22	U	0.22	1.37	UD	1.37
Heptachlor epoxide	PEST	0.45	U	0.45	1.36	UD	1.36	1.38	UD	1.38	0.43	U	0.43	1.37	UD	1.37
Methoxychlor	PEST	0.47	U	0.47	1.36	UD	1.36	1.38	UD	1.38	0.46	U	0.46	1.37	UD	1.37
Toxaphene	PEST	17	U	17	20.4	UJD	20.4	20.7	UD	20.7	16	U	16	20.6	UD	20.6

Attachment	1	Sheet No.	36 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-1 - J19YD1			DZ-1 re-sample 1, J1FKK1			DZ-1 re-sample 2, J1HH80			DZ-2 - J19YD2			DZ-2 re-sample 1. J1FKK2		
		5/18/10			3/16/11			4/13/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10.1		3.48	10	U	10	11	U	11	3.51	U	3.51	11	U	11
Acenaphthylene	PAH	3.48	U	3.48	9.3	U	9.3	9.6	U	9.6	3.51	U	3.51	9.6	U	9.6
Anthracene	PAH	3.48	U	3.48	3.1	U	3.1	5.1	J	3.3	3.51	U	3.51	3.3	U	3.3
Benzo(a)anthracene	PAH	5.76		3.48	18		3.3	32		3.4	3.69		3.51	30		3.4
Benzo(a)pyrene	PAH	5.93		3.48	19		6.6	27		6.9	2.46	J	3.51	25		6.8
Benzo(b)fluoranthene	PAH	8.89		3.48	20		4.3	27		4.5	3.86		3.51	29		4.5
Benzo(ghi)perylene	PAH	5.23		3.48	7.4	U	7.4	16	J	7.7	2.28	J	3.51	7.7	U	7.7
Benzo(k)fluoranthene	PAH	2.79	J	3.48	8.6	J	4.1	13	J	4.2	1.41	J	3.51	16		4.2
Chrysene	PAH	9.42		3.48	17	J	5.0	26	J	5.2	5.62		3.51	27	J	5.2
Dibenz[a,h]anthracene	PAH	3.48	U	3.48	11	U	11	12	U	12	3.51	U	3.51	12	U	12
Fluoranthene	PAH	14.1		3.48	13	U	13	43		14	9.13		3.51	45		14
Fluorene	PAH	3.48	U	3.48	5.4	U	5.4	5.7	U	5.7	3.51	U	3.51	5.6	U	5.6
Indeno(1,2,3-cd)pyrene	PAH	3.48	U	3.48	15	J	12	19	J	13	2.28	J	3.51	20	J	13
Naphthalene	PAH	3.48	U	3.48	12	U	12	13	U	13	3.51	U	3.51	13	U	13
Phenanthrene	PAH	5.58		3.48	12	J	12	18	J	13	3.16	J	3.51	15	J	13
Pyrene	PAH	12.9		3.48	31	J	12	48		13	7.2		3.51	51		13
Aroclor-1016	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1221	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1232	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1242	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1248	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1254	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1260	PCB	13.7	U	13.7							13.1	U	13.1			
Aldrin	PEST	1.37	UD	1.37							1.31	UD	1.31			
Alpha-BHC	PEST	1.37	UD	1.37							1.31	UD	1.31			
alpha-Chlordane	PEST	1.37	UD	1.37							1.31	UD	1.31			
Beta-BHC	PEST	1.37	UD	1.37							1.31	UD	1.31			
Delta-BHC	PEST	1.37	UD	1.37							1.31	UD	1.31			
4,4'-DDD	PEST	1.37	UD	1.37							1.31	UD	1.31			
4,4'-DDE	PEST	1.37	UD	1.37							1.31	UD	1.31			
4,4'-DDT	PEST	1.37	UD	1.37							1.31	UD	1.31			
Dieldrin	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endosulfan I	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endosulfan II	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endosulfan sulfate	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endrin	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endrin aldehyde	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endrin ketone	PEST	1.37	UD	1.37							1.31	UD	1.31			
Gamma-BHC (Lindane)	PEST	1.37	UD	1.37							1.31	UD	1.31			
gamma-Chlordane	PEST	1.37	UD	1.37							1.31	UD	1.31			
Heptachlor	PEST	1.37	UD	1.37							1.31	UD	1.31			
Heptachlor epoxide	PEST	1.37	UD	1.37							1.31	UD	1.31			
Methoxychlor	PEST	1.37	UD	1.37							1.31	UD	1.31			
Toxaphene	PEST	20.6	UJD	20.6							19.6	UJD	19.6			

Attachment	1	Sheet No.	37 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-2 re-sample 2, J1HH81			DZ-3 - J19YD3			DZ-3 re-sample 1, J1FKK3			DZ-3 re-sample 2, J1HH82			DZ-4 - J19YD4		
		4/13/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	3.56	U	3.56	12	U	12	9.9	U	9.9	6.88		3.52
Acenaphthylene	PAH	9.1	U	9.1	3.56	U	3.56	11	U	11	8.9	U	8.9	3.52	U	3.52
Anthracene	PAH	3.1	U	3.1	0.891	J	3.56	3.6	U	3.6	3.0	U	3.0	1.41	J	3.52
Benzo(a)anthracene	PAH	3.2	U	3.2	21.2		3.56	9.3	J	3.8	3.1	U	3.1	14.5		3.52
Benzo(a)pyrene	PAH	6.4	U	6.4	17.8		3.56	14	J	7.6	6.3	U	6.3	15.7		3.52
Benzo(b)fluoranthene	PAH	4.2	U	4.2	33.7		3.56	12	J	5.0	4.1	U	4.1	25.8		3.52
Benzo(ghi)perylene	PAH	7.2	U	7.2	13.9		3.56	8.5	U	8.5	7.1	U	7.1	13.2		3.52
Benzo(k)fluoranthene	PAH	4.0	U	4.0	11.4		3.56	5.6	J	4.7	3.9	U	3.9	8.82		3.52
Chrysene	PAH	4.9	U	4.9	21.6		3.56	12	J	5.7	4.8	U	4.8	35.1		3.52
Dibenz[a,h]anthracene	PAH	11	U	11	2.5	J	3.56	13	U	13	11	U	11	2.65	J	3.52
Fluoranthene	PAH	13	U	13	42.8		3.56	15	U	15	13	U	13	40		3.52
Fluorene	PAH	5.3	U	5.3	3.56	U	3.56	6.3	U	6.3	5.2	U	5.2	2.12	J	3.52
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	14.3		3.56	14	U	14	12	U	12	12.5		3.52
Naphthalene	PAH	12	U	12	3.56	U	3.56	14	U	14	12	U	12	3.52	U	3.52
Phenanthrene	PAH	12	U	12	6.77		3.56	14	U	14	12	U	12	9.17		3.52
Pyrene	PAH	12	U	12	46.7		3.56	18	J	14	12	U	12	34.2		3.52
Aroclor-1016	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1221	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1232	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1242	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1248	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1254	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1260	PCB				7.31	J	13.9							13.8	U	13.8
Aldrin	PEST				1.39	UD	1.39							1.39	UD	1.39
Alpha-BHC	PEST				1.39	UD	1.39							1.39	UD	1.39
alpha-Chlordane	PEST				1.39	UD	1.39							1.39	UD	1.39
Beta-BHC	PEST				1.39	UD	1.39							1.39	UD	1.39
Delta-BHC	PEST				1.39	UD	1.39							1.39	UD	1.39
4,4'-DDD	PEST				2.12	JD	1.39							1.39	UD	1.39
4,4'-DDE	PEST				1.39	UD	1.39							1.39	UD	1.39
4,4'-DDT	PEST				3.1	JD	1.39							1.39	UD	1.39
Dieldrin	PEST				1.39	UD	1.39							1.39	UD	1.39
Endosulfan I	PEST				1.39	UD	1.39							1.39	UD	1.39
Endosulfan II	PEST				1.39	UD	1.39							1.39	UD	1.39
Endosulfan sulfate	PEST				1.39	UD	1.39							1.39	UD	1.39
Endrin	PEST				1.39	UD	1.39							1.39	UD	1.39
Endrin aldehyde	PEST				1.39	UD	1.39							1.39	UD	1.39
Endrin ketone	PEST				1.39	UD	1.39							1.39	UD	1.39
Gamma-BHC (Lindane)	PEST				1.39	UD	1.39							1.39	UD	1.39
gamma-Chlordane	PEST				1.39	UD	1.39							1.39	UD	1.39
Heptachlor	PEST				1.39	UD	1.39							1.39	UD	1.39
Heptachlor epoxide	PEST				1.39	UD	1.39							1.39	UD	1.39
Methoxychlor	PEST				1.39	UD	1.39							1.39	UD	1.39
Toxaphene	PEST				20.9	UJD	20.9							20.8	UJD	20.8

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-4 re-sample 1, J1FKK4			DZ-4 re-sample 2, J1HH83			DZ-5 - J19YD5			DZ-5 re-sample 1, J1FKK5			DZ-6 - J19YD6		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	5.98		3.52	10	U	10	3.51	U	3.51
Acenaphthylene	PAH	9.2	U	9.2	9.0	U	9.0	3.52	U	3.52	9.3	U	9.3	3.51	U	3.51
Anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.52	U	3.52	3.2	U	3.2	12.8		3.51
Benzo(a)anthracene	PAH	23	X	3.3	54		3.2	5.46		3.52	3.3	U	3.3	69.1		3.51
Benzo(a)pyrene	PAH	16		6.5	41		6.4	5.1		3.52	6.6	U	6.6	61.7		3.51
Benzo(b)fluoranthene	PAH	13	JX	4.3	51		4.2	6.51		3.52	4.3	U	4.3	88.4		3.51
Benzo(ghi)perylene	PAH	7.3	U	7.3	32		7.2	4.58		3.52	7.4	U	7.4	41.1		3.51
Benzo(k)fluoranthene	PAH	12	J	4.0	30		4.0	2.46	J	3.52	4.1	U	4.1	33.2		3.51
Chrysene	PAH	22	J	4.9	45		4.9	4.58		3.52	5.0	U	5.0	65		3.51
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	3.52	U	3.52	11	U	11	9.49		3.51
Fluoranthene	PAH	40	J	13	69		13	18		3.52	13	U	13	211		3.51
Fluorene	PAH	5.4	U	5.4	5.3	U	5.3	3.52	U	3.52	5.5	U	5.5	5.27		3.51
Indeno(1,2,3-cd)pyrene	PAH	13	J	12	35		12	3.34	J	3.52	12	U	12	46.1		3.51
Naphthalene	PAH	12	U	12	12	U	12	3.52	U	3.52	12	U	12	3.51	U	3.51
Phenanthrene	PAH	12	U	12	17	J	12	6.51		3.52	12	U	12	50.5		3.51
Pyrene	PAH	41		12	77		12	12.3		3.52	12	U	12	194		3.51
Aroclor-1016	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1221	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1232	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1242	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1248	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1254	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1260	PCB							13.3	U	13.3				13.9	U	13.9
Aldrin	PEST							1.33	UD	1.33				1.4	UD	1.4
Alpha-BHC	PEST							1.33	UD	1.33				1.4	UD	1.4
alpha-Chlordane	PEST							1.33	UD	1.33				1.4	UD	1.4
Beta-BHC	PEST							1.33	UD	1.33				1.4	UD	1.4
Delta-BHC	PEST							1.33	UD	1.33				1.4	UD	1.4
4,4'-DDD	PEST							1.33	UD	1.33				1.4	UD	1.4
4,4'-DDE	PEST							1.33	UD	1.33				1.4	UD	1.4
4,4'-DDT	PEST							1.33	UD	1.33				1.4	UD	1.4
Dieldrin	PEST							1.33	UD	1.33				1.4	UD	1.4
Endosulfan I	PEST							1.33	UD	1.33				1.4	UD	1.4
Endosulfan II	PEST							1.33	UD	1.33				1.4	UD	1.4
Endosulfan sulfate	PEST							1.33	UD	1.33				1.4	UD	1.4
Endrin	PEST							1.33	UD	1.33				1.4	UD	1.4
Endrin aldehyde	PEST							1.33	UD	1.33				1.4	UD	1.4
Endrin ketone	PEST							1.33	UD	1.33				1.4	UD	1.4
Gamma-BHC (Lindane)	PEST							1.33	UD	1.33				1.4	UD	1.4
gamma-Chlordane	PEST							1.33	UD	1.33				1.4	UD	1.4
Heptachlor	PEST							1.33	UD	1.33				1.4	UD	1.4
Heptachlor epoxide	PEST							1.33	UD	1.33				1.4	UD	1.4
Methoxychlor	PEST							1.33	UD	1.33				1.4	UD	1.4
Toxaphene	PEST							20	UJD	20				21	UJD	21

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-6 re-sample 1, J1FKK6			DZ-7 - J19YD7			DZ-7 re-sample 1, J1FKK7			DZ-7 re-sample 2, J1HH84			DZ-8 - J19YD8		
		3/16/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	14.2	UD	14.2	11	U	11	11	U	11	37.1		3.54
Acenaphthylene	PAH	9.3	U	9.3	41.7	JD	14.2	9.7	U	9.7	10	U	10	3.54	U	3.54
Anthracene	PAH	3.1	U	3.1	16.1	JD	14.2	3.3	U	3.3	3.4	U	3.4	2.84	J	3.54
Benzo(a)anthracene	PAH	3.3	U	3.3	592	JD	14.2	23		3.4	3.6	U	3.6	22.3		3.54
Benzo(a)pyrene	PAH	6.6	U	6.6	533	JD	14.2	23		6.9	11	J	7.2	22.5		3.54
Benzo(b)fluoranthene	PAH	4.3	U	4.3	974	JD	14.2	19		4.5	8.2	J	4.7	32.4		3.54
Benzo(ghi)perylene	PAH	7.4	U	7.4	488	JD	14.2	7.7	U	7.7	8.1	U	8.1	19.5		3.54
Benzo(k)fluoranthene	PAH	4.1	U	4.1	350	JD	14.2	9.0	J	4.2	5.8	J	4.4	11.5		3.54
Chrysene	PAH	5.0	U	5.0	602	JD	14.2	21	J	5.2	8.6	J	5.4	27.7		3.54
Dibenz[a,h]anthracene	PAH	11	U	11	86.3	JD	14.2	12	U	12	12	U	12	3.72		3.54
Fluoranthene	PAH	13	U	13	1140	JD	14.2	14	U	14	15	U	15	47.3		3.54
Fluorene	PAH	5.4	U	5.4	14.2	UD	14.2	5.7	U	5.7	5.9	U	5.9	2.13	J	3.54
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	460	JD	14.2	18	J	13	13	U	13	18.1		3.54
Naphthalene	PAH	12	U	12	14.2	UD	14.2	13	U	13	13	U	13	3.54	U	3.54
Phenanthrene	PAH	12	U	12	79.1	JD	14.2	24	J	13	13	U	13	12.8		3.54
Pyrene	PAH	12	U	12	1360	JD	14.2	47	X	13	15	J	13	48.8		3.54
Aroclor-1016	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1221	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1232	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1242	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1248	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1254	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1260	PCB				6.28	J	13.8							14	U	14
Aldrin	PEST				1.38	UD	1.38							1.4	UD	1.4
Alpha-BHC	PEST				1.38	UD	1.38							1.4	UD	1.4
alpha-Chlordane	PEST				1.38	UD	1.38							1.4	UD	1.4
Beta-BHC	PEST				1.38	UD	1.38							1.4	UD	1.4
Delta-BHC	PEST				1.38	UD	1.38							1.4	UD	1.4
4,4'-DDD	PEST				1.38	UD	1.38							1.4	UD	1.4
4,4'-DDE	PEST				1.38	UD	1.38							1.4	UD	1.4
4,4'-DDT	PEST				1.38	UD	1.38							1.4	UD	1.4
Dieldrin	PEST				1.38	UD	1.38							1.4	UD	1.4
Endosulfan I	PEST				1.38	UD	1.38							1.4	UD	1.4
Endosulfan II	PEST				1.38	UD	1.38							1.4	UD	1.4
Endosulfan sulfate	PEST				1.38	UD	1.38							1.4	UD	1.4
Endrin	PEST				1.38	UD	1.38							1.4	UD	1.4
Endrin aldehyde	PEST				1.38	UD	1.38							1.4	UD	1.4
Endrin ketone	PEST				1.38	UD	1.38							1.4	UD	1.4
Gamma-BHC (Lindane)	PEST				1.38	UD	1.38							1.4	UD	1.4
gamma-Chlordane	PEST				1.38	UD	1.38							1.4	UD	1.4
Heptachlor	PEST				1.38	UD	1.38							1.4	UD	1.4
Heptachlor epoxide	PEST				1.38	UD	1.38							1.4	UD	1.4
Methoxychlor	PEST				1.38	UD	1.38							1.4	UD	1.4
Toxaphene	PEST				20.7	UJD	20.7							21.1	UJD	21.1

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-8 re-sample 1, J1FKK8			DZ-8 re-sample 2, J1HH85			DZ-9 - J19YD9			DZ-9 re-sample 1, J1FKK9			DZ-10 - J19YF0		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	9.9	U	9.9	3.48	U	3.48	10	U	10	3.49	U	3.49
Acenaphthylene	PAH	9.4	U	9.4	8.9	U	8.9	3.48	U	3.48	9.0	U	9.0	3.49	U	3.49
Anthracene	PAH	3.2	U	3.2	3.0	U	3.0	3.83		3.48	3.0	U	3.0	1.75	J	3.49
Benzo(a)anthracene	PAH	3.3	U	3.3	3.2	U	3.2	16.7		3.48	3.2	U	3.2	14.1		3.49
Benzo(a)pyrene	PAH	6.7	U	6.7	6.4	U	6.4	14.3		3.48	6.4	U	6.4	14.3		3.49
Benzo(b)fluoranthene	PAH	4.4	U	4.4	4.2	U	4.2	19		3.48	4.2	U	4.2	19.6		3.49
Benzo(ghi)perylene	PAH	7.5	U	7.5	7.1	U	7.1	10.1		3.48	7.2	U	7.2	10.1		3.49
Benzo(k)fluoranthene	PAH	4.1	U	4.1	3.9	U	3.9	7.49		3.48	3.9	U	3.9	6.99		3.49
Chrysene	PAH	5.1	U	5.1	4.8	U	4.8	18.5		3.48	4.8	U	4.8	15.2		3.49
Dibenz[a,h]anthracene	PAH	12	U	12	11	U	11	2.26	J	3.48	11	U	11	2.27	J	3.49
Fluoranthene	PAH	14	U	14	13	U	13	6.09		3.48	13	U	13	39.8		3.49
Fluorene	PAH	5.5	U	5.5	5.2	U	5.2	1.57	J	3.48	5.3	U	5.3	1.22	J	3.49
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	12	U	12	10.8		3.48	12	U	12	11		3.49
Naphthalene	PAH	13	U	13	12	U	12	3.48	U	3.48	12	U	12	3.49	U	3.49
Phenanthrene	PAH	13	U	13	12	U	12	14.1		3.48	12	U	12	1.75	J	3.49
Pyrene	PAH	13	U	13	12	U	12	42.8		3.48	12	U	12	36.2		3.49
Aroclor-1016	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1221	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1232	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1242	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1248	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1254	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1260	PCB							13.4	U	13.4				13.8	UJ	13.8
Aldrin	PEST							1.34	UD	1.34				1.39	UD	1.39
Alpha-BHC	PEST							1.34	UD	1.34				1.39	UD	1.39
alpha-Chlordane	PEST							1.34	UD	1.34				1.39	UD	1.39
Beta-BHC	PEST							1.34	UD	1.34				1.39	UD	1.39
Delta-BHC	PEST							1.34	UD	1.34				1.39	UD	1.39
4,4'-DDD	PEST							1.34	UD	1.34				1.39	UD	1.39
4,4'-DDE	PEST							1.34	UD	1.34				1.39	UD	1.39
4,4'-DDT	PEST							1.34	UD	1.34				1.39	UD	1.39
Dieldrin	PEST							1.34	UD	1.34				1.39	UD	1.39
Endosulfan I	PEST							1.34	UD	1.34				1.39	UD	1.39
Endosulfan II	PEST							1.34	UD	1.34				1.39	UD	1.39
Endosulfan sulfate	PEST							1.34	UD	1.34				1.39	UD	1.39
Endrin	PEST							1.34	UD	1.34				1.39	UD	1.39
Endrin aldehyde	PEST							1.34	UD	1.34				1.39	UD	1.39
Endrin ketone	PEST							1.34	UD	1.34				1.39	UD	1.39
Gamma-BHC (Lindane)	PEST							1.34	UD	1.34				1.39	UD	1.39
gamma-Chlordane	PEST							1.34	UD	1.34				1.39	UD	1.39
Heptachlor	PEST							1.34	UD	1.34				1.39	UD	1.39
Heptachlor epoxide	PEST							1.34	UD	1.34				1.39	UD	1.39
Methoxychlor	PEST							1.34	UD	1.34				1.39	UD	1.39
Toxaphene	PEST							20.1	UJD	20.1				20.8	UJD	20.8

Attachment	1	Sheet No.	41 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-10 re-sample 1, J1FKL0			DZ-11 - J19YF1			DZ-11 re-sample 1, J1FKL1			DZ-12 - J19YF2			DZ-12 re-sample 1, J1FKL2		
		3/16/11			5/18/10			3/16/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	7.77		3.38	11	U	11	3.4	U	3.4	10	U	10
Acenaphthylene	PAH	9.1	U	9.1	3.38	U	3.38	9.8	U	9.8	3.4	U	3.4	9.1	U	9.1
Anthracene	PAH	3.1	U	3.1	9.29		3.38	3.3	U	3.3	15.2		3.4	3.1	U	3.1
Benzo(a)anthracene	PAH	3.2	U	3.2	48.7		3.38	3.5	U	3.5	94		3.4	3.2	U	3.2
Benzo(a)pyrene	PAH	6.4	U	6.4	68.9		3.38	7.0	U	7.0	142		3.4	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.2	U	4.2	69.1		3.38	4.6	U	4.6	107		3.4	4.2	U	4.2
Benzo(ghi)perylene	PAH	7.2	U	7.2	3.38	U	3.38	7.8	U	7.8	3.4	U	3.4	7.3	U	7.3
Benzo(k)fluoranthene	PAH	4.0	U	4.0	27.4		3.38	4.3	U	4.3	57.2		3.4	4.0	U	4.0
Chrysene	PAH	4.9	U	4.9	32.6		3.38	5.3	U	5.3	51.1		3.4	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	3.38	U	3.38	12	U	12	3.4	U	3.4	11	U	11
Fluoranthene	PAH	13	U	13	112		3.38	14	U	14	177		3.4	13	U	13
Fluorene	PAH	5.3	U	5.3	5.41		3.38	5.7	U	5.7	8.01		3.4	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	3.38	U	3.38	13	U	13	3.4	U	3.4	12	U	12
Naphthalene	PAH	12	U	12	3.38	U	3.38	13	U	13	3.4	U	3.4	12	U	12
Phenanthrene	PAH	12	U	12	40.7		3.38	13	U	13	55.9		3.4	12	U	12
Pyrene	PAH	12	U	12	125		3.38	13	U	13	155		3.4	12	U	12
Aroclor-1016	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1221	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1232	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1242	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1248	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1254	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1260	PCB				14.1	U	14.1				13.7	U	13.7			
Aldrin	PEST				1.41	UD	1.41				1.37	UD	1.37			
Alpha-BHC	PEST				1.41	UD	1.41				1.37	UD	1.37			
alpha-Chlordane	PEST				1.41	UD	1.41				1.37	UD	1.37			
Beta-BHC	PEST				1.41	UD	1.41				1.37	UD	1.37			
Delta-BHC	PEST				1.41	UD	1.41				1.37	UD	1.37			
4,4'-DDD	PEST				1.41	UD	1.41				1.37	UD	1.37			
4,4'-DDE	PEST				1.41	UD	1.41				1.37	UD	1.37			
4,4'-DDT	PEST				1.41	UD	1.41				1.37	UD	1.37			
Dieldrin	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endosulfan I	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endosulfan II	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endosulfan sulfate	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endrin	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endrin aldehyde	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endrin ketone	PEST				1.41	UD	1.41				1.37	UD	1.37			
Gamma-BHC (Lindane)	PEST				1.41	UD	1.41				1.37	UD	1.37			
gamma-Chlordane	PEST				1.41	UD	1.41				1.37	UD	1.37			
Heptachlor	PEST				1.41	UD	1.41				1.37	UD	1.37			
Heptachlor epoxide	PEST				1.41	UD	1.41				1.37	UD	1.37			
Methoxychlor	PEST				1.41	UD	1.41				1.37	UD	1.37			
Toxaphene	PEST				21.2	UD	21.2				20.6	UD	20.6			

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J19YD1 - J19YF3			Duplicate of J1FKK8, J1FKL3			Duplicate of J1HH85 re-sample 2, J1HH86			Equipment Blank - J19YK0		
		5/18/10			3/16/11			4/13/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.33	U	3.33	11	U	11	10	U	10			
Acenaphthylene	PAH	3.33	U	3.33	9.6	U	9.6	9.2	U	9.2			
Anthracene	PAH	1.33	J	3.33	3.3	U	3.3	3.1	U	3.1			
Benzo(a)anthracene	PAH	18.3		3.33	3.4	U	3.4	3.2	U	3.2			
Benzo(a)pyrene	PAH	15.2		3.33	6.9	U	6.9	6.5	U	6.5			
Benzo(b)fluoranthene	PAH	12.2		3.33	4.5	U	4.5	4.3	U	4.3			
Benzo(ghi)perylene	PAH	8.33		3.33	7.7	U	7.7	7.3	U	7.3			
Benzo(k)fluoranthene	PAH	6		3.33	4.2	U	4.2	4.0	U	4.0			
Chrysene	PAH	26.3		3.33	5.2	U	5.2	4.9	U	4.9			
Dibenz[a,h]anthracene	PAH	1.17	J	3.33	12	U	12	11	U	11			
Fluoranthene	PAH	40.5		3.33	14	U	14	13	U	13			
Fluorene	PAH	1.17	J	3.33	5.7	U	5.7	5.4	U	5.4			
Indeno(1,2,3-cd)pyrene	PAH	9.33		3.33	13	U	13	12	U	12			
Naphthalene	PAH	3.33	U	3.33	13	U	13	12	U	12			
Phenanthrene	PAH	14.7		3.33	13	U	13	12	U	12			
Pyrene	PAH	36		3.33	13	U	13	12	U	12			
Aroclor-1016	PCB	13.8	U	13.8									
Aroclor-1221	PCB	13.8	U	13.8									
Aroclor-1232	PCB	13.8	U	13.8									
Aroclor-1242	PCB	13.8	U	13.8									
Aroclor-1248	PCB	13.8	U	13.8									
Aroclor-1254	PCB	13.8	U	13.8									
Aroclor-1260	PCB	13.8	U	13.8									
Aldrin	PEST	1.39	UD	1.39									
Alpha-BHC	PEST	1.39	UD	1.39									
alpha-Chlordane	PEST	1.39	UD	1.39									
Beta-BHC	PEST	1.39	UD	1.39									
Delta-BHC	PEST	1.39	UD	1.39									
4,4'-DDD	PEST	1.39	UD	1.39									
4,4'-DDE	PEST	1.39	UD	1.39									
4,4'-DDT	PEST	1.39	UD	1.39									
Dieldrin	PEST	1.39	UD	1.39									
Endosulfan I	PEST	1.39	UD	1.39									
Endosulfan II	PEST	1.39	UD	1.39									
Endosulfan sulfate	PEST	1.39	UD	1.39									
Endrin	PEST	1.39	UD	1.39									
Endrin aldehyde	PEST	1.39	UD	1.39									
Endrin ketone	PEST	1.39	UD	1.39									
Gamma-BHC (Lindane)	PEST	1.39	UD	1.39									
gamma-Chlordane	PEST	1.39	UD	1.39									
Heptachlor	PEST	1.39	UD	1.39									
Heptachlor epoxide	PEST	1.39	UD	1.39									
Methoxychlor	PEST	1.39	UD	1.39									
Toxaphene	PEST	20.8	UD	20.8									

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Originator	J. D. Skoglie	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-2 - J19YB9			Duplicate of J19YB9 - J19YD0			SZ-1 - J19YB8			SZ-3 - J19YC0			SZ-4 - J19YC1		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
1,2-Dichlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
1,3-Dichlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
1,4-Dichlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,4,5-Trichlorophenol	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
2,4,6-Trichlorophenol	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
2,4-Dichlorophenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,4-Dimethylphenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,4-Dinitrophenol	SVOA	1900	UJ	1900	1700	U	1700	1730	UJ	1730	1640	UJ	1640	1720	UJ	1720
2,4-Dinitrotoluene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,6-Dinitrotoluene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Chloronaphthalene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Chlorophenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Methylnaphthalene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Methylphenol (cresol, o-)	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Nitroaniline	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
2-Nitrophenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
3,3'-Dichlorobenzidine	SVOA	760	U	760	679	U	679	694	U	694	658	U	658	688	U	688
3+4 Methylphenol (cresol, m+p)	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
3-Nitroaniline	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
4,6-Dinitro-2-methylphenol	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
4-Bromophenylphenyl ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Chloro-3-methylphenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Chloroaniline	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Chlorophenylphenyl ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Nitroaniline	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
4-Nitrophenol	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
Acenaphthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Acenaphthylene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Anthracene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(a)anthracene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(a)pyrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(b)fluoranthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(ghi)perylene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(k)fluoranthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-chloro-1-methylethyl)ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-Chloroethoxy)methane	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-chloroethyl) ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-ethylhexyl) phthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Butylbenzylphthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Carbazole	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Chrysene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Dibenz[a,h]anthracene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Dibenzofuran	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Diethyl phthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Dimethyl phthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Di-n-butylphthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Di-n-octylphthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Fluoranthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Fluorene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Hexachlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Hexachlorobutadiene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Hexachlorocyclopentadiene	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
Hexachloroethane	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Indeno(1,2,3-cd)pyrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Isophorone	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Naphthalene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Nitrobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
N-Nitroso-di-n-dipropylamine	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
N-Nitrosodiphenylamine	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Pentachlorophenol	SVOA	1900	UJ	1900	1700	U	1700	1730	UJ	1730	1640	UJ	1640	1720	UJ	1720
Phenanthrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Phenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Pyrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-5 - J19YC2			SZ-6 - J19YC3			SZ-7 - J19YC4			SZ-8 - J19YC5			SZ-9 - J19YC6		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
1,2-Dichlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
1,3-Dichlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
1,4-Dichlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,4,5-Trichlorophenol	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
2,4,6-Trichlorophenol	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
2,4-Dichlorophenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,4-Dimethylphenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,4-Dinitrophenol	SVOA	1750	UJ	1750	1710	UJ	1710	1730	UJ	1730	1680	UJ	1680	3430	U	3430
2,4-Dinitrotoluene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,6-Dinitrotoluene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Chloronaphthalene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Chlorophenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Methylnaphthalene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Methylphenol (cresol, o-)	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Nitroaniline	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
2-Nitrophenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
3,3'-Dichlorobenzidine	SVOA	699	U	699	682	U	682	691	U	691	671	U	671	1370	U	1370
3+4 Methylphenol (cresol, m+p)	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
3-Nitroaniline	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
4,6-Dinitro-2-methylphenol	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
4-Bromophenylphenyl ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Chloro-3-methylphenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Chloroaniline	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Chlorophenylphenyl ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Nitroaniline	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
4-Nitrophenol	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
Acenaphthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Acenaphthylene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Anthracene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(a)anthracene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(a)pyrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(b)fluoranthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(ghi)perylene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(k)fluoranthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-chloro-1-methylethyl)ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-Chloroethoxy)methane	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-chloroethyl) ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-ethylhexyl) phthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Butylbenzylphthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Carbazole	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Chrysene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Dibenz[a,h]anthracene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Dibenzofuran	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Diethyl phthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Dimethyl phthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Di-n-butylphthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Di-n-octylphthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Fluoranthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Fluorene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Hexachlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Hexachlorobutadiene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Hexachlorocyclopentadiene	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
Hexachloroethane	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Indeno(1,2,3-cd)pyrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Isophorone	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Naphthalene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Nitrobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
N-Nitroso-di-n-dipropylamine	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
N-Nitrosodiphenylamine	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Pentachlorophenol	SVOA	1750	UJ	1750	1710	UJ	1710	1730	UJ	1730	1680	UJ	1680	3430	U	3430
Phenanthrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Phenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Pyrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686

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Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-9 re-sample 1, J1FKL4			SZ-10 - J19YC7			SZ-11 - J19YC8			SZ-11 re-sample 1, J1FKL5			SZ-12 - J19YC9		
		3/16/11			5/18/10			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	337	UJ	337	342	U	342	28	U	28	340	U	340
1,2-Dichlorobenzene	SVOA	23	U	23	337	U	337	342	U	342	22	U	22	340	U	340
1,3-Dichlorobenzene	SVOA	13	U	13	337	U	337	342	U	342	12	U	12	340	U	340
1,4-Dichlorobenzene	SVOA	14	U	14	337	U	337	342	U	342	14	U	14	340	U	340
2,4,5-Trichlorophenol	SVOA	11	U	11	337	UJ	337	342	U	342	10	U	10	340	U	340
2,4,6-Trichlorophenol	SVOA	11	U	11	337	UJ	337	342	U	342	10	U	10	340	U	340
2,4-Dichlorophenol	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
2,4-Dimethylphenol	SVOA	70	U	70	337	U	337	342	U	342	67	U	67	340	U	340
2,4-Dinitrophenol	SVOA	350	U	350	1690	UJ	1690	1710	U	1710	340	U	340	1700	U	1700
2,4-Dinitrotoluene	SVOA	70	U	70	337	U	337	342	U	342	67	U	67	340	U	340
2,6-Dinitrotoluene	SVOA	30	U	30	337	U	337	342	U	342	28	U	28	340	U	340
2-Chloronaphthalene	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
2-Chlorophenol	SVOA	22	U	22	337	U	337	342	U	342	21	U	21	340	U	340
2-Methylnaphthalene	SVOA	20	U	20	337	U	337	342	U	342	19	U	19	340	U	340
2-Methylphenol (cresol, o-)	SVOA	14	U	14	337	U	337	342	U	342	13	U	13	340	U	340
2-Nitroaniline	SVOA	53	U	53	1690	U	1690	1710	U	1710	50	U	50	1700	U	1700
2-Nitrophenol	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
3,3'-Dichlorobenzidine	SVOA	96	U	96	674	U	674	684	U	684	91	U	91	680	U	680
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	337	U	337	342	U	342	33	U	33	340	U	340
3-Nitroaniline	SVOA	78	U	78	1690	U	1690	1710	U	1710	74	U	74	1700	U	1700
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	337	UJ	337	342	U	342	330	U	330	340	U	340
4-Bromophenylphenyl ether	SVOA	20	U	20	337	U	337	342	U	342	19	U	19	340	U	340
4-Chloro-3-methylphenol	SVOA	70	U	70	337	U	337	342	U	342	67	U	67	340	U	340
4-Chloroaniline	SVOA	87	U	87	337	U	337	342	U	342	83	U	83	340	U	340
4-Chlorophenylphenyl ether	SVOA	22	U	22	337	U	337	342	U	342	21	U	21	340	U	340
4-Nitroaniline	SVOA	77	U	77	1690	U	1690	1710	U	1710	73	U	73	1700	U	1700
4-Nitrophenol	SVOA	100	U	100	1690	U	1690	1710	U	1710	98	U	98	1700	U	1700
Acenaphthene	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
Acenaphthylene	SVOA	18	U	18	337	U	337	342	U	342	17	U	17	340	U	340
Anthracene	SVOA	18	U	18	337	U	337	89	J	342	17	U	17	340	U	340
Benzo(a)anthracene	SVOA	21	U	21	337	U	337	605		342	20	U	20	340	U	340
Benzo(a)pyrene	SVOA	21	U	21	337	U	337	541		342	20	U	20	340	U	340
Benzo(b)fluoranthene	SVOA	28	U	28	337	U	337	523		342	26	U	26	340	U	340
Benzo(ghi)perylene	SVOA	17	U	17	337	U	337	350		342	16	U	16	340	U	340
Benzo(k)fluoranthene	SVOA	43	U	43	337	U	337	498		342	40	U	40	340	U	340
Bis(2-chloro-1-methylethyl)ether	SVOA	25	U	25	337	U	337	342	U	342	23	U	23	340	U	340
Bis(2-Chloroethoxy)methane	SVOA	25	U	25	337	U	337	342	U	342	23	U	23	340	U	340
Bis(2-chloroethyl) ether	SVOA	18	U	18	337	U	337	342	U	342	17	U	17	340	U	340
Bis(2-ethylhexyl) phthalate	SVOA	49	U	49	337	U	337	342	U	342	46	U	46	340	U	340
Butylbenzylphthalate	SVOA	46	U	46	337	U	337	342	U	342	43	U	43	340	U	340
Carbazole	SVOA	38	U	38	337	U	337	342	U	342	36	U	36	340	U	340
Chrysene	SVOA	29	U	29	337	U	337	609		342	27	U	27	340	U	340
Dibenz[a,h]anthracene	SVOA	20	U	20	337	U	337	127	J	342	19	U	19	340	U	340
Dibenzofuran	SVOA	21	U	21	337	U	337	342	U	342	20	U	20	340	U	340
Diethyl phthalate	SVOA	28	U	28	337	U	337	342	U	342	26	U	26	340	U	340
Dimethyl phthalate	SVOA	25	U	25	337	U	337	342	U	342	23	U	23	340	U	340
Di-n-butylphthalate	SVOA	31	U	31	337	U	337	342	U	342	29	U	29	340	U	340
Di-n-octylphthalate	SVOA	15	U	15	337	U	337	342	U	342	15	U	15	340	U	340
Fluoranthene	SVOA	38	U	38	337	U	337	1050		1050	36	U	36	340	U	340
Fluorene	SVOA	19	U	19	337	U	337	342	U	342	18	U	18	340	U	340
Hexachlorobenzene	SVOA	31	U	31	337	U	337	342	U	342	29	U	29	340	U	340
Hexachlorobutadiene	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
Hexachlorocyclopentadiene	SVOA	53	U	53	337	UJ	337	342	U	342	50	U	50	340	U	340
Hexachloroethane	SVOA	23	U	23	337	U	337	342	U	342	22	U	22	340	U	340
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	337	U	337	347		342	22	U	22	340	U	340
Isophorone	SVOA	18	U	18	337	U	337	342	U	342	17	U	17	340	U	340
Naphthalene	SVOA	33	U	33	337	U	337	342	U	342	31	U	31	340	U	340
Nitrobenzene	SVOA	23	U	23	337	U	337	342	U	342	22	U	22	340	U	340
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	337	U	337	342	U	342	31	U	31	340	U	340
N-Nitrosodiphenylamine	SVOA	22	U	22	337	U	337	342	U	342	21	U	21	340	U	340
Pentachlorophenol	SVOA	350	U	350	1690	UJ	1690	1710	U	1710	330	U	330	1700	U	1700
Phenanthrene	SVOA	18	U	18	337	U	337	318	J	342	17	U	17	340	U	340
Phenol	SVOA	19	U	19	337	U	337	342	U	342	18	U	18	340	U	340
Pyrene	SVOA	22	J	13	337	U	337	921		342	12	U	12	340	U	340

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-1 - J19YD1			DZ-1 re-sample 1, J1FKK1			DZ-1 re-sample 2, J1HH80			DZ-2 - J19YD2			DZ-2 re-sample 1, J1FKK2		
		5/18/10			3/16/11			4/13/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	333	UJ	333	30	U	30	29	U	29	347	UJ	347	30	U	30
1,2-Dichlorobenzene	SVOA	333	U	333	24	U	24	23	U	23	347	U	347	23	U	23
1,3-Dichlorobenzene	SVOA	333	U	332	13	U	13	12	U	12	347	U	347	13	U	13
1,4-Dichlorobenzene	SVOA	333	U	333	15	U	15	14	U	14	347	U	347	14	U	14
2,4,5-Trichlorophenol	SVOA	333	UJ	333	11	U	11	10	U	10	347	UJ	347	11	U	11
2,4,6-Trichlorophenol	SVOA	333	UJ	333	11	U	11	10	U	10	347	UJ	347	11	U	11
2,4-Dichlorophenol	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
2,4-Dimethylphenol	SVOA	333	U	333	71	U	71	69	U	69	347	U	347	70	U	70
2,4-Dinitrophenol	SVOA	1660	UJ	1660	360	U	360	350	U	350	1730	UJ	1730	350	U	350
2,4-Dinitrotoluene	SVOA	333	U	333	71	U	71	69	U	69	347	U	347	70	U	70
2,6-Dinitrotoluene	SVOA	333	U	333	30	U	30	29	U	29	347	U	347	30	U	30
2-Chloronaphthalene	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
2-Chlorophenol	SVOA	333	U	333	22	U	22	22	U	22	347	U	347	22	U	22
2-Methylnaphthalene	SVOA	333	U	333	20	U	20	20	U	20	347	U	347	20	U	20
2-Methylphenol (cresol, o-)	SVOA	333	U	333	14	U	14	14	U	14	347	U	347	14	U	14
2-Nitroaniline	SVOA	1660	U	1660	53	U	53	52	U	52	1730	U	1730	53	U	53
2-Nitrophenol	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
3,3'-Dichlorobenzidine	SVOA	665	U	665	96	U	96	94	U	94	693	U	693	95	U	95
3+4 Methylphenol (cresol, m+p)	SVOA	333	U	333	35	U	35	34	U	34	347	U	347	35	U	35
3-Nitroaniline	SVOA	1660	U	1660	78	U	78	76	U	76	1730	U	1730	77	U	77
4,6-Dinitro-2-methylphenol	SVOA	333	UJ	333	350	U	350	340	U	340	347	UJ	347	350	U	350
4-Bromophenylphenyl ether	SVOA	333	U	333	20	U	20	20	U	20	347	U	347	20	U	20
4-Chloro-3-methylphenol	SVOA	333	U	333	71	U	71	69	U	69	347	U	347	70	U	70
4-Chloroaniline	SVOA	333	U	333	87	U	87	85	U	85	347	U	347	87	U	87
4-Chlorophenylphenyl ether	SVOA	333	U	333	22	U	22	22	U	22	347	U	347	22	U	22
4-Nitroaniline	SVOA	1660	U	1660	77	U	77	75	U	75	1730	U	1730	77	U	77
4-Nitrophenol	SVOA	1660	U	1660	100	U	100	100	U	100	1730	U	1730	100	U	100
Acenaphthene	SVOA	333	U	333	11	U	11	11	U	11	347	U	347	11	U	11
Acenaphthylene	SVOA	333	U	333	18	U	18	18	U	18	347	U	347	18	U	18
Anthracene	SVOA	333	U	333	18	U	18	18	U	18	347	U	347	18	U	18
Benzo(a)anthracene	SVOA	333	U	333	26	J	21	36	J	21	347	U	347	29	J	21
Benzo(a)pyrene	SVOA	333	U	333	21	U	21	33	J	21	347	U	347	23	J	21
Benzo(b)fluoranthene	SVOA	333	U	333	43	JX	28	67	JK	27	347	U	347	47	JX	28
Benzo(ghi)perylene	SVOA	333	U	333	17	U	17	26	J	17	347	U	347	17	U	17
Benzo(k)fluoranthene	SVOA	333	U	333	43	UX	43	42	UK	42	347	U	347	42	UX	42
Bis(2-chloro-1-methylethyl)ether	SVOA	333	U	333	25	U	25	24	U	24	347	U	347	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	333	U	333	25	U	25	24	U	24	347	U	347	24	U	24
Bis(2-chloroethyl) ether	SVOA	333	U	333	18	U	18	17	U	17	347	U	347	18	U	18
Bis(2-ethylhexyl) phthalate	SVOA	333	U	333	49	U	49	94	JB	48	347	U	347	49	U	49
Butylbenzylphthalate	SVOA	333	U	333	46	U	46	45	U	45	347	U	347	46	U	46
Carbazole	SVOA	333	U	333	38	U	38	37	U	37	347	U	347	38	U	38
Chrysene	SVOA	333	U	333	29	U	29	39	J	28	347	U	347	29	J	29
Dibenz[a,h]anthracene	SVOA	333	U	333	20	U	20	20	U	20	347	U	347	20	U	20
Dibenzofuran	SVOA	333	U	333	21	U	21	21	U	21	347	U	347	21	U	21
Diethyl phthalate	SVOA	333	U	333	28	U	28	27	U	27	347	U	347	28	U	28
Dimethyl phthalate	SVOA	333	U	333	25	U	25	24	U	24	347	U	347	24	U	24
Di-n-butylphthalate	SVOA	333	U	333	31	U	31	30	U	30	347	U	347	31	U	31
Di-n-octylphthalate	SVOA	333	U	333	15	U	15	15	U	15	347	U	347	15	U	15
Fluoranthene	SVOA	333	U	333	45	J	38	59	J	37	347	U	347	40	J	38
Fluorene	SVOA	333	U	333	19	U	19	19	U	19	347	U	347	19	U	19
Hexachlorobenzene	SVOA	333	U	333	31	U	31	30	U	30	347	U	347	31	U	31
Hexachlorobutadiene	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
Hexachlorocyclopentadiene	SVOA	333	UJ	333	53	U	53	52	U	52	347	UJ	347	53	U	53
Hexachloroethane	SVOA	333	U	333	23	U	23	22	U	22	347	U	347	23	U	23
Indeno(1,2,3-cd)pyrene	SVOA	333	U	333	24	U	24	23	U	23	347	U	347	23	U	23
Isophorone	SVOA	333	U	333	18	U	18	18	U	18	347	U	347	18	U	18
Naphthalene	SVOA	333	U	333	33	U	33	32	U	32	347	U	347	33	U	33
Nitrobenzene	SVOA	333	U	333	24	U	24	23	U	23	347	U	347	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	333	U	333	33	U	33	32	U	32	347	U	347	33	U	33
N-Nitrosodiphenylamine	SVOA	333	U	333	22	U	22	22	U	22	347	U	347	22	U	22
Pentachlorophenol	SVOA	1660	UJ	1660	350	U	350	340	U	340	1730	UJ	1730	350	U	350
Phenanthrene	SVOA	333	U	333	23	J	18	25	J	18	347	U	347	18	U	18
Phenol	SVOA	333	U	333	19	U	19	19	U	19	347	U	347	19	U	19
Pyrene	SVOA	333	U	333	43	J	13	57	J	13	347	U	347	43	J	13

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-2 re-sample 2, J1HH81			DZ-3 - J19YD3			DZ-3 re-sample 1, J1FKK3			DZ-3 re-sample 2, J1HH82			DZ-4 - J19YD4		
		4/13/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	346	UJ	346	34	U	34	27	U	27	346	UJ	346
1,2-Dichlorobenzene	SVOA	22	U	22	346	U	346	26	U	26	22	U	22	346	U	346
1,3-Dichlorobenzene	SVOA	12	U	12	346	U	346	14	U	14	12	U	12	346	U	346
1,4-Dichlorobenzene	SVOA	14	U	14	346	U	346	16	U	16	13	U	13	346	U	346
2,4,5-Trichlorophenol	SVOA	10	U	10	346	UJ	346	12	U	12	9.8	U	9.8	346	UJ	346
2,4,6-Trichlorophenol	SVOA	10	U	10	346	UJ	346	12	U	12	9.8	U	9.8	346	UJ	346
2,4-Dichlorophenol	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
2,4-Dimethylphenol	SVOA	67	U	67	346	U	346	79	U	79	65	U	65	346	U	346
2,4-Dinitrophenol	SVOA	340	U	340	1730	UJ	1730	400	U	400	330	U	330	1730	UJ	1730
2,4-Dinitrotoluene	SVOA	67	U	67	346	U	346	79	U	79	65	U	65	346	U	346
2,6-Dinitrotoluene	SVOA	29	U	29	346	U	346	34	U	34	27	U	27	346	U	346
2-Chloronaphthalene	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
2-Chlorophenol	SVOA	21	U	21	346	U	346	25	U	25	21	U	21	346	U	346
2-Methylnaphthalene	SVOA	19	U	19	346	U	346	23	U	23	19	U	19	346	U	346
2-Methylphenol (cresol, o-)	SVOA	13	U	13	346	U	346	16	U	16	13	U	13	346	U	346
2-Nitroaniline	SVOA	51	U	51	1730	U	1730	60	U	60	49	U	49	1730	U	1730
2-Nitrophenol	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
3,3'-Dichlorobenzidine	SVOA	92	U	92	691	U	691	110	U	110	88	U	88	693	U	693
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	346	U	346	40	U	40	32	U	32	346	U	346
3-Nitroaniline	SVOA	75	U	75	1730	U	1730	88	U	88	72	U	72	1730	U	1730
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	346	UJ	346	400	U	400	320	U	320	346	UJ	346
4-Bromophenylphenyl ether	SVOA	19	U	19	346	U	346	23	U	23	19	U	19	346	U	346
4-Chloro-3-methylphenol	SVOA	67	U	67	346	U	346	79	U	79	65	U	65	346	U	346
4-Chloroaniline	SVOA	84	U	84	346	U	346	98	U	98	80	U	80	346	U	346
4-Chlorophenylphenyl ether	SVOA	21	U	21	346	U	346	25	U	25	21	U	21	346	U	346
4-Nitroaniline	SVOA	74	U	74	1730	U	1730	87	U	87	71	U	71	1730	U	1730
4-Nitrophenol	SVOA	99	U	99	1730	U	1730	120	U	120	95	U	95	1730	U	1730
Acenaphthene	SVOA	11	U	11	346	U	346	12	U	12	10	U	10	346	U	346
Acenaphthylene	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Anthracene	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Benzo(a)anthracene	SVOA	20	U	20	346	U	346	24	U	24	20	U	20	346	U	346
Benzo(a)pyrene	SVOA	20	U	20	346	U	346	24	U	24	20	U	20	346	U	346
Benzo(b)fluoranthene	SVOA	27	U	27	346	U	346	31	U	31	26	U	26	346	U	346
Benzo(ghi)perylene	SVOA	16	U	16	346	U	346	19	U	19	16	U	16	346	U	346
Benzo(k)fluoranthene	SVOA	41	U	41	346	U	346	48	U	48	39	U	39	346	U	346
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	346	U	346	28	U	28	23	U	23	346	U	346
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	346	U	346	28	U	28	23	U	23	346	U	346
Bis(2-chloroethyl) ether	SVOA	17	U	17	346	U	346	20	U	20	16	U	16	346	U	346
Bis(2-ethylhexyl) phthalate	SVOA	80	JB	47	346	U	346	55	U	55	72	JB	45	346	U	346
Butylbenzylphthalate	SVOA	44	U	44	346	U	346	52	U	52	42	U	42	346	U	346
Carbazole	SVOA	37	U	37	346	U	346	43	U	43	35	U	35	346	U	346
Chrysene	SVOA	28	U	28	53.9	J	346	32	U	32	26	U	26	346	U	346
Dibenz[a,h]anthracene	SVOA	19	U	19	346	U	346	23	U	23	19	U	19	346	U	346
Dibenzofuran	SVOA	20	U	20	346	U	346	24	U	24	20	U	20	346	U	346
Diethyl phthalate	SVOA	27	U	27	346	U	346	31	U	31	25	U	25	346	U	346
Dimethyl phthalate	SVOA	24	U	24	346	U	346	28	U	28	23	U	23	346	U	346
Di-n-butylphthalate	SVOA	30	U	30	346	U	346	35	U	35	28	U	28	346	U	346
Di-n-octylphthalate	SVOA	15	U	15	346	U	346	17	U	17	14	U	14	346	U	346
Fluoranthene	SVOA	37	U	37	85.7	J	85.7	43	U	43	35	U	35	58.1	J	346
Fluorene	SVOA	18	U	18	346	U	346	22	U	22	18	U	18	346	U	346
Hexachlorobenzene	SVOA	30	U	30	346	U	346	35	U	35	28	U	28	346	U	346
Hexachlorobutadiene	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
Hexachlorocyclopentadiene	SVOA	51	U	51	346	UJ	346	60	U	60	49	U	49	346	UJ	346
Hexachloroethane	SVOA	22	U	22	346	U	346	26	U	26	21	U	21	346	U	346
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	346	U	346	26	U	26	22	U	22	346	U	346
Isophorone	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Naphthalene	SVOA	32	U	32	346	U	346	37	U	37	30	U	30	346	U	346
Nitrobenzene	SVOA	22	U	22	346	U	346	26	U	26	22	U	22	346	U	346
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	346	U	346	37	U	37	30	U	30	346	U	346
N-Nitrosodiphenylamine	SVOA	21	U	21	346	U	346	25	U	25	21	U	21	346	U	346
Pentachlorophenol	SVOA	340	U	340	1730	UJ	1730	400	U	400	320	U	320	1730	UJ	1730
Phenanthrene	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Phenol	SVOA	18	U	18	346	U	346	25	J	22	18	U	18	346	U	346
Pyrene	SVOA	12	U	12	85.4	J	346	16	J	15	12	U	12	52.9	J	346

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Originator	J. D. Skoglie	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-4 re-sample 1, J1FKK4			DZ-4 re-sample 2, J1HH83			DZ-5 - J19YD5			DZ-5 re-sample 1, J1FKK5			DZ-6 - J19YD6		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	27	U	27	343	UJ	343	29	U	29	331	UJ	331
1,2-Dichlorobenzene	SVOA	23	U	23	22	U	22	343	U	343	23	U	23	331	U	331
1,3-Dichlorobenzene	SVOA	13	U	13	12	U	12	343	U	343	13	U	13	331	U	331
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	343	U	343	14	U	14	331	U	331
2,4,5-Trichlorophenol	SVOA	10	U	10	9.8	U	9.8	343	UJ	343	11	U	11	331	UJ	331
2,4,6-Trichlorophenol	SVOA	10	U	10	9.8	U	9.8	343	UJ	343	11	U	11	331	UJ	331
2,4-Dichlorophenol	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
2,4-Dimethylphenol	SVOA	69	U	69	65	U	65	343	U	343	69	U	69	331	U	331
2,4-Dinitrophenol	SVOA	350	U	350	330	U	330	1720	UJ	1720	350	U	350	1660	UJ	1660
2,4-Dinitrotoluene	SVOA	69	U	69	65	U	65	343	U	343	69	U	69	331	U	331
2,6-Dinitrotoluene	SVOA	29	U	29	27	U	27	343	U	343	29	U	29	331	U	331
2-Chloronaphthalene	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
2-Chlorophenol	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
2-Methylnaphthalene	SVOA	20	U	20	19	U	19	343	U	343	20	U	20	331	U	331
2-Methylphenol (cresol, o-)	SVOA	14	U	14	13	U	13	343	U	343	14	U	14	331	U	331
2-Nitroaniline	SVOA	52	U	52	49	U	49	1720	U	1720	53	U	53	1660	U	1660
2-Nitrophenol	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
3,3'-Dichlorobenzidine	SVOA	94	U	94	88	U	88	687	U	687	95	U	95	662	U	662
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	32	U	32	343	U	343	35	U	35	331	U	331
3-Nitroaniline	SVOA	76	U	76	71	U	71	1720	U	1720	77	U	77	1660	U	1660
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	320	U	320	343	UJ	343	350	U	350	331	UJ	331
4-Bromophenylphenyl ether	SVOA	20	U	20	19	U	19	343	U	343	20	U	20	331	U	331
4-Chloro-3-methylphenol	SVOA	69	U	69	65	U	65	343	U	343	69	U	69	331	U	331
4-Chloroaniline	SVOA	86	U	86	80	U	80	343	U	343	86	U	86	331	U	331
4-Chlorophenylphenyl ether	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
4-Nitroaniline	SVOA	76	U	76	71	U	71	1720	U	1720	76	U	76	1660	U	1660
4-Nitrophenol	SVOA	100	U	100	95	U	95	1720	U	1720	100	U	100	1660	U	1660
Acenaphthene	SVOA	11	U	11	10	U	10	343	U	343	11	U	11	331	U	331
Acenaphthylene	SVOA	18	U	18	17	U	17	343	U	343	18	U	18	331	U	331
Anthracene	SVOA	18	U	18	17	U	17	343	U	343	18	U	18	92.2	J	331
Benzo(a)anthracene	SVOA	21	U	21	69	J	20	343	U	343	21	U	21	212	J	331
Benzo(a)pyrene	SVOA	21	U	21	60	J	20	343	U	343	21	U	21	164	J	331
Benzo(b)fluoranthene	SVOA	27	U	27	150	JK	26	343	U	343	28	U	28	152	J	331
Benzo(ghi)perylene	SVOA	17	U	17	50	J	16	343	U	343	17	U	17	119	J	331
Benzo(k)fluoranthene	SVOA	42	U	42	39	UK	39	343	U	343	42	U	42	158	J	331
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	23	U	23	343	U	343	24	U	24	331	U	331
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	23	U	23	343	U	343	24	U	24	331	U	331
Bis(2-chloroethyl) ether	SVOA	17	U	17	16	U	16	343	U	343	17	U	17	331	U	331
Bis(2-ethylhexyl) phthalate	SVOA	48	U	48	89	JB	45	343	U	343	48	U	48	331	U	331
Butylbenzylphthalate	SVOA	45	U	45	42	U	42	343	U	343	45	U	45	331	U	331
Carbazole	SVOA	38	U	38	35	U	35	343	U	343	38	U	38	331	U	331
Chrysene	SVOA	28	U	28	67	J	26	343	U	343	28	U	28	219	J	331
Dibenz[a,h]anthracene	SVOA	20	U	20	19	U	19	343	U	343	20	U	20	331	U	331
Dibenzofuran	SVOA	21	U	21	20	U	20	343	U	343	21	U	21	331	U	331
Diethyl phthalate	SVOA	27	U	27	25	U	25	343	U	343	27	U	27	331	U	331
Dimethyl phthalate	SVOA	24	U	24	23	U	23	343	U	343	24	U	24	331	U	331
Di-n-butylphthalate	SVOA	30	U	30	28	U	28	343	U	343	30	U	30	331	U	331
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	343	U	343	15	U	15	331	U	331
Fluoranthene	SVOA	38	U	38	81	J	35	343	U	343	38	U	38	543		331
Fluorene	SVOA	19	U	19	18	U	18	343	U	343	19	U	19	331	U	331
Hexachlorobenzene	SVOA	30	U	30	28	U	28	343	U	343	30	U	30	331	U	331
Hexachlorobutadiene	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
Hexachlorocyclopentadiene	SVOA	52	U	52	49	U	49	343	UJ	343	53	U	53	331	UJ	331
Hexachloroethane	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	42	J	22	343	U	343	23	U	23	102	J	331
Isophorone	SVOA	18	U	18	17	U	17	343	U	343	18	U	18	331	U	331
Naphthalene	SVOA	32	U	32	30	U	30	343	U	343	33	U	33	331	U	331
Nitrobenzene	SVOA	23	U	23	22	U	22	343	U	343	23	U	23	331	U	331
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	30	U	30	343	U	343	33	U	33	331	U	331
N-Nitrosodiphenylamine	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
Pentachlorophenol	SVOA	350	U	350	320	U	320	1720	UJ	1720	350	U	350	1660	UJ	1660
Phenanthrene	SVOA	18	U	18	21	J	17	343	U	343	18	U	18	408		331
Phenol	SVOA	19	U	19	18	U	18	343	U	343	19	U	19	331	U	331
Pyrene	SVOA	13	U	13	84	J	12	343	U	343	13	U	13	335		331

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-6 re-sample 1, J1FKK6			DZ-7 - J19YD7			DZ-7 re-sample 1, J1FKK7			DZ-7 re-sample 2, J1HH84			DZ-8 - J19YD8		
		3/16/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	344	UJ	344	30	U	30	29	U	29	349	UJ	349
1,2-Dichlorobenzene	SVOA	22	U	22	344	U	344	23	U	23	23	U	23	349	U	349
1,3-Dichlorobenzene	SVOA	12	U	12	344	U	344	13	U	13	13	U	13	349	U	349
1,4-Dichlorobenzene	SVOA	14	U	14	344	U	344	14	U	14	14	U	14	349	U	349
2,4,5-Trichlorophenol	SVOA	10	U	10	344	UJ	344	11	U	11	11	U	11	349	UJ	349
2,4,6-Trichlorophenol	SVOA	10	U	10	344	UJ	344	11	U	11	11	U	11	349	UJ	349
2,4-Dichlorophenol	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
2,4-Dimethylphenol	SVOA	67	U	67	344	U	344	70	U	70	69	U	69	349	U	349
2,4-Dinitrophenol	SVOA	340	U	340	1720	UJ	1720	350	U	350	350	U	350	1740	UJ	1740
2,4-Dinitrotoluene	SVOA	67	U	67	344	U	344	70	U	70	69	U	69	349	U	349
2,6-Dinitrotoluene	SVOA	28	U	28	344	U	344	30	U	30	29	U	29	349	U	349
2-Chloronaphthalene	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
2-Chlorophenol	SVOA	21	U	21	344	U	344	22	U	22	22	U	22	349	U	349
2-Methylnaphthalene	SVOA	19	U	19	344	U	344	20	U	20	20	U	20	349	U	349
2-Methylphenol (cresol, o-)	SVOA	13	U	13	344	U	344	14	U	14	14	U	14	349	U	349
2-Nitroaniline	SVOA	51	U	51	1720	U	1720	53	U	53	53	U	53	1740	U	1740
2-Nitrophenol	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
3,3'-Dichlorobenzidine	SVOA	91	U	91	689	U	689	96	U	96	95	U	95	698	U	698
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	344	U	344	35	U	35	35	U	35	349	U	349
3-Nitroaniline	SVOA	74	U	74	1720	U	1720	77	U	77	77	U	77	1740	U	1740
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	344	UJ	344	350	U	350	350	U	350	349	UJ	349
4-Bromophenylphenyl ether	SVOA	19	U	19	344	U	344	20	U	20	20	U	20	349	U	349
4-Chloro-3-methylphenol	SVOA	67	U	67	344	U	344	70	U	70	69	U	69	349	U	349
4-Chloroaniline	SVOA	83	U	83	344	U	344	87	U	87	86	U	86	349	U	349
4-Chlorophenylphenyl ether	SVOA	21	U	21	344	U	344	22	U	22	22	U	22	349	U	349
4-Nitroaniline	SVOA	74	U	74	1720	U	1720	77	U	77	76	U	76	1740	U	1740
4-Nitrophenol	SVOA	99	U	99	1720	U	1720	100	U	100	100	U	100	1740	U	1740
Acenaphthene	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
Acenaphthylene	SVOA	17	U	17	344	U	344	18	U	18	18	U	18	349	U	349
Anthracene	SVOA	17	U	17	344	U	344	18	U	18	18	U	18	349	U	349
Benzo(a)anthracene	SVOA	20	U	20	682		344	30	J	21	21	U	21	349	U	349
Benzo(a)pyrene	SVOA	20	U	20	515		344	36	J	21	21	U	21	349	U	349
Benzo(b)fluoranthene	SVOA	27	U	27	666		344	51	JX	28	28	U	28	349	U	349
Benzo(ghi)perylene	SVOA	16	U	16	481		344	17	U	17	17	U	17	349	U	349
Benzo(k)fluoranthene	SVOA	41	U	41	566		344	42	UX	42	42	U	42	349	U	349
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	344	U	344	24	U	24	24	U	24	349	U	349
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	344	U	344	24	U	24	24	U	24	349	U	349
Bis(2-chloroethyl) ether	SVOA	17	U	17	344	U	344	18	U	18	17	U	17	349	U	349
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	344	U	344	49	U	49	78	JB	48	349	U	349
Butylbenzylphthalate	SVOA	44	U	44	344	U	344	46	U	46	45	U	45	349	U	349
Carbazole	SVOA	37	U	37	344	U	344	38	U	38	38	U	38	349	U	349
Chrysene	SVOA	27	U	27	724		344	35	J	29	28	U	28	349	U	349
Dibenz[a,h]anthracene	SVOA	19	U	19	134	J	344	20	U	20	20	U	20	349	U	349
Dibenzofuran	SVOA	20	U	20	344	U	344	21	U	21	21	U	21	349	U	349
Diethyl phthalate	SVOA	26	U	26	344	U	344	28	U	28	27	U	27	349	U	349
Dimethyl phthalate	SVOA	23	U	23	344	U	344	24	U	24	24	U	24	349	U	349
Di-n-butylphthalate	SVOA	29	U	29	344	U	344	31	U	31	30	U	30	349	U	349
Di-n-octylphthalate	SVOA	15	U	15	344	U	344	15	U	15	15	U	15	349	U	349
Fluoranthene	SVOA	37	U	37	954		344	57	J	38	38	U	38	349	U	349
Fluorene	SVOA	18	U	18	344	U	344	19	U	19	19	U	19	349	U	349
Hexachlorobenzene	SVOA	29	U	29	344	U	344	31	U	31	30	U	30	349	U	349
Hexachlorobutadiene	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
Hexachlorocyclopentadiene	SVOA	51	U	51	344	UJ	344	53	U	53	53	U	53	349	UJ	349
Hexachloroethane	SVOA	22	U	22	344	U	344	23	U	23	22	U	22	349	U	349
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	397		344	23	U	23	23	U	23	349	U	349
Isophorone	SVOA	17	U	17	344	U	344	18	U	18	18	U	18	349	U	349
Naphthalene	SVOA	31	U	31	344	U	344	33	U	33	33	U	33	349	U	349
Nitrobenzene	SVOA	22	U	22	344	U	344	23	U	23	23	U	23	349	U	349
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	344	U	344	33	U	33	33	U	33	349	U	349
N-Nitrosodiphenylamine	SVOA	21	U	21	344	U	344	22	U	22	22	U	22	349	U	349
Pentachlorophenol	SVOA	340	U	340	1720	UJ	1720	350	U	350	350	U	350	1740	UJ	1740
Phenanthrene	SVOA	17	U	17	78.4	J	344	39	J	18	18	U	18	349	U	349
Phenol	SVOA	18	U	18	344	U	344	19	U	19	19	U	19	349	U	349
Pyrene	SVOA	12	U	12	868		344	68	J	13	13	U	13	349	U	349

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CONSTITUENT	CLASS	DZ-8 re-sample 1, J1FKK8			DZ-8 re-sample 2, J1HH85			DZ-9 - J19YD9			DZ-9 re-sample 1, J1FKK9			DZ-10 - J19YF0		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	28	U	28	335	UJ	335	27	U	27	343	UJ	343
1,2-Dichlorobenzene	SVOA	23	U	23	22	U	22	335	U	335	22	U	22	343	U	343
1,3-Dichlorobenzene	SVOA	13	U	13	12	U	12	335	U	335	12	U	12	343	U	343
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	335	U	335	13	U	13	343	U	343
2,4,5-Trichlorophenol	SVOA	11	U	11	10	U	10	335	UJ	335	9.8	U	9.8	343	UJ	343
2,4,6-Trichlorophenol	SVOA	11	U	11	10	U	10	335	UJ	335	9.8	U	9.8	343	UJ	343
2,4-Dichlorophenol	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
2,4-Dimethylphenol	SVOA	70	U	70	67	U	67	335	U	335	65	U	65	343	U	343
2,4-Dinitrophenol	SVOA	350	U	350	340	U	340	1680	UJ	1680	330	U	330	1720	UJ	1720
2,4-Dinitrotoluene	SVOA	70	U	70	67	U	67	335	U	335	65	U	65	343	U	343
2,6-Dinitrotoluene	SVOA	30	U	30	28	U	28	335	U	335	27	U	27	343	U	343
2-Chloronaphthalene	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
2-Chlorophenol	SVOA	22	U	22	21	U	21	335	U	335	21	U	21	343	U	343
2-Methylnaphthalene	SVOA	20	U	20	19	U	19	335	U	335	19	U	19	343	U	343
2-Methylphenol (cresol, o-)	SVOA	14	U	14	13	U	13	335	U	335	13	U	13	343	U	343
2-Nitroaniline	SVOA	53	U	53	51	U	51	1680	U	1680	49	U	49	1720	U	1720
2-Nitrophenol	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
3,3'-Dichlorobenzidine	SVOA	95	U	95	91	U	91	670	U	670	88	U	88	687	U	687
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	34	U	34	335	U	335	32	U	32	343	U	343
3-Nitroaniline	SVOA	77	U	77	74	U	74	1680	U	1680	71	U	71	1720	U	1720
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	340	U	340	335	UJ	335	320	U	320	343	UJ	343
4-Bromophenylphenyl ether	SVOA	20	U	20	19	U	19	335	U	335	19	U	19	343	U	343
4-Chloro-3-methylphenol	SVOA	70	U	70	67	U	67	335	U	335	65	U	65	343	U	343
4-Chloroaniline	SVOA	86	U	86	83	U	83	335	U	335	80	U	80	343	U	343
4-Chlorophenylphenyl ether	SVOA	22	U	22	21	U	21	335	U	335	21	U	21	343	U	343
4-Nitroaniline	SVOA	76	U	76	74	U	74	1680	U	1680	71	U	71	1720	U	1720
4-Nitrophenol	SVOA	100	U	100	98	U	98	1680	U	1680	95	U	95	1720	U	1720
Acenaphthene	SVOA	11	U	11	10	U	10	335	U	335	10	U	10	343	U	343
Acenaphthylene	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Anthracene	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Benzo(a)anthracene	SVOA	21	U	21	20	U	20	335	U	335	20	U	20	343	U	343
Benzo(a)pyrene	SVOA	21	U	21	20	U	20	335	U	335	20	U	20	343	U	343
Benzo(b)fluoranthene	SVOA	28	U	28	27	U	27	335	U	335	26	U	26	343	U	343
Benzo(ghi)perylene	SVOA	17	U	17	16	U	16	335	U	335	16	U	16	343	U	343
Benzo(k)fluoranthene	SVOA	42	U	42	41	U	41	335	U	335	39	U	39	343	U	343
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	23	U	23	335	U	335	23	U	23	343	U	343
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	23	U	23	335	U	335	23	U	23	343	U	343
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	335	U	335	16	U	16	343	U	343
Bis(2-ethylhexyl) phthalate	SVOA	48	U	48	69	JB	47	335	U	335	45	U	45	343	U	343
Butylbenzylphthalate	SVOA	45	U	45	44	U	44	335	U	335	42	U	42	343	U	343
Carbazole	SVOA	38	U	38	37	U	37	335	U	335	35	U	35	343	U	343
Chrysene	SVOA	28	U	28	27	U	27	335	U	335	26	U	26	343	U	343
Dibenz[a,h]anthracene	SVOA	20	U	20	19	U	19	335	U	335	19	U	19	343	U	343
Dibenzofuran	SVOA	21	U	21	20	U	20	335	U	335	20	U	20	343	U	343
Diethyl phthalate	SVOA	27	U	27	26	U	26	335	U	335	25	U	25	343	U	343
Dimethyl phthalate	SVOA	24	U	24	23	U	23	335	U	335	23	U	23	343	U	343
Di-n-butylphthalate	SVOA	31	U	31	29	U	29	335	U	335	28	U	28	343	U	343
Di-n-octylphthalate	SVOA	15	U	15	15	U	15	335	U	335	14	U	14	343	U	343
Fluoranthene	SVOA	38	U	38	37	U	37	335	U	335	35	U	35	343	U	343
Fluorene	SVOA	19	U	19	18	U	18	335	U	335	18	U	18	343	U	343
Hexachlorobenzene	SVOA	31	U	31	29	U	29	335	U	335	28	U	28	343	U	343
Hexachlorobutadiene	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
Hexachlorocyclopentadiene	SVOA	53	U	53	51	U	51	335	UJ	335	49	U	49	343	UJ	343
Hexachloroethane	SVOA	22	U	22	22	U	22	335	U	335	21	U	21	343	U	343
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	22	U	22	335	U	335	22	U	22	343	U	343
Isophorone	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Naphthalene	SVOA	33	U	33	31	U	31	335	U	335	30	U	30	343	U	343
Nitrobenzene	SVOA	23	U	23	22	U	22	335	U	335	22	U	22	343	U	343
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	31	U	31	335	U	335	30	U	30	343	U	343
N-Nitrosodiphenylamine	SVOA	22	U	22	21	U	21	335	U	335	21	U	21	343	U	343
Pentachlorophenol	SVOA	350	U	350	340	U	340	1680	UJ	1680	320	U	320	1720	UJ	1720
Phenanthrene	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Phenol	SVOA	19	U	19	18	U	18	335	U	335	18	U	18	343	U	343
Pyrene	SVOA	13	U	13	12	U	12	335	U	335	12	U	12	343	U	343

Attachment	1	Sheet No.	51 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-10 re-sample 1, J1FKL0			DZ-11 - J19YF1			DZ-11 re-sample 1, J1FKL1			DZ-12 - J19YF2			DZ-12 re-sample 1, J1FKL2		
		3/16/11			5/18/10			3/16/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	350	U	350	31	U	31	340	U	340	29	U	29
1,2-Dichlorobenzene	SVOA	22	U	22	350	U	350	24	U	24	340	U	340	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	350	U	350	13	U	13	340	U	340	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	350	U	350	15	U	15	340	U	340	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2,4,6-Trichlorophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2,4-Dichlorophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2,4-Dimethylphenol	SVOA	67	U	67	350	U	350	73	U	73	340	U	340	69	U	69
2,4-Dinitrophenol	SVOA	340	U	340	1750	U	1750	370	U	370	1700	U	1700	350	U	350
2,4-Dinitrotoluene	SVOA	67	U	67	350	U	350	73	U	73	340	U	340	69	U	69
2,6-Dinitrotoluene	SVOA	29	U	29	350	U	350	31	U	31	340	U	340	29	U	29
2-Chloronaphthalene	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2-Chlorophenol	SVOA	21	U	21	350	U	350	23	U	23	340	U	340	22	U	22
2-Methylnaphthalene	SVOA	19	U	19	350	U	350	21	U	21	340	U	340	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	350	U	350	14	U	14	340	U	340	14	U	14
2-Nitroaniline	SVOA	51	U	51	1750	U	1750	55	U	55	1700	U	1700	52	U	52
2-Nitrophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
3,3'-Dichlorobenzidine	SVOA	92	U	92	700	U	700	99	U	99	679	U	679	94	U	94
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	350	U	350	36	U	36	340	U	340	34	U	34
3-Nitroaniline	SVOA	74	U	74	1750	U	1750	80	U	80	1700	U	1700	76	U	76
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	350	U	350	360	U	360	340	U	340	340	U	340
4-Bromophenylphenyl ether	SVOA	19	U	19	350	U	350	21	U	21	340	U	340	20	U	20
4-Chloro-3-methylphenol	SVOA	67	U	67	350	U	350	73	U	73	340	U	340	69	U	69
4-Chloroaniline	SVOA	83	U	83	350	U	350	90	U	90	340	U	340	85	U	85
4-Chlorophenylphenyl ether	SVOA	21	U	21	350	U	350	23	U	23	340	U	340	22	U	22
4-Nitroaniline	SVOA	74	U	74	1750	U	1750	80	U	80	1700	U	1700	76	U	76
4-Nitrophenol	SVOA	99	U	99	1750	U	1750	110	U	110	1700	U	1700	100	U	100
Acenaphthene	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	11	U	11
Acenaphthylene	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Anthracene	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Benzo(a)anthracene	SVOA	20	U	20	350	U	350	22	U	22	340	U	340	21	U	21
Benzo(a)pyrene	SVOA	20	U	20	350	U	350	22	U	22	340	U	340	21	U	21
Benzo(b)fluoranthene	SVOA	27	U	27	350	U	350	29	U	29	340	U	340	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	350	U	350	18	U	18	340	U	340	17	U	17
Benzo(k)fluoranthene	SVOA	41	U	41	350	U	350	44	U	44	55.4	J	340	42	U	42
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	350	U	350	25	U	25	340	U	340	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	350	U	350	25	U	25	340	U	340	24	U	24
Bis(2-chloroethyl) ether	SVOA	17	U	17	350	U	350	18	U	18	340	U	340	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	350	U	350	51	U	51	340	U	340	48	U	48
Butylbenzylphthalate	SVOA	44	U	44	350	U	350	47	U	47	340	U	340	45	U	45
Carbazole	SVOA	37	U	37	350	U	350	40	U	40	340	U	340	37	U	37
Chrysene	SVOA	28	U	28	350	U	350	30	U	30	54.1	J	340	28	U	28
Dibenz[a,h]anthracene	SVOA	19	U	19	350	U	350	21	U	21	340	U	340	20	U	20
Dibenzofuran	SVOA	20	U	20	350	U	350	22	U	22	340	U	340	21	U	21
Diethyl phthalate	SVOA	27	U	27	350	U	350	29	U	29	340	U	340	27	U	27
Dimethyl phthalate	SVOA	23	U	23	350	U	350	25	U	25	340	U	340	24	U	24
Di-n-butylphthalate	SVOA	30	U	30	350	U	350	32	U	32	340	U	340	30	U	30
Di-n-octylphthalate	SVOA	15	U	15	350	U	350	16	U	16	340	U	340	15	U	15
Fluoranthene	SVOA	37	U	37	350	U	350	40	U	40	78.6	J	340	37	U	37
Fluorene	SVOA	18	U	18	350	U	350	20	U	20	340	U	340	19	U	19
Hexachlorobenzene	SVOA	30	U	30	350	U	350	32	U	32	340	U	340	30	U	30
Hexachlorobutadiene	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
Hexachlorocyclopentadiene	SVOA	51	U	51	350	U	350	55	U	55	340	U	340	52	U	52
Hexachloroethane	SVOA	22	U	22	350	U	350	23	U	23	340	U	340	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	350	U	350	24	U	24	340	U	340	23	U	23
Isophorone	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Naphthalene	SVOA	32	U	32	350	U	350	34	U	34	340	U	340	32	U	32
Nitrobenzene	SVOA	22	U	22	350	U	350	24	U	24	340	U	340	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	350	U	350	34	U	34	340	U	340	32	U	32
N-Nitrosodiphenylamine	SVOA	21	U	21	350	U	350	23	U	23	340	U	340	22	U	22
Pentachlorophenol	SVOA	340	U	340	1750	U	1750	360	U	360	1700	U	1700	340	U	340
Phenanthrene	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Phenol	SVOA	18	U	18	350	U	350	20	U	20	340	U	340	19	U	19
Pyrene	SVOA	12	U	12	350	U	350	13	U	13	78.1	J	340	13	U	13

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J19YD1 - J19YF3 5/18/10			Duplicate of J1FKK8, J1FKL3 3/16/11			Duplicate of J1HH85 re-sample 2, J1HH86 4/13/11			Equipment Blank - J19YK0 5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	343	U	343	30	U	30	29	U	29	334	U	334
1,2-Dichlorobenzene	SVOA	343	U	343	24	U	24	23	U	23	334	U	334
1,3-Dichlorobenzene	SVOA	343	U	343	13	U	13	12	U	12	334	U	334
1,4-Dichlorobenzene	SVOA	343	U	343	15	U	15	14	U	14	334	U	334
2,4,5-Trichlorophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2,4,6-Trichlorophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2,4-Dichlorophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2,4-Dimethylphenol	SVOA	343	U	343	71	U	71	68	U	68	334	U	334
2,4-Dinitrophenol	SVOA	1720	U	1720	360	U	360	340	U	340	1670	U	1670
2,4-Dinitrotoluene	SVOA	343	U	343	71	U	71	68	U	68	334	U	334
2,6-Dinitrotoluene	SVOA	343	U	343	30	U	30	29	U	29	334	U	334
2-Chloronaphthalene	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2-Chlorophenol	SVOA	343	U	343	22	U	22	22	U	22	334	U	334
2-Methylnaphthalene	SVOA	343	U	343	20	U	20	19	U	19	334	U	334
2-Methylphenol (cresol, o-)	SVOA	343	U	343	14	U	14	13	U	13	334	U	334
2-Nitroaniline	SVOA	1720	U	1720	54	U	54	51	U	51	1670	U	1670
2-Nitrophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
3,3'-Dichlorobenzidine	SVOA	687	U	687	96	U	96	92	U	92	668	U	668
3+4 Methylphenol (cresol, m+p)	SVOA	343	U	343	35	U	35	34	U	34	334	U	334
3-Nitroaniline	SVOA	1720	U	1720	78	U	78	75	U	75	1670	U	1670
4,6-Dinitro-2-methylphenol	SVOA	343	U	343	350	U	350	340	U	340	334	U	334
4-Bromophenylphenyl ether	SVOA	343	U	343	20	U	20	19	U	19	334	U	334
4-Chloro-3-methylphenol	SVOA	343	U	343	71	U	71	68	U	68	334	U	334
4-Chloroaniline	SVOA	343	U	343	88	U	88	84	U	84	334	U	334
4-Chlorophenylphenyl ether	SVOA	343	U	343	22	U	22	22	U	22	334	U	334
4-Nitroaniline	SVOA	1720	U	1720	78	U	78	74	U	74	1670	U	1670
4-Nitrophenol	SVOA	1720	U	1720	100	U	100	99	U	99	1670	U	1670
Acenaphthene	SVOA	343	U	343	11	U	11	11	U	11	334	U	334
Acenaphthylene	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Anthracene	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Benzo(a)anthracene	SVOA	343	U	343	21	U	21	20	U	20	334	U	334
Benzo(a)pyrene	SVOA	343	U	343	21	U	21	20	U	20	334	U	334
Benzo(b)fluoranthene	SVOA	343	U	343	28	U	28	27	U	27	334	U	334
Benzo(ghi)perylene	SVOA	343	U	343	17	U	17	16	U	16	334	U	334
Benzo(k)fluoranthene	SVOA	343	U	343	43	U	43	41	U	41	334	U	334
Bis(2-chloro-1-methylethyl)ether	SVOA	343	U	343	25	U	25	24	U	24	334	U	334
Bis(2-Chloroethoxy)methane	SVOA	343	U	343	25	U	25	24	U	24	334	U	334
Bis(2-chloroethyl) ether	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Bis(2-ethylhexyl) phthalate	SVOA	343	U	343	49	U	49	83	JB	47	334	U	334
Butylbenzylphthalate	SVOA	343	U	343	46	U	46	44	U	44	334	U	334
Carbazole	SVOA	343	U	343	39	U	39	37	U	37	334	U	334
Chrysene	SVOA	343	U	343	29	U	29	28	U	28	334	U	334
Dibenz[a,h]anthracene	SVOA	343	U	343	20	U	20	19	U	19	334	U	334
Dibenzofuran	SVOA	343	U	343	21	U	21	20	U	20	334	U	334
Diethyl phthalate	SVOA	343	U	343	28	U	28	27	U	27	116	J	334
Dimethyl phthalate	SVOA	343	U	343	25	U	25	24	U	24	334	U	334
Di-n-butylphthalate	SVOA	343	U	343	31	U	31	30	U	30	58.7	J	334
Di-n-octylphthalate	SVOA	343	U	343	15	U	15	15	U	15	334	U	334
Fluoranthene	SVOA	343	U	343	39	U	39	37	U	37	334	U	334
Fluorene	SVOA	343	U	343	19	U	19	18	U	18	334	U	334
Hexachlorobenzene	SVOA	343	U	343	31	U	31	30	U	30	334	U	334
Hexachlorobutadiene	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
Hexachlorocyclopentadiene	SVOA	343	U	343	54	U	54	51	U	51	334	U	334
Hexachloroethane	SVOA	343	U	343	23	U	23	22	U	22	334	U	334
Indeno(1,2,3-cd)pyrene	SVOA	343	U	343	24	U	24	23	U	23	334	U	334
Isophorone	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Naphthalene	SVOA	343	U	343	33	U	33	32	U	32	334	U	334
Nitrobenzene	SVOA	343	U	343	24	U	24	23	U	23	334	U	334
N-Nitroso-di-n-dipropylamine	SVOA	343	U	343	33	U	33	32	U	32	334	U	334
N-Nitrosodiphenylamine	SVOA	343	U	343	22	U	22	22	U	22	334	U	334
Pentachlorophenol	SVOA	1720	U	1720	350	U	350	340	U	340	1670	U	1670
Phenanthrene	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Phenol	SVOA	343	U	343	19	U	19	18	U	18	334	U	334
Pyrene	SVOA	343	U	343	13	U	13	12	U	12	334	U	334

Attachment	1	Sheet No.	53 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-5 - J19YF8			Duplicate of J19YF8 - J19YH6			OB-1 - J19YF4			OB-2 - J19YF5			OB-3 - J19YF6		
		5/13/10			5/13/10			5/13/10			5/13/10			5/13/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Acenaphthylene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Anthracene	PAH	1.66	J	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Benzo(a)anthracene	PAH	5.88		3.25	4.07		3.25	3.35	U	3.35	3.26	U	3.26	0.974	J	3.35
Benzo(a)pyrene	PAH	7.38		3.25	4.25		3.25	3.35	U	3.35	1.24	J	3.26	1.7	J	3.35
Benzo(b)fluoranthene	PAH	8.77		3.25	7.52		3.25	3.35	U	3.35	3.26	U	3.26	1.44	J	3.35
Benzo(ghi)perylene	PAH	4.89		3.25	3.03	J	3.25	3.35	U	3.35	3.26	U	3.26	1.56	J	3.35
Benzo(k)fluoranthene	PAH	3.72		3.25	2.31	J	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Chrysene	PAH	3.77		3.25	1.17	J	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Dibenz[a,h]anthracene	PAH	0.894	J	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Fluoranthene	PAH	21		3.25	9.18		3.25	3.98		3.35	1.39	J	3.26	6.45		3.35
Fluorene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Indeno(1,2,3-cd)pyrene	PAH	5.72		3.25	4.02		3.25	0.839	J	3.35	1.08	J	3.26	1.56	J	3.35
Naphthalene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Phenanthrene	PAH	6.78		3.25	3.08	J	3.25	1.31	J	3.35	1.19	J	3.26	1.38	J	3.35
Pyrene	PAH	17.2		3.25	7.13		3.25	1.44	J	3.35	1.27	J	3.26	3.14	J	3.35
Aroclor-1016	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1221	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1232	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1242	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1248	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1254	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1260	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aldrin	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Alpha-BHC	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
alpha-Chlordane	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Beta-BHC	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Delta-BHC	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
4,4'-DDD	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
4,4'-DDE	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
4,4'-DDT	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Dieldrin	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endosulfan I	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endosulfan II	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endosulfan sulfate	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endrin	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endrin aldehyde	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endrin ketone	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
gamma-Chlordane	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Heptachlor	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Heptachlor epoxide	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Methoxychlor	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Toxaphene	PEST	19.9	UD	19.9	19.8	UD	19.8	20.1	UD	20.1	20	UD	20	19.8	UD	19.8

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-4 - J19YF7			OB-6 - J19YF9			OB-7 - J19YH0			OB-8 - J19YH1			OB-8 re-sample 1, J1FKL6		
		5/13/10			5/13/10			5/13/10			5/13/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.28	U	3.28	3.24	U	3.24	3.34	U	3.34	1720	D	26.8	10	U	10
Acenaphthylene	PAH	3.28	U	3.28	3.24	U	3.24	3.34	U	3.34	26.8	U	26.8	9.3	U	9.3
Anthracene	PAH	3.28	U	3.28	3.24	U	3.24	37.5		3.34	421	D	26.8	3.1	U	3.1
Benzo(a)anthracene	PAH	0.919	J	3.28	4.65		3.24	55.5		3.34	746	D	26.8	18		3.3
Benzo(a)pyrene	PAH	1.44	J	3.28	7.63		3.24	68.8		3.34	729	D	26.8	17		6.6
Benzo(b)fluoranthene	PAH	1.07	J	3.28	9.71		3.24	71.0		3.34	912	D	26.8	18		4.3
Benzo(ghi)perylene	PAH	0.837	J	3.28	9.53		3.24	36.8		3.34	504	D	26.8	7.4	U	7.4
Benzo(k)fluoranthene	PAH	3.28	U	3.28	3.92		3.24	30.4		3.34	410	D	26.8	9.2	J	4.1
Chrysene	PAH	1.46	J	3.28	5.51		3.24	39.9		3.34	408	D	26.8	16	J	5.0
Dibenz[a,h]anthracene	PAH	3.28	U	3.28	1.43	J	3.24	8.73		3.34	138	D	26.8	11	U	11
Fluoranthene	PAH	6.55		3.28	15.3		3.24	161		3.34	2380	D	26.8	13	U	13
Fluorene	PAH	3.28	U	3.28	3.24	U	3.24	4.38		3.34	236	D	26.8	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	1.18	J	3.28	7.89		3.24	42.4		3.34	378	D	26.8	14	J	12
Naphthalene	PAH	3.28	U	3.28	3.24	U	3.24	3.34	U	3.34	284	D	26.8	12	U	12
Phenanthrene	PAH	1.61	J	3.28	4.49		3.24	86.9		3.34	1540	D	26.8	15	J	12
Pyrene	PAH	2.38	J	3.28	9.13		3.24	176		3.34	2470	D	26.8	34	J	12
Aroclor-1016	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.9	U	2.9
Aroclor-1221	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	8.5	U	8.5
Aroclor-1232	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.1	U	2.1
Aroclor-1242	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	4.9	U	4.9
Aroclor-1248	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	4.9	U	4.9
Aroclor-1254	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.7	U	2.7
Aroclor-1260	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.7	U	2.7
Aldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.26	U	0.26
Alpha-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.23	U	0.23
alpha-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.34	U	0.34
Beta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.70	U	0.70
Delta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.42	U	0.42
4,4'-DDD	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.57	U	0.57
4,4'-DDE	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.45	JX	0.25
4,4'-DDT	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.62	U	0.62
Dieldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.22	U	0.22
Endosulfan I	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.19	U	0.19
Endosulfan II	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.30	U	0.30
Endosulfan sulfate	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.29	U	0.29
Endrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.32	U	0.32
Endrin aldehyde	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.18	U	0.18
Endrin ketone	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.51	U	0.51
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.49	U	0.49
gamma-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.28	U	0.28
Heptachlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.23	U	0.23
Heptachlor epoxide	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.45	U	0.45
Methoxychlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.47	U	0.47
Toxaphene	PEST	20	UD	20	20.1	UD	20.1	20	UD	20	20.2	UD	20.2	17	U	17

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-9 - J19YH2 5/13/10			OB-10 - J19YH3 5/13/10			OB-11 - J19YH4 5/13/10			OB-12 - J19YH5 5/13/10			OB-13 - J1B4H9 5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	21.9		3.25	3.32	U	3.32	7.1		3.18	3.36	U	3.36	7.96		3.33
Acenaphthylene	PAH	3.25	U	3.25	3.32	U	3.32	3.18	U	3.18	3.36	U	3.36	3.33	U	3.33
Anthracene	PAH	58.4		3.25	1.88	J	3.32	2.43	J	3.18	1.41	J	3.36	3.33	U	3.33
Benzo(a)anthracene	PAH	94.5		3.25	13.3		3.32	21.3		3.18	13.7		3.36	10.2		3.33
Benzo(a)pyrene	PAH	85.3		3.25	11.9		3.32	57.4		3.18	12.8		3.36	7.41		3.33
Benzo(b)fluoranthene	PAH	84.1		3.25	11.7		3.32	53.5		3.18	17		3.36	15.4		3.33
Benzo(ghi)perylene	PAH	64.5		3.25	9.20		3.32	98.0		3.18	9.28		3.36	4.4		3.33
Benzo(k)fluoranthene	PAH	43.5		3.25	6.08		3.32	22.1		3.18	6.11		3.36	3.4		3.33
Chrysene	PAH	160		3.25	34.1		3.32	17.3		3.18	23.7		3.36	18.7		3.33
Dibenz[a,h]anthracene	PAH	19.0		3.25	2.49	J	3.32	10.8		3.18	1.6	J	3.36	3.33	U	3.33
Fluoranthene	PAH	269		3.25	29.1		3.32	54.6		3.18	29.5		3.36	24.6		3.33
Fluorene	PAH	32.3		3.25	1.36	J	3.32	1.11	J	3.18	3.36	U	3.36	3.33	U	3.33
Indeno(1,2,3-cd)pyrene	PAH	71.3		3.25	12.8		3.32	68.8		3.18	9.37		3.36	8.95		3.33
Naphthalene	PAH	3.25	U	3.25	3.32	U	3.32	3.18	U	3.18	3.36	U	3.36	25.1		3.33
Phenanthrene	PAH	201		3.25	11.3		3.32	14.1		3.18	10.4		3.36	7.35		3.33
Pyrene	PAH	290		3.25	39.6		3.32	51.9		3.18	28.7		3.36	18.3		3.33
Aroclor-1016	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1221	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1232	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1242	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1248	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1254	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1260	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aldrin	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Alpha-BHC	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
alpha-Chlordane	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Beta-BHC	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Delta-BHC	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
4,4'-DDD	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
4,4'-DDE	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
4,4'-DDT	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Dieldrin	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endosulfan I	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endosulfan II	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endosulfan sulfate	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endrin	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endrin aldehyde	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endrin ketone	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
gamma-Chlordane	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Heptachlor	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Heptachlor epoxide	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Methoxychlor	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Toxaphene	PEST	20.1	UD	20.1	19.9	UD	19.9	19.8	UD	19.8	20.1	UD	20.1	20	UD	20

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-14 - J1B4J0			OB-15 - J1B4J1			SPA-4 - J19YJ0			SPA-4 re-sample 1, J1FKM0			Duplicate of J19YJ4 - J19YJ9		
		5/17/10			5/17/10			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.33	U	3.33	3.34	U	3.34	3.34	U	3.34	9.7	U	9.7	39.1		3.35
Acenaphthylene	PAH	3.33	U	3.33	3.34	U	3.34	16.7		3.34	8.7	U	8.7	3.35	U	3.35
Anthracene	PAH	3.33	U	3.33	2.59	J	3.34	3.34	U	3.34	87		3.0	28.4		3.35
Benzo(a)anthracene	PAH	6.98		3.33	22.3		3.34	1.04	J	3.34	230		3.1	128		3.35
Benzo(a)pyrene	PAH	5.72		3.33	18.9		3.34	2.07	J	3.34	170		6.2	142		3.35
Benzo(b)fluoranthene	PAH	8.78		3.33	27.5		3.34	1.81	J	3.34	190		4.1	179		3.35
Benzo(ghi)perylene	PAH	4.07		3.33	11.6		3.34	1.15	J	3.34	96		7.0	90.1		3.35
Benzo(k)fluoranthene	PAH	2.53	J	3.33	7.86		3.34	1	J	3.34	87		3.8	67		3.35
Chrysene	PAH	8.23		3.33	32.5		3.34	3.34	U	3.34	160		4.7	117		3.35
Dibenz[a,h]anthracene	PAH	3.33	U	3.33	1.49	J	3.34	3.34	U	3.34	26	JX	11	19.2		3.35
Fluoranthene	PAH	17.9		3.33	65.9		3.34	6.67		3.34	400		13	333		3.35
Fluorene	PAH	3.33	U	3.33	1.71	J	3.34	3.34	U	3.34	57		5.1	11.9		3.35
Indeno(1,2,3-cd)pyrene	PAH	5.05		3.33	16.5		3.34	1.6	J	3.34	120		12	95.6		3.35
Naphthalene	PAH	3.33	U	3.33	3.34	U	3.34	3.34	U	3.34	12	U	12	3.35	U	3.35
Phenanthrene	PAH	6.48		3.33	26.8		3.34	1.96	J	3.34	240		12	128		3.35
Pyrene	PAH	13.8		3.33	49.6		3.34	1.49	J	3.34	400		12	346		3.35
Aroclor-1016	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.9	U	2.9	13.4	U	13.4
Aroclor-1221	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	8.3	U	8.3	13.4	U	13.4
Aroclor-1232	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.1	U	2.1	13.4	U	13.4
Aroclor-1242	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	4.8	U	4.8	13.4	U	13.4
Aroclor-1248	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	4.8	U	4.8	13.4	U	13.4
Aroclor-1254	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.7	U	2.7	13.4	U	13.4
Aroclor-1260	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.7	U	2.7	5.26	J	13.4
Aldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.25	U	0.25	1.34	UD	1.34
Alpha-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.21	U	0.21	1.34	UD	1.34
alpha-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.32	U	0.32	1.34	UD	1.34
Beta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.66	U	0.66	1.34	UD	1.34
Delta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.40	U	0.40	1.34	UD	1.34
4,4'-DDD	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.54	U	0.54	1.34	UD	1.34
4,4'-DDE	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.24	U	0.24	6.74	D	6.74
4,4'-DDT	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.59	U	0.59	1.34	UD	1.34
Dieldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.21	U	0.21	1.34	UD	1.34
Endosulfan I	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.18	U	0.18	3.02	JD	3.02
Endosulfan II	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.29	U	0.29	1.34	UD	1.34
Endosulfan sulfate	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.28	U	0.28	1.34	UD	1.34
Endrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.30	U	0.30	1.34	UD	1.34
Endrin aldehyde	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.17	U	0.17	1.34	UD	1.34
Endrin ketone	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.49	U	0.49	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.46	U	0.46	1.34	UD	1.34
gamma-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.27	U	0.27	1.34	UD	1.34
Heptachlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.21	U	0.21	1.34	UD	1.34
Heptachlor epoxide	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.42	U	0.42	1.34	UD	1.34
Methoxychlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.45	U	0.45	1.34	UD	1.34
Toxaphene	PEST	20	UD	20	20.1	UD	20.1	20	UD	20	16	U	16	20.1	UD	20.1

Attachment	1	Sheet No.	57 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J1FKM0 re-sample 1, J1FKM9			SPA-1 - J19YH7			SPA-1 re-sample 1, J1FKL7			SPA-2 - J19YH8			SPA-2 re-sample 1, J1FKL8		
		3/17/11			5/17/10			3/17/11			5/17/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.6	U	9.6	6.67	U	6.67	10	U	10	3.33	U	3.33	10	U	10
Acenaphthylene	PAH	8.6	U	8.6	6.67	U	6.67	9.3	U	9.3	34.9		3.33	27	J	9.3
Anthracene	PAH	48		2.9	71.7	D	6.67	3.1	U	3.1	3.33	U	3.33	3.1	U	3.1
Benzo(a)anthracene	PAH	170		3.1	258	D	6.67	3.3	U	3.3	7.26		3.33	3.3	U	3.3
Benzo(a)pyrene	PAH	120		6.2	307	D	6.67	6.6	U	6.6	10.5		3.33	6.8	J	6.6
Benzo(b)fluoranthene	PAH	140		4.0	338	D	6.67	4.3	U	4.3	11.2		3.33	4.3	U	4.3
Benzo(ghi)perylene	PAH	38	X	6.9	186	D	6.67	7.4	U	7.4	12.2		3.33	7.4	U	7.4
Benzo(k)fluoranthene	PAH	69		3.8	145	D	6.67	4.1	U	4.1	6.28		3.33	4.1	U	4.1
Chrysene	PAH	140		4.6	143	D	6.67	5.0	U	5.0	4.05		3.33	5.0	U	5.0
Dibenz[a,h]anthracene	PAH	19	JX	11	39.9	D	6.67	11	U	11	1.5	J	3.33	11	U	11
Fluoranthene	PAH	290		12	731	D	6.67	13	U	13	29.7		3.33	13	U	13
Fluorene	PAH	31		5.1	32.9	D	6.67	5.4	U	5.4	3.33	U	3.33	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	110		12	211	D	6.67	12	U	12	11.6		3.33	12	U	12
Naphthalene	PAH	12	U	12	6.67	U	6.67	12	U	12	3.33	U	3.33	12	U	12
Phenanthrene	PAH	130		12	247	D	6.67	12	U	12	10.6		3.33	12	U	12
Pyrene	PAH	300		12	790	D	6.67	12	U	12	22		3.33	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	13.4	U	13.4	2.8	U	2.8	13.3	U	13.3	2.6	U	2.6
Aroclor-1221	PCB	8.0	U	8.0	13.4	U	13.4	8.1	U	8.1	13.3	U	13.3	7.6	U	7.6
Aroclor-1232	PCB	2.0	U	2.0	13.4	U	13.4	2.0	U	2.0	13.3	U	13.3	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.3	U	13.3	4.4	U	4.4
Aroclor-1248	PCB	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.3	U	13.3	4.4	U	4.4
Aroclor-1254	PCB	2.6	U	2.6	13.4	U	13.4	2.6	U	2.6	13.3	U	13.3	2.5	U	2.5
Aroclor-1260	PCB	2.6	U	2.6	13.4	U	13.4	2.6	U	2.6	13.3	U	13.3	2.5	U	2.5
Aldrin	PEST	0.26	U	0.26	1.34	UD	1.34	0.25	U	0.25	1.33	UD	1.33	0.26	U	0.26
Alpha-BHC	PEST	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.33	UD	1.33	0.22	U	0.22
alpha-Chlordane	PEST	0.33	U	0.33	1.34	UD	1.34	0.33	U	0.33	1.33	UD	1.33	0.33	U	0.33
Beta-BHC	PEST	0.69	U	0.69	1.34	UD	1.34	0.67	U	0.67	1.33	UD	1.33	0.68	U	0.68
Delta-BHC	PEST	0.41	U	0.41	1.34	UD	1.34	0.40	U	0.40	1.33	UD	1.33	0.41	U	0.41
4,4'-DDD	PEST	0.56	U	0.56	1.34	UD	1.34	0.55	U	0.55	1.33	UD	1.33	0.56	U	0.56
4,4'-DDE	PEST	0.25	U	0.25	1.51	JD	1.51	0.24	U	0.24	1.33	UD	1.33	0.24	U	0.24
4,4'-DDT	PEST	0.61	U	0.61	1.34	UD	1.34	0.59	U	0.59	1.33	UD	1.33	0.60	U	0.60
Dieldrin	PEST	0.22	U	0.22	1.34	UD	1.34	0.21	U	0.21	1.33	UD	1.33	0.21	U	0.21
Endosulfan I	PEST	0.18	U	0.18	1.34	UD	1.34	0.18	U	0.18	1.33	UD	1.33	0.18	U	0.18
Endosulfan II	PEST	0.30	U	0.30	1.34	UD	1.34	0.29	U	0.29	1.33	UD	1.33	0.29	U	0.29
Endosulfan sulfate	PEST	0.29	U	0.29	1.34	UD	1.34	0.28	U	0.28	1.33	UD	1.33	0.28	U	0.28
Endrin	PEST	0.32	U	0.32	1.34	UD	1.34	0.31	U	0.31	1.33	UD	1.33	0.31	U	0.31
Endrin aldehyde	PEST	0.18	U	0.18	1.34	UD	1.34	0.17	U	0.17	1.33	UD	1.33	0.17	U	0.17
Endrin ketone	PEST	0.51	U	0.51	1.34	UD	1.34	0.49	U	0.49	1.33	UD	1.33	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.48	U	0.48	1.34	UD	1.34	0.47	U	0.47	1.33	UD	1.33	0.47	U	0.47
gamma-Chlordane	PEST	0.27	U	0.27	1.34	UD	1.34	0.27	U	0.27	1.33	UD	1.33	0.27	U	0.27
Heptachlor	PEST	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.33	UD	1.33	0.22	U	0.22
Heptachlor epoxide	PEST	0.44	U	0.44	1.34	UD	1.34	0.43	U	0.43	1.33	UD	1.33	0.43	U	0.43
Methoxychlor	PEST	0.46	U	0.46	1.34	UD	1.34	0.45	U	0.45	1.33	UD	1.33	0.46	U	0.46
Toxaphene	PEST	16	U	16	20.1	UD	20.1	16	U	16	19.9	UD	19.9	16	U	16

Attachment	1	Sheet No.	58 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-3 - J19YH9			SPA-3 re-sample 1, J1FKL9			SPA-5 - J19YJ1			SPA-5 re-sample 1, J1FKM1			SPA-6 - J19YJ2		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.29	U	3.29	9.7	U	9.7	6.77		3.3	9.7	U	9.7	13.2	U	13.2
Acenaphthylene	PAH	3.29	U	3.29	8.8	U	8.8	85.1		3.3	8.7	U	8.7	53.3	D	13.2
Anthracene	PAH	1.7	J	3.29	3.5	J	3.0	3.3	U	3.3	3.0	U	3.0	62.3	D	13.2
Benzo(a)anthracene	PAH	4.56		3.29	25	X	3.1	14.5		3.3	19		3.1	334	D	13.2
Benzo(a)pyrene	PAH	5.52		3.29	17		6.2	10.4		3.3	22		6.2	380	D	13.2
Benzo(b)fluoranthene	PAH	4.51		3.29	20		4.1	7.95		3.3	25		4.1	366	D	13.2
Benzo(ghi)perylene	PAH	4.04		3.29	7.0	U	7.0	30.9		3.3	7.0	U	7.0	242	D	13.2
Benzo(k)fluoranthene	PAH	2.42	J	3.29	11	JX	3.8	4.23		3.3	9.8	J	3.8	183	D	13.2
Chrysene	PAH	4.91		3.29	27	J	4.7	17.8		3.3	21	J	4.7	339	D	13.2
Dibenz[a,h]anthracene	PAH	3.29	U	3.29	11	U	11	9.3		3.3	11	U	11	49.8	D	13.2
Fluoranthene	PAH	17.7		3.29	45		13	33.5		3.3	17	JX	13	905	D	13.2
Fluorene	PAH	3.29	U	3.29	5.1	U	5.1	3.3	U	3.3	5.1	U	5.1	32.2	D	13.2
Indeno(1,2,3-cd)pyrene	PAH	3.99		3.29	12	J	12	11.2		3.3	16	J	12	252	D	13.2
Naphthalene	PAH	3.29	U	3.29	12	U	12	3.3	U	3.3	12	U	12	13.2	U	13.2
Phenanthrene	PAH	5.73		3.29	13	J	12	12.1		3.3	12	U	12	326	D	13.2
Pyrene	PAH	10.6		3.29	54		12	24.2		3.3	30	J	12	956	D	13.2
Aroclor-1016	PCB	13.4	U	13.4	2.8	U	2.8	13.4	U	13.4	2.8	U	2.8	13.4	U	13.4
Aroclor-1221	PCB	13.4	U	13.4	8.2	U	8.2	13.4	U	13.4	8.1	U	8.1	13.4	U	13.4
Aroclor-1232	PCB	13.4	U	13.4	2.0	U	2.0	13.4	U	13.4	2.0	U	2.0	13.4	U	13.4
Aroclor-1242	PCB	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4
Aroclor-1248	PCB	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4
Aroclor-1254	PCB	13.4	U	13.4	2.6	U	2.6	13.4	U	13.4	15		2.6	20.8		13.4
Aroclor-1260	PCB	13.4	U	13.4	2.6	U	2.6	13.4	U	13.4	10		2.6	24.8		13.4
Aldrin	PEST	1.34	UD	1.34	0.26	U	0.26	1.34	UD	1.34	0.26	U	0.26	1.34	UD	1.34
Alpha-BHC	PEST	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34
alpha-Chlordane	PEST	1.34	UD	1.34	0.33	U	0.33	1.34	UD	1.34	0.33	U	0.33	1.34	UD	1.34
Beta-BHC	PEST	1.34	UD	1.34	0.69	U	0.69	1.34	UD	1.34	0.69	U	0.69	1.34	UD	1.34
Delta-BHC	PEST	1.34	UD	1.34	0.42	U	0.42	1.34	UD	1.34	0.41	U	0.41	1.34	UD	1.34
4,4'-DDD	PEST	1.34	UD	1.34	0.57	U	0.57	1.34	UD	1.34	0.56	U	0.56	1.34	UD	1.34
4,4'-DDE	PEST	1.34	UD	1.34	0.25	U	0.25	1.34	UD	1.34	14		0.25	268	D	268
4,4'-DDT	PEST	1.34	UD	1.34	0.61	U	0.61	1.34	UD	1.34	5.3		0.61	17.5	D	17.5
Dieldrin	PEST	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34
Endosulfan I	PEST	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34
Endosulfan II	PEST	1.34	UD	1.34	0.30	U	0.30	1.34	UD	1.34	0.30	U	0.30	1.34	UD	1.34
Endosulfan sulfate	PEST	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34
Endrin	PEST	1.34	UD	1.34	0.32	U	0.32	1.34	UD	1.34	0.32	U	0.32	1.34	UD	1.34
Endrin aldehyde	PEST	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34
Endrin ketone	PEST	1.34	UD	1.34	0.51	U	0.51	1.34	UD	1.34	0.51	U	0.51	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	0.48	U	0.48	1.34	UD	1.34	0.48	U	0.48	1.34	UD	1.34
gamma-Chlordane	PEST	1.34	UD	1.34	0.28	U	0.28	1.34	UD	1.34	0.27	U	0.27	1.34	UD	1.34
Heptachlor	PEST	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34
Heptachlor epoxide	PEST	1.34	UD	1.34	0.44	U	0.44	1.34	UD	1.34	0.44	U	0.44	1.34	UD	1.34
Methoxychlor	PEST	1.34	UD	1.34	0.47	U	0.47	1.34	UD	1.34	0.47	U	0.47	1.34	UD	1.34
Toxaphene	PEST	20.1	UD	20.1	16	U	16	20.1	UD	20.1	16	U	16	20.1	UD	20.1

Attachment	1	Sheet No.	59 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-9 - J19YJ5			SPA-9 re-sample 1, J1FKM5			SPA-10 - J19YJ6			SPA-10 re-sample 1, J1FKM6			SPA-11 - J19YJ7		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.34	U	3.34	11	U	11	3.34	U	3.34	9.8	U	9.8	3.29	U	3.29
Acenaphthylene	PAH	3.34	U	3.34	9.7	U	9.7	3.34	U	3.34	8.8	U	8.8	13		3.29
Anthracene	PAH	4.66		3.34	3.3	U	3.3	4.65		3.34	3.0	U	3.0	6.44		3.29
Benzo(a)anthracene	PAH	61.2		3.34	8.9	J	3.5	68.6		3.34	3.1	U	3.1	57.5		3.29
Benzo(a)pyrene	PAH	64.5		3.34	9.6	J	6.9	75.1		3.34	6.3	U	6.3	72.4		3.29
Benzo(b)fluoranthene	PAH	81.8		3.34	4.5	U	4.5	98.4		3.34	4.1	U	4.1	91.8		3.29
Benzo(ghi)perylene	PAH	46.2		3.34	7.8	U	7.8	54.7		3.34	7.0	U	7.0	50.6		3.29
Benzo(k)fluoranthene	PAH	30		3.34	4.3	U	4.3	37.2		3.34	3.8	U	3.8	32.9		3.29
Chrysene	PAH	101		3.34	8.7	J	5.2	107		3.34	4.7	U	4.7	67.6		3.29
Dibenz[a,h]anthracene	PAH	8.71		3.34	12	U	12	10.6		3.34	11	U	11	8.93		3.29
Fluoranthene	PAH	149		3.34	14	U	14	220		3.34	13	U	13	171		3.29
Fluorene	PAH	2.89	J	3.34	5.7	U	5.7	7.59		3.34	5.2	U	5.2	3.05	J	3.29
Indeno(1,2,3-cd)pyrene	PAH	46.8		3.34	13	U	13	54.5		3.34	12	U	12	52.7		3.29
Naphthalene	PAH	16.4		3.34	13	U	13	7.54		3.34	12	U	12	13.7		3.29
Phenanthrene	PAH	41.7		3.34	13	U	13	65.9		3.34	12	U	12	51.1		3.29
Pyrene	PAH	148		3.34	21	J	13	185		3.34	12	U	12	158		3.29
Aroclor-1016	PCB	13.4	U	13.4	2.9	U	2.9	13.3	U	13.3	2.6	U	2.6	13.4	U	13.4
Aroclor-1221	PCB	13.4	U	13.4	8.5	U	8.5	13.3	U	13.3	7.6	U	7.6	13.4	U	13.4
Aroclor-1232	PCB	13.4	U	13.4	2.1	U	2.1	13.3	U	13.3	1.9	U	1.9	13.4	U	13.4
Aroclor-1242	PCB	13.4	U	13.4	5.0	U	5.0	13.3	U	13.3	4.4	U	4.4	13.4	U	13.4
Aroclor-1248	PCB	13.4	U	13.4	5.0	U	5.0	13.3	U	13.3	4.4	U	4.4	13.4	U	13.4
Aroclor-1254	PCB	13	J	13.4	2.8	U	2.8	16.4		13.3	2.5	U	2.5	13.4	U	13.4
Aroclor-1260	PCB	11.7	J	13.4	2.8	U	2.8	16.8		13.3	2.5	U	2.5	5.37	J	13.4
Aldrin	PEST	1.34	UD	1.34	0.28	U	0.28	1.34	UD	1.34	0.25	U	0.25	1.34	UD	1.34
Alpha-BHC	PEST	1.34	UD	1.34	0.23	U	0.23	1.34	UD	1.34	0.21	U	0.21	1.34	UD	1.34
alpha-Chlordane	PEST	1.34	UD	1.34	0.35	U	0.35	1.34	UD	1.34	0.32	U	0.32	1.34	UD	1.34
Beta-BHC	PEST	1.34	UD	1.34	0.73	U	0.73	1.34	UD	1.34	0.67	U	0.67	1.34	UD	1.34
Delta-BHC	PEST	1.34	UD	1.34	0.44	U	0.44	1.34	UD	1.34	0.40	U	0.40	1.34	UD	1.34
4,4'-DDD	PEST	1.34	UD	1.34	0.60	U	0.60	1.34	UD	1.34	0.55	U	0.55	1.34	UD	1.34
4,4'-DDE	PEST	24.7	D	24.7	0.26	U	0.26	10.3	D	10.3	0.24	U	0.24	4.87	JD	4.87
4,4'-DDT	PEST	2.54	JD	2.54	0.65	U	0.65	1.84	JD	1.84	0.59	U	0.59	1.34	UD	1.34
Dieldrin	PEST	1.34	UD	1.34	0.23	U	0.23	1.34	UD	1.34	0.21	U	0.21	1.34	UD	1.34
Endosulfan I	PEST	1.34	UD	1.34	0.19	U	0.19	4.68	JD	4.68	0.18	U	0.18	1.34	UD	1.34
Endosulfan II	PEST	1.34	UD	1.34	0.31	U	0.31	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34
Endosulfan sulfate	PEST	1.34	UD	1.34	0.30	U	0.30	1.34	UD	1.34	0.28	U	0.28	1.34	UD	1.34
Endrin	PEST	1.34	UD	1.34	0.34	U	0.34	1.34	UD	1.34	0.31	U	0.31	1.34	UD	1.34
Endrin aldehyde	PEST	1.34	UD	1.34	0.19	U	0.19	1.34	UD	1.34	0.17	U	0.17	1.34	UD	1.34
Endrin ketone	PEST	1.34	UD	1.34	0.54	U	0.54	1.34	UD	1.34	0.49	U	0.49	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	0.51	U	0.51	1.34	UD	1.34	0.46	U	0.46	1.34	UD	1.34
gamma-Chlordane	PEST	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34	0.27	U	0.27	1.34	UD	1.34
Heptachlor	PEST	1.34	UD	1.34	0.23	U	0.23	1.34	UD	1.34	0.21	U	0.21	1.34	UD	1.34
Heptachlor epoxide	PEST	1.34	UD	1.34	0.47	U	0.47	1.34	UD	1.34	0.43	U	0.43	1.34	UD	1.34
Methoxychlor	PEST	1.34	UD	1.34	0.49	U	0.49	1.34	UD	1.34	0.45	U	0.45	1.34	UD	1.34
Toxaphene	PEST	20.1	UD	20.1	17	U	17	20.1	UD	20.1	16	U	16	20.1	UD	20.1

Attachment	1	Sheet No.	61 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-11 re-sample 1, J1FKM7			SPA-12 - J19YJ8			SPA-12 re-sample 1, J1FKM8		
		3/17/11			5/17/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	3.34	U	3.34	10	U	10
Acenaphthylene	PAH	9.1	U	9.1	3.34	U	3.34	9.3	U	9.3
Anthracene	PAH	3.1	U	3.1	4.89		3.34	3.2	U	3.2
Benzo(a)anthracene	PAH	3.2	U	3.2	47.8		3.34	44		3.3
Benzo(a)pyrene	PAH	6.5	U	6.5	52.4		3.34	27		6.6
Benzo(b)fluoranthene	PAH	4.3	U	4.3	67.8		3.34	37		4.3
Benzo(ghi)perylene	PAH	7.3	U	7.3	61.3		3.34	7.5	U	7.5
Benzo(k)fluoranthene	PAH	4.0	U	4.0	25.1		3.34	14	J	4.1
Chrysene	PAH	4.9	U	4.9	70.2		3.34	35	J	5.0
Dibenz[a,h]anthracene	PAH	11	U	11	8.69		3.34	11	U	11
Fluoranthene	PAH	13	U	13	139		3.34	13	U	13
Fluorene	PAH	5.4	U	5.4	2.49	J	3.34	5.5	U	5.5
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	56.8		3.34	27	J	12
Naphthalene	PAH	12	U	12	3.34	U	3.34	12	U	12
Phenanthrene	PAH	12	U	12	52		3.34	14	J	12
Pyrene	PAH	12	U	12	123		3.34	65		12
Aroclor-1016	PCB	2.8	U	2.8	13.2	U	13.2	2.8	U	2.8
Aroclor-1221	PCB	8.0	U	8.0	13.2	U	13.2	8.2	U	8.2
Aroclor-1232	PCB	2.0	U	2.0	13.2	U	13.2	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	13.2	U	13.2	4.7	U	4.7
Aroclor-1248	PCB	4.7	U	4.7	13.2	U	13.2	4.7	U	4.7
Aroclor-1254	PCB	2.6	U	2.6	13.2	U	13.2	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	13.2	U	13.2	2.6	U	2.6
Aldrin	PEST	0.25	U	0.25	1.32	UD	1.32	0.26	U	0.26
Alpha-BHC	PEST	0.21	U	0.21	1.32	UD	1.32	0.22	U	0.22
alpha-Chlordane	PEST	0.32	U	0.32	1.32	UD	1.32	0.34	U	0.34
Beta-BHC	PEST	0.66	U	0.66	1.32	UD	1.32	0.69	U	0.69
Delta-BHC	PEST	0.40	U	0.40	1.32	UD	1.32	0.42	U	0.42
4,4'-DDD	PEST	0.54	U	0.54	1.32	UD	1.32	0.57	U	0.57
4,4'-DDE	PEST	0.24	U	0.24	2.08	JD	2.08	0.33	JX	0.25
4,4'-DDT	PEST	0.58	U	0.58	1.32	UD	1.32	0.61	U	0.61
Dieldrin	PEST	0.21	U	0.21	1.32	UD	1.32	0.22	U	0.22
Endosulfan I	PEST	0.17	U	0.17	1.32	UD	1.32	0.18	U	0.18
Endosulfan II	PEST	0.28	U	0.28	1.32	UD	1.32	0.30	U	0.30
Endosulfan sulfate	PEST	0.27	U	0.27	1.32	UD	1.32	0.29	U	0.29
Endrin	PEST	0.30	U	0.30	1.32	UD	1.32	0.32	U	0.32
Endrin aldehyde	PEST	0.17	U	0.17	1.32	UD	1.32	0.18	U	0.18
Endrin ketone	PEST	0.48	U	0.48	1.32	UD	1.32	0.51	U	0.51
Gamma-BHC (Lindane)	PEST	0.46	U	0.46	1.32	UD	1.32	0.48	U	0.48
gamma-Chlordane	PEST	0.26	U	0.26	1.32	UD	1.32	0.28	U	0.28
Heptachlor	PEST	0.21	U	0.21	1.32	UD	1.32	0.22	U	0.22
Heptachlor epoxide	PEST	0.42	U	0.42	1.32	UD	1.32	0.44	U	0.44
Methoxychlor	PEST	0.45	U	0.45	1.32	UD	1.32	0.47	U	0.47
Toxaphene	PEST	16	U	16	19.8	UD	19.8	16	U	16

Attachment	1	Sheet No.	62 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-5 - J19YF8			Duplicate of J19YF8 - J19YH6			OB-1 - J19YF4			OB-2 - J19YF5			OB-3 - J19YF6		
		5/13/10			5/13/10			5/13/10			5/13/10			5/13/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
1,2-Dichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
1,3-Dichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
1,4-Dichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4,5-Trichlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4,6-Trichlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4-Dichlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4-Dimethylphenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4-Dinitrophenol	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
2,4-Dinitrotoluene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,6-Dinitrotoluene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Chloronaphthalene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Chlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Methylnaphthalene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Methylphenol (cresol, o-)	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Nitroaniline	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
2-Nitrophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
3,3'-Dichlorobenzidine	SVOA	663	U	663	660	U	660	667	U	667	649	U	649	659	U	659
3+4 Methylphenol (cresol, m+p)	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
3-Nitroaniline	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Bromophenylphenyl ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Chloro-3-methylphenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Chloroaniline	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Chlorophenylphenyl ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Nitroaniline	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
4-Nitrophenol	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
Acenaphthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Acenaphthylene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Anthracene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(a)anthracene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(a)pyrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(b)fluoranthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(ghi)perylene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(k)fluoranthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-chloro-1-methylethyl)ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-Chloroethoxy)methane	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-chloroethyl) ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-ethylhexyl) phthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Butylbenzylphthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Carbazole	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Chrysene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Dibenz[a,h]anthracene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Dibenzofuran	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Diethyl phthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Dimethyl phthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Di-n-butylphthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Di-n-octylphthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Fluoranthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Fluorene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachlorobutadiene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachlorocyclopentadiene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachloroethane	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Indeno(1,2,3-cd)pyrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Isophorone	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Naphthalene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Nitrobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
N-Nitroso-di-n-dipropylamine	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
N-Nitrosodiphenylamine	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Pentachlorophenol	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
Phenanthrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Phenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Pyrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-4 - J19YF7			OB-6 - J19YF9			OB-7 - J19YH0			OB-8 - J19YH1			OB-8 re-sample 1, J1FKL6		
		5/13/10			5/13/10			5/13/10			5/13/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	29	U	29
1,2-Dichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	23	U	23
1,3-Dichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	13	U	13
1,4-Dichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	14	U	14
2,4,5-Trichlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2,4,6-Trichlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2,4-Dichlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2,4-Dimethylphenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	69	U	69
2,4-Dinitrophenol	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	350	U	350
2,4-Dinitrotoluene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	69	U	69
2,6-Dinitrotoluene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	29	U	29
2-Chloronaphthalene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2-Chlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
2-Methylnaphthalene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	20	U	20
2-Methylphenol (cresol, o-)	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	14	U	14
2-Nitroaniline	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	52	U	52
2-Nitrophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
3,3'-Dichlorobenzidine	SVOA	662	U	662	658	U	658	647	U	647	660	U	660	94	U	94
3+4 Methylphenol (cresol, m+p)	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	34	U	34
3-Nitroaniline	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	76	U	76
4,6-Dinitro-2-methylphenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	340	U	340
4-Bromophenylphenyl ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	20	U	20
4-Chloro-3-methylphenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	69	U	69
4-Chloroaniline	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	85	U	85
4-Chlorophenylphenyl ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
4-Nitroaniline	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	76	U	76
4-Nitrophenol	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	100	U	100
Acenaphthene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	11	U	11
Acenaphthylene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	18	U	18
Anthracene	SVOA	331	U	331	329	U	329	323	U	323	191	J	330	18	U	18
Benzo(a)anthracene	SVOA	331	U	331	329	U	329	323	U	323	636		330	21	U	21
Benzo(a)pyrene	SVOA	331	U	331	329	U	329	323	U	323	558		330	71	J	21
Benzo(b)fluoranthene	SVOA	331	U	331	329	U	329	323	U	323	485		330	30	JX	27
Benzo(ghi)perylene	SVOA	331	U	331	329	U	329	323	U	323	411		330	17	U	17
Benzo(k)fluoranthene	SVOA	331	U	331	329	U	329	323	U	323	516		330	42	UX	42
Bis(2-chloro-1-methylethyl)ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	24	U	24
Bis(2-chloroethyl) ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	120	JB	48
Butylbenzylphthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	45	U	45
Carbazole	SVOA	331	U	331	329	U	329	323	U	323	95.9	J	330	38	U	38
Chrysene	SVOA	331	U	331	329	U	329	323	U	323	611		330	28	U	28
Dibenz[a,h]anthracene	SVOA	331	U	331	329	U	329	323	U	323	138	J	330	20	U	20
Dibenzofuran	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	21	U	21
Diethyl phthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	27	U	27
Dimethyl phthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	24	U	24
Di-n-butylphthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	30	U	30
Di-n-octylphthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	15	U	15
Fluoranthene	SVOA	331	U	331	329	U	329	323	U	323	1170		330	38	U	38
Fluorene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	19	U	19
Hexachlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	30	U	30
Hexachlorobutadiene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
Hexachlorocyclopentadiene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	52	U	52
Hexachloroethane	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	331	U	331	329	U	329	323	U	323	376		330	65	J	23
Isophorone	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	18	U	18
Naphthalene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	32	U	32
Nitrobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	32	U	32
N-Nitrosodiphenylamine	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
Pentachlorophenol	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	340	U	340
Phenanthrene	SVOA	331	U	331	329	U	329	323	U	323	579		330	18	U	18
Phenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	19	U	19
Pyrene	SVOA	331	U	331	329	U	329	323	U	323	933		330	25	J	13

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-9 - J19YH2			OB-10 - J19YH3			OB-11 - J19YH4			OB-12 - J19YH5			OB-13 - J1B4H9		
		5/13/10			5/13/10			5/13/10			5/13/10			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
1,2-Dichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
1,3-Dichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
1,4-Dichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4,5-Trichlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4,6-Trichlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4-Dichlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4-Dimethylphenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4-Dinitrophenol	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
2,4-Dinitrotoluene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,6-Dinitrotoluene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Chloronaphthalene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Chlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Methylnaphthalene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Methylphenol (cresol, o-)	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Nitroaniline	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
2-Nitrophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
3,3'-Dichlorobenzidine	SVOA	663	U	663	663	U	663	665	U	665	657	U	657	662	U	662
3+4 Methylphenol (cresol, m+p)	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
3-Nitroaniline	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
4,6-Dinitro-2-methylphenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Bromophenylphenyl ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Chloro-3-methylphenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Chloroaniline	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Chlorophenylphenyl ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Nitroaniline	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
4-Nitrophenol	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
Acenaphthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Acenaphthylene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Anthracene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Benzo(a)anthracene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Benzo(a)pyrene	SVOA	331	U	331	331	U	331	57.4	J	333	328	U	328	331	U	331
Benzo(b)fluoranthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Benzo(ghi)perylene	SVOA	331	U	331	331	U	331	102	J	102	328	U	328	331	U	331
Benzo(k)fluoranthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-chloro-1-methylethyl)ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-Chloroethoxy)methane	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-chloroethyl) ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-ethylhexyl) phthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Butylbenzylphthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Carbazole	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Chrysene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Dibenz[a,h]anthracene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Dibenzofuran	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Diethyl phthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Dimethyl phthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Di-n-butylphthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Di-n-octylphthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Fluoranthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Fluorene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachlorobutadiene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachlorocyclopentadiene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachloroethane	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Indeno(1,2,3-cd)pyrene	SVOA	331	U	331	331	U	331	56	J	333	328	U	328	331	U	331
Isophorone	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Naphthalene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Nitrobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
N-Nitroso-di-n-dipropylamine	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
N-Nitrosodiphenylamine	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Pentachlorophenol	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
Phenanthrene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Phenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Pyrene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-14 - J1B4J0			OB-15 - J1B4J1			SPA-4 - J19YJ0			SPA-4 re-sample 1, J1FKM0			Duplicate of J19YJ4 - J19YJ9		
		5/17/10			5/17/10			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	28	U	28	658	UD	658
1,2-Dichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	22	U	22	658	UD	658
1,3-Dichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	12	U	12	658	UD	658
1,4-Dichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	14	U	14	658	UD	658
2,4,5-Trichlorophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2,4,6-Trichlorophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2,4-Dichlorophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2,4-Dimethylphenol	SVOA	328	U	328	331	U	331	325	U	325	66	U	66	658	UD	658
2,4-Dinitrophenol	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	330	U	330	3290	UD	3290
2,4-Dinitrotoluene	SVOA	328	U	328	331	U	331	325	U	325	66	U	66	658	UD	658
2,6-Dinitrotoluene	SVOA	328	U	328	331	U	331	325	U	325	28	U	28	658	UD	658
2-Chloronaphthalene	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2-Chlorophenol	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
2-Methylnaphthalene	SVOA	328	U	328	331	U	331	325	U	325	19	U	19	658	UD	658
2-Methylphenol (cresol, o-)	SVOA	328	U	328	331	U	331	325	U	325	13	U	13	658	UD	658
2-Nitroaniline	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	50	U	50	3290	UD	3290
2-Nitrophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
3,3'-Dichlorobenzidine	SVOA	657	U	657	663	U	663	650	U	650	90	U	90	1320	UD	1320
3+4 Methylphenol (cresol, m+p)	SVOA	328	U	328	331	U	331	325	U	325	33	U	33	658	UD	658
3-Nitroaniline	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	73	U	73	3290	UD	3290
4,6-Dinitro-2-methylphenol	SVOA	328	U	328	331	U	331	325	U	325	330	U	330	658	UD	658
4-Bromophenylphenyl ether	SVOA	328	U	328	331	U	331	325	U	325	19	U	19	658	UD	658
4-Chloro-3-methylphenol	SVOA	328	U	328	331	U	331	325	U	325	66	U	66	658	UD	658
4-Chloroaniline	SVOA	328	U	328	331	U	331	325	U	325	82	U	82	658	UD	658
4-Chlorophenylphenyl ether	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
4-Nitroaniline	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	72	U	72	3290	UD	3290
4-Nitrophenol	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	97	U	97	3290	UD	3290
Acenaphthene	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	231	JD	658
Acenaphthylene	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	658	UD	658
Anthracene	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	501	JD	658
Benzo(a)anthracene	SVOA	328	U	328	331	U	331	325	U	325	71	J	20	1450	D	658
Benzo(a)pyrene	SVOA	328	U	328	331	U	331	325	U	325	110	J	20	1310	D	658
Benzo(b)fluoranthene	SVOA	328	U	328	331	U	331	325	U	325	120	JX	26	1190	D	658
Benzo(ghi)perylene	SVOA	328	U	328	331	U	331	325	U	325	41	J	16	906	D	658
Benzo(k)fluoranthene	SVOA	328	U	328	331	U	331	325	U	325	40	UX	40	1240	D	658
Bis(2-chloro-1-methylethyl)ether	SVOA	328	U	328	331	U	331	325	U	325	23	U	23	658	UD	658
Bis(2-Chloroethoxy)methane	SVOA	328	U	328	331	U	331	325	U	325	23	U	23	658	UD	658
Bis(2-chloroethyl) ether	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	658	UD	658
Bis(2-ethylhexyl) phthalate	SVOA	328	U	328	331	U	331	325	U	325	110	JB	46	658	UD	658
Butylbenzylphthalate	SVOA	328	U	328	331	U	331	325	U	325	43	U	43	658	UD	658
Carbazole	SVOA	328	U	328	331	U	331	325	U	325	36	U	36	267	JD	658
Chrysene	SVOA	328	U	328	331	U	331	325	U	325	66	J	27	1440	D	658
Dibenz[a,h]anthracene	SVOA	328	U	328	331	U	331	325	U	325	19	U	19	313	JD	658
Dibenzofuran	SVOA	328	U	328	331	U	331	325	U	325	20	U	20	112	JD	658
Diethyl phthalate	SVOA	328	U	328	331	U	331	325	U	325	26	U	26	658	UD	658
Dimethyl phthalate	SVOA	328	U	328	331	U	331	325	U	325	23	U	23	658	UD	658
Di-n-butylphthalate	SVOA	328	U	328	331	U	331	325	U	325	29	U	29	658	UD	658
Di-n-octylphthalate	SVOA	328	U	328	331	U	331	325	U	325	14	U	14	658	UD	658
Fluoranthene	SVOA	328	U	328	331	U	331	325	U	325	120	J	36	3120	D	658
Fluorene	SVOA	328	U	328	331	U	331	325	U	325	18	U	18	177	JD	658
Hexachlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	29	U	29	658	UD	658
Hexachlorobutadiene	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
Hexachlorocyclopentadiene	SVOA	328	U	328	331	U	331	325	U	325	50	U	50	658	UD	658
Hexachloroethane	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
Indeno(1,2,3-cd)pyrene	SVOA	328	U	328	331	U	331	325	U	325	83	J	22	805	D	658
Isophorone	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	658	UD	658
Naphthalene	SVOA	328	U	328	331	U	331	325	U	325	31	U	31	658	UD	658
Nitrobenzene	SVOA	328	U	328	331	U	331	325	U	325	22	U	22	658	UD	658
N-Nitroso-di-n-dipropylamine	SVOA	328	U	328	331	U	331	325	U	325	31	U	31	658	UD	658
N-Nitrosodiphenylamine	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
Pentachlorophenol	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	330	U	330	3290	UD	3290
Phenanthrene	SVOA	328	U	328	331	U	331	325	U	325	44	J	17	2110	D	658
Phenol	SVOA	328	U	328	331	U	331	325	U	325	18	U	18	658	UD	658
Pyrene	SVOA	328	U	328	331	U	331	325	U	325	110	J	12	2190	D	658

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J1FKM0 re-sample 1, J1FKM9 3/17/11			SPA-1 - J19YH7 5/17/10			SPA-1 re-sample 1, J1FKL7 3/17/11			SPA-2 - J19YH8 5/17/10			SPA-2 re-sample 1, J1FKL8 3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	327	U	327	28	U	28	331	U	331	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22	327	U	327	22	U	22	331	U	331	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	327	U	327	12	U	12	331	U	331	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	327	U	327	14	U	14	331	U	331	13	U	13
2,4,5-Trichlorophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2,4,6-Trichlorophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2,4-Dichlorophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2,4-Dimethylphenol	SVOA	67	U	67	327	U	327	66	U	66	331	U	331	63	U	63
2,4-Dinitrophenol	SVOA	340	U	340	1640	U	1640	330	U	330	1650	U	1650	320	U	320
2,4-Dinitrotoluene	SVOA	67	U	67	327	U	327	66	U	66	331	U	331	63	U	63
2,6-Dinitrotoluene	SVOA	28	U	28	327	U	327	28	U	28	331	U	331	27	U	27
2-Chloronaphthalene	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2-Chlorophenol	SVOA	21	U	21	327	U	327	21	U	21	331	U	331	20	U	20
2-Methylnaphthalene	SVOA	19	U	19	327	U	327	19	U	19	331	U	331	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	327	U	327	13	U	13	331	U	331	12	U	12
2-Nitroaniline	SVOA	50	U	50	1640	U	1640	50	U	50	1650	U	1650	48	U	48
2-Nitrophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
3,3'-Dichlorobenzidine	SVOA	91	U	91	655	U	655	90	U	90	662	U	662	87	U	87
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	327	U	327	33	U	33	331	U	331	32	U	32
3-Nitroaniline	SVOA	74	U	74	1640	U	1640	73	U	73	1650	U	1650	70	U	70
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	327	U	327	330	U	330	331	U	331	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19	327	U	327	19	U	19	331	U	331	18	U	18
4-Chloro-3-methylphenol	SVOA	67	U	67	327	U	327	66	U	66	331	U	331	63	U	63
4-Chloroaniline	SVOA	83	U	83	327	U	327	82	U	82	331	U	331	79	U	79
4-Chlorophenylphenyl ether	SVOA	21	U	21	327	U	327	21	U	21	331	U	331	20	U	20
4-Nitroaniline	SVOA	73	U	73	1640	U	1640	73	U	73	1650	U	1650	70	U	70
4-Nitrophenol	SVOA	98	U	98	1640	U	1640	97	U	97	1650	U	1650	93	U	93
Acenaphthene	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.9	U	9.9
Acenaphthylene	SVOA	17	U	17	327	U	327	17	U	17	331	U	331	16	U	16
Anthracene	SVOA	19	J	17	89.6	J	327	17	U	17	331	U	331	16	U	16
Benzo(a)anthracene	SVOA	130	J	20	435		327	20	U	20	331	U	331	19	U	19
Benzo(a)pyrene	SVOA	150	J	20	400		327	20	U	20	331	U	331	19	U	19
Benzo(b)fluoranthene	SVOA	210	JX	26	369		327	26	U	26	331	U	331	25	U	25
Benzo(ghi)perylene	SVOA	68	J	16	237	J	327	16	U	16	331	U	331	15	U	15
Benzo(k)fluoranthene	SVOA	40	UX	40	382		327	40	U	40	331	U	331	38	U	38
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	327	U	327	23	U	23	331	U	331	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	327	U	327	23	U	23	331	U	331	22	U	22
Bis(2-chloroethyl) ether	SVOA	17	U	17	327	U	327	17	U	17	331	U	331	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	110	JB	46	327	U	327	110	JB	46	273	J	331	110	JB	44
Butylbenzylphthalate	SVOA	43	U	43	327	U	327	43	U	43	331	U	331	41	U	41
Carbazole	SVOA	36	U	36	327	U	327	36	U	36	331	U	331	35	U	35
Chrysene	SVOA	120	J	27	441		327	27	U	27	331	U	331	26	U	26
Dibenz[a,h]anthracene	SVOA	19	U	19	96.2	J	327	19	U	19	331	U	331	18	U	18
Dibenzofuran	SVOA	20	U	20	327	U	327	20	U	20	331	U	331	19	U	19
Diethyl phthalate	SVOA	26	U	26	327	U	327	26	U	26	331	U	331	25	U	25
Dimethyl phthalate	SVOA	23	U	23	327	U	327	23	U	23	331	U	331	22	U	22
Di-n-butylphthalate	SVOA	29	U	29	327	U	327	29	U	29	331	U	331	28	U	28
Di-n-octylphthalate	SVOA	15	U	15	327	U	327	14	U	14	331	U	331	14	U	14
Fluoranthene	SVOA	210	J	36	816		327	36	U	36	331	U	331	35	U	35
Fluorene	SVOA	18	U	18	327	U	327	18	U	18	331	U	331	17	U	17
Hexachlorobenzene	SVOA	29	U	29	327	U	327	29	U	29	331	U	331	28	U	28
Hexachlorobutadiene	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
Hexachlorocyclopentadiene	SVOA	50	U	50	327	U	327	50	U	50	331	U	331	48	U	48
Hexachloroethane	SVOA	22	U	22	327	U	327	21	U	21	331	U	331	20	U	20
Indeno(1,2,3-cd)pyrene	SVOA	110	J	22	243	J	327	22	U	22	331	U	331	21	U	21
Isophorone	SVOA	17	U	17	327	U	327	17	U	17	331	U	331	16	U	16
Naphthalene	SVOA	31	U	31	327	U	327	31	U	31	331	U	331	30	U	30
Nitrobenzene	SVOA	22	U	22	327	U	327	22	U	22	331	U	331	21	U	21
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	327	U	327	31	U	31	331	U	331	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21	327	U	327	21	U	21	331	U	331	20	U	20
Pentachlorophenol	SVOA	330	U	330	1640	U	1640	330	U	330	1650	U	1650	320	U	320
Phenanthrene	SVOA	62	J	17	318	J	327	17	U	17	331	U	331	16	U	16
Phenol	SVOA	18	U	18	327	U	327	18	U	18	331	U	331	17	U	17
Pyrene	SVOA	190	J	12	637		327	12	U	12	331	U	331	12	U	12

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-3 - J19YH9			SPA-3 re-sample 1, J1FKL9			SPA-5 - J19YJ1			SPA-5 re-sample 1, J1FKM1			SPA-6 - J19YJ2		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	332	U	332	27	U	27	331	U	331	29	U	29	326	U	326
1,2-Dichlorobenzene	SVOA	332	U	332	22	U	22	331	U	331	23	U	23	326	U	326
1,3-Dichlorobenzene	SVOA	332	U	332	12	U	12	331	U	331	12	U	12	326	U	326
1,4-Dichlorobenzene	SVOA	332	U	332	13	U	13	331	U	331	14	U	14	326	U	326
2,4,5-Trichlorophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2,4,6-Trichlorophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2,4-Dichlorophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2,4-Dimethylphenol	SVOA	332	U	332	65	U	65	331	U	331	68	U	68	326	U	326
2,4-Dinitrophenol	SVOA	1660	U	1660	330	U	330	1650	U	1650	340	U	340	1630	U	1630
2,4-Dinitrotoluene	SVOA	332	U	332	65	U	65	331	U	331	68	U	68	326	U	326
2,6-Dinitrotoluene	SVOA	332	U	332	27	U	27	331	U	331	29	U	29	326	U	326
2-Chloronaphthalene	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2-Chlorophenol	SVOA	332	U	332	21	U	21	331	U	331	21	U	21	326	U	326
2-Methylnaphthalene	SVOA	332	U	332	19	U	19	331	U	331	19	U	19	326	U	326
2-Methylphenol (cresol, o-)	SVOA	332	U	332	13	U	13	331	U	331	13	U	13	326	U	326
2-Nitroaniline	SVOA	1660	U	1660	49	U	49	1650	U	1650	51	U	51	1630	U	1630
2-Nitrophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
3,3'-Dichlorobenzidine	SVOA	664	U	664	88	U	88	662	U	662	92	U	92	651	U	651
3+4 Methylphenol (cresol, m+p)	SVOA	332	U	332	32	U	32	331	U	331	34	U	34	326	U	326
3-Nitroaniline	SVOA	1660	U	1660	71	U	71	1650	U	1650	75	U	75	1630	U	1630
4,6-Dinitro-2-methylphenol	SVOA	332	U	332	320	U	320	331	U	331	340	U	340	326	U	326
4-Bromophenylphenyl ether	SVOA	332	U	332	19	U	19	331	U	331	19	U	19	326	U	326
4-Chloro-3-methylphenol	SVOA	332	U	332	65	U	65	331	U	331	68	U	68	326	U	326
4-Chloroaniline	SVOA	332	U	332	80	U	80	331	U	331	84	U	84	326	U	326
4-Chlorophenylphenyl ether	SVOA	332	U	332	21	U	21	331	U	331	21	U	21	326	U	326
4-Nitroaniline	SVOA	1660	U	1660	71	U	71	1650	U	1650	74	U	74	1630	U	1630
4-Nitrophenol	SVOA	1660	U	1660	95	U	95	1650	U	1650	99	U	99	1630	U	1630
Acenaphthene	SVOA	332	U	332	15	J	10	331	U	331	11	U	11	326	U	326
Acenaphthylene	SVOA	332	U	332	17	U	17	331	U	331	17	U	17	326	U	326
Anthracene	SVOA	332	U	332	31	J	17	331	U	331	17	U	17	326	U	326
Benzo(a)anthracene	SVOA	332	U	332	69	J	20	331	U	331	66	J	20	179	J	326
Benzo(a)pyrene	SVOA	332	U	332	100	J	20	331	U	331	110	J	20	176	J	326
Benzo(b)fluoranthene	SVOA	332	U	332	110	JX	26	331	U	331	120	JX	27	172	J	326
Benzo(ghi)perylene	SVOA	332	U	332	31	J	16	331	U	331	46	J	16	77.4	J	326
Benzo(k)fluoranthene	SVOA	332	U	332	39	UX	39	331	U	331	41	UX	41	180	J	326
Bis(2-chloro-1-methylethyl)ether	SVOA	332	U	332	23	U	23	331	U	331	24	U	24	326	U	326
Bis(2-Chloroethoxy)methane	SVOA	332	U	332	23	U	23	331	U	331	24	U	24	326	U	326
Bis(2-chloroethyl) ether	SVOA	332	U	332	16	U	16	331	U	331	17	U	17	326	U	326
Bis(2-ethylhexyl) phthalate	SVOA	332	U	332	100	JB	45	331	U	331	130	JB	47	326	U	326
Butylbenzylphthalate	SVOA	332	U	332	42	U	42	331	U	331	44	U	44	326	U	326
Carbazole	SVOA	332	U	332	35	U	35	331	U	331	37	U	37	326	U	326
Chrysene	SVOA	332	U	332	69	J	26	331	U	331	63	J	28	194	J	326
Dibenz[a,h]anthracene	SVOA	332	U	332	19	U	19	331	U	331	19	U	19	326	U	326
Dibenzofuran	SVOA	332	U	332	20	U	20	331	U	331	20	U	20	326	U	326
Diethyl phthalate	SVOA	332	U	332	25	U	25	331	U	331	27	U	27	326	U	326
Dimethyl phthalate	SVOA	332	U	332	23	U	23	331	U	331	24	U	24	326	U	326
Di-n-butylphthalate	SVOA	332	U	332	28	U	28	331	U	331	30	U	30	326	U	326
Di-n-octylphthalate	SVOA	332	U	332	14	U	14	331	U	331	15	U	15	326	U	326
Fluoranthene	SVOA	332	U	332	140	J	35	331	U	331	99	J	37	366		326
Fluorene	SVOA	332	U	332	18	U	18	331	U	331	18	U	18	326	U	326
Hexachlorobenzene	SVOA	332	U	332	28	U	28	331	U	331	30	U	30	326	U	326
Hexachlorobutadiene	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
Hexachlorocyclopentadiene	SVOA	332	U	332	49	U	49	331	U	331	51	U	51	326	U	326
Hexachloroethane	SVOA	332	U	332	21	U	21	331	U	331	22	U	22	326	U	326
Indeno(1,2,3-cd)pyrene	SVOA	332	U	332	75	J	22	331	U	331	91	J	23	83.1	J	326
Isophorone	SVOA	332	U	332	17	U	17	331	U	331	17	U	17	326	U	326
Naphthalene	SVOA	332	U	332	30	U	30	331	U	331	32	U	32	326	U	326
Nitrobenzene	SVOA	332	U	332	22	U	22	331	U	331	23	U	23	326	U	326
N-Nitroso-di-n-dipropylamine	SVOA	332	U	332	30	U	30	331	U	331	32	U	32	326	U	326
N-Nitrosodiphenylamine	SVOA	332	U	332	21	U	21	331	U	331	21	U	21	326	U	326
Pentachlorophenol	SVOA	1660	U	1660	320	U	320	1650	U	1650	340	U	340	1630	U	1630
Phenanthrene	SVOA	332	U	332	110	J	17	331	U	331	33	J	17	171	J	326
Phenol	SVOA	332	U	332	18	U	18	331	U	331	18	U	18	326	U	326
Pyrene	SVOA	332	U	332	120	J	12	331	U	331	92	J	12	309	J	326

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-6 re-sample 1, J1FKM2			SPA-7 - J19YJ3			SPA-7 re-sample 1, J1FKM3			SPA-8 - J19YJ4			SPA-8 re-sample 1, J1FKM4		
		3/17/11			5/17/10			3/17/11			5/17/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	331	U	331	30	U	30	331	U	331	29	U	29
1,2-Dichlorobenzene	SVOA	23	U	23	331	U	331	24	U	24	331	U	331	23	U	23
1,3-Dichlorobenzene	SVOA	13	U	13	331	U	331	13	U	13	331	U	331	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	331	U	331	15	U	15	331	U	331	14	U	14
2,4,5-Trichlorophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2,4,6-Trichlorophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2,4-Dichlorophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2,4-Dimethylphenol	SVOA	70	U	70	331	U	331	71	U	71	331	U	331	68	U	68
2,4-Dinitrophenol	SVOA	350	U	350	1660	U	1660	360	U	360	1660	U	1660	340	U	340
2,4-Dinitrotoluene	SVOA	70	U	70	331	U	331	71	U	71	331	U	331	68	U	68
2,6-Dinitrotoluene	SVOA	30	U	30	331	U	331	30	U	30	331	U	331	29	U	29
2-Chloronaphthalene	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2-Chlorophenol	SVOA	22	U	22	331	U	331	23	U	23	331	U	331	22	U	22
2-Methylnaphthalene	SVOA	20	U	20	331	U	331	20	U	20	331	U	331	20	U	20
2-Methylphenol (cresol, o-)	SVOA	14	U	14	331	U	331	14	U	14	331	U	331	13	U	13
2-Nitroaniline	SVOA	53	U	53	1660	U	1660	54	U	54	1660	U	1660	52	U	52
2-Nitrophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
3,3'-Dichlorobenzidine	SVOA	95	U	95	663	U	663	97	U	97	663	U	663	93	U	93
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	331	U	331	36	U	36	331	U	331	34	U	34
3-Nitroaniline	SVOA	77	U	77	1660	U	1660	79	U	79	1660	U	1660	75	U	75
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	331	U	331	360	U	360	331	U	331	340	U	340
4-Bromophenylphenyl ether	SVOA	20	U	20	331	U	331	20	U	20	331	U	331	20	U	20
4-Chloro-3-methylphenol	SVOA	70	U	70	331	U	331	71	U	71	331	U	331	68	U	68
4-Chloroaniline	SVOA	87	U	87	331	U	331	88	U	88	331	U	331	84	U	84
4-Chlorophenylphenyl ether	SVOA	22	U	22	331	U	331	23	U	23	331	U	331	22	U	22
4-Nitroaniline	SVOA	77	U	77	1660	U	1660	78	U	78	1660	U	1660	75	U	75
4-Nitrophenol	SVOA	100	U	100	1660	U	1660	100	U	100	1660	U	1660	100	U	100
Acenaphthene	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	11	U	11
Acenaphthylene	SVOA	18	U	18	331	U	331	18	U	18	331	U	331	18	U	18
Anthracene	SVOA	18	U	18	331	U	331	20	J	18	331	U	331	18	U	18
Benzo(a)anthracene	SVOA	29	J	21	70.2	J	331	90	J	22	91.6	J	331	21	U	21
Benzo(a)pyrene	SVOA	85	J	21	66.9	J	331	130	J	22	90.1	J	331	71	J	21
Benzo(b)fluoranthene	SVOA	56	JX	28	62.7	J	331	130	JX	28	88.5	J	331	27	U	27
Benzo(ghi)perylene	SVOA	23	J	17	331	U	331	64	J	17	331	U	331	16	U	16
Benzo(k)fluoranthene	SVOA	42	UX	42	65.8	J	331	43	UX	43	91.5	J	331	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	331	U	331	25	U	25	331	U	331	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	331	U	331	25	U	25	331	U	331	24	U	24
Bis(2-chloroethyl) ether	SVOA	18	U	18	331	U	331	18	U	18	331	U	331	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	130	JB	49	331	U	331	120	JB	49	331	U	331	120	JB	47
Butylbenzylphthalate	SVOA	46	U	46	331	U	331	46	U	46	331	U	331	44	U	44
Carbazole	SVOA	38	U	38	331	U	331	39	U	39	331	U	331	37	U	37
Chrysene	SVOA	29	J	29	77.9	J	331	94	J	29	96.8	J	331	28	U	28
Dibenz[a,h]anthracene	SVOA	20	U	20	331	U	331	20	U	20	331	U	331	20	U	20
Dibenzofuran	SVOA	21	U	21	331	U	331	22	U	22	331	U	331	21	U	21
Diethyl phthalate	SVOA	28	U	28	331	U	331	28	U	28	331	U	331	27	U	27
Dimethyl phthalate	SVOA	24	U	24	331	U	331	25	U	25	331	U	331	24	U	24
Di-n-butylphthalate	SVOA	31	U	31	331	U	331	31	U	31	331	U	331	30	U	30
Di-n-octylphthalate	SVOA	15	U	15	331	U	331	15	U	15	331	U	331	15	U	15
Fluoranthene	SVOA	48	J	38	138	J	331	190	J	39	181	J	331	37	U	37
Fluorene	SVOA	19	U	19	331	U	331	19	U	19	331	U	331	19	U	19
Hexachlorobenzene	SVOA	31	U	31	331	U	331	31	U	31	331	U	331	30	U	30
Hexachlorobutadiene	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
Hexachlorocyclopentadiene	SVOA	53	U	53	331	U	331	54	U	54	331	U	331	52	U	52
Hexachloroethane	SVOA	23	U	23	331	U	331	23	U	23	331	U	331	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	75	J	23	331	U	331	97	J	24	331	U	331	63	J	23
Isophorone	SVOA	18	U	18	331	U	331	18	U	18	331	U	331	18	U	18
Naphthalene	SVOA	33	U	33	331	U	331	33	U	33	331	U	331	32	U	32
Nitrobenzene	SVOA	23	U	23	331	U	331	24	U	24	331	U	331	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	331	U	331	33	U	33	331	U	331	32	U	32
N-Nitrosodiphenylamine	SVOA	22	U	22	331	U	331	23	U	23	331	U	331	22	U	22
Pentachlorophenol	SVOA	350	U	350	1660	U	1660	360	U	360	1660	U	1660	340	U	340
Phenanthrene	SVOA	23	J	18	64.2	J	331	120	J	18	105	J	331	19	J	18
Phenol	SVOA	19	U	19	331	U	331	19	U	19	331	U	331	19	U	19
Pyrene	SVOA	52	J	13	118	J	331	210	J	13	154	J	331	38	J	12

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-9 - J19YJ5			SPA-9 re-sample 1, J1FKM5			SPA-10 - J19YJ6			SPA-10 re-sample 1, J1FKM6			SPA-11 - J19YJ7		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	330	U	330	30	U	30	330	U	330	28	U	28	330	U	330
1,2-Dichlorobenzene	SVOA	330	U	330	24	U	24	330	U	330	22	U	22	330	U	330
1,3-Dichlorobenzene	SVOA	330	U	330	13	U	13	330	U	330	12	U	12	330	U	330
1,4-Dichlorobenzene	SVOA	330	U	330	15	U	15	330	U	330	14	U	14	330	U	330
2,4,5-Trichlorophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2,4,6-Trichlorophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2,4-Dichlorophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2,4-Dimethylphenol	SVOA	330	U	330	72	U	72	330	U	330	66	U	66	330	U	330
2,4-Dinitrophenol	SVOA	1650	U	1650	360	U	360	1650	U	1650	330	U	330	1650	U	1650
2,4-Dinitrotoluene	SVOA	330	U	330	72	U	72	330	U	330	66	U	66	330	U	330
2,6-Dinitrotoluene	SVOA	330	U	330	30	U	30	330	U	330	28	U	28	330	U	330
2-Chloronaphthalene	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2-Chlorophenol	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
2-Methylnaphthalene	SVOA	330	U	330	21	U	21	330	U	330	19	U	19	330	U	330
2-Methylphenol (cresol, o-)	SVOA	330	U	330	14	U	14	330	U	330	13	U	13	330	U	330
2-Nitroaniline	SVOA	1650	U	1650	54	U	54	1650	U	1650	50	U	50	1650	U	1650
2-Nitrophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
3,3'-Dichlorobenzidine	SVOA	661	U	661	98	U	98	660	U	660	90	U	90	660	U	660
3+4 Methylphenol (cresol, m+p)	SVOA	330	U	330	36	U	36	330	U	330	33	U	33	330	U	330
3-Nitroaniline	SVOA	1650	U	1650	79	U	79	1650	U	1650	73	U	73	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	360	U	360	330	U	330	330	U	330	330	U	330
4-Bromophenylphenyl ether	SVOA	330	U	330	21	U	21	330	U	330	19	U	19	330	U	330
4-Chloro-3-methylphenol	SVOA	330	U	330	72	U	72	330	U	330	66	U	66	330	U	330
4-Chloroaniline	SVOA	330	U	330	89	U	89	330	U	330	82	U	82	330	U	330
4-Chlorophenylphenyl ether	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
4-Nitroaniline	SVOA	1650	U	1650	79	U	79	1650	U	1650	73	U	73	1650	U	1650
4-Nitrophenol	SVOA	1650	U	1650	110	U	110	1650	U	1650	98	U	98	1650	U	1650
Acenaphthene	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
Acenaphthylene	SVOA	330	U	330	18	U	18	330	U	330	17	U	17	330	U	330
Anthracene	SVOA	59.8	J	330	18	U	18	330	U	330	17	U	17	330	U	330
Benzo(a)anthracene	SVOA	283	J	330	22	U	22	84.4	J	330	20	U	20	121	J	330
Benzo(a)pyrene	SVOA	268	J	330	69	J	22	96.3	J	330	20	U	20	123	J	330
Benzo(b)fluoranthene	SVOA	260	J	330	28	U	28	97.3	J	330	26	U	26	119	J	330
Benzo(ghi)perylene	SVOA	115	J	330	17	U	17	330	U	330	16	U	16	54.7	J	330
Benzo(k)fluoranthene	SVOA	269	J	330	43	U	43	93.6	J	330	40	U	40	117	J	330
Bis(2-chloro-1-methylethyl)ether	SVOA	330	U	330	25	U	25	330	U	330	23	U	23	330	U	330
Bis(2-Chloroethoxy)methane	SVOA	330	U	330	25	U	25	330	U	330	23	U	23	330	U	330
Bis(2-chloroethyl) ether	SVOA	330	U	330	18	U	18	330	U	330	17	U	17	330	U	330
Bis(2-ethylhexyl) phthalate	SVOA	330	U	330	120	JB	50	330	U	330	110	JB	46	330	U	330
Butylbenzylphthalate	SVOA	330	U	330	47	U	47	330	U	330	43	U	43	330	U	330
Carbazole	SVOA	330	U	330	39	U	39	330	U	330	36	U	36	330	U	330
Chrysene	SVOA	287	J	330	29	U	29	101	J	330	27	U	27	128	J	330
Dibenz[a,h]anthracene	SVOA	66.2	J	330	21	U	21	330	U	330	19	U	19	330	U	330
Dibenzofuran	SVOA	330	U	330	22	U	22	330	U	330	20	U	20	330	U	330
Diethyl phthalate	SVOA	330	U	330	28	U	28	330	U	330	26	U	26	330	U	330
Dimethyl phthalate	SVOA	330	U	330	25	U	25	330	U	330	23	U	23	330	U	330
Di-n-butylphthalate	SVOA	330	U	330	32	U	32	330	U	330	29	U	29	330	U	330
Di-n-octylphthalate	SVOA	330	U	330	16	U	16	330	U	330	14	U	14	330	U	330
Fluoranthene	SVOA	564		330	39	U	39	179	J	330	36	U	36	238	J	330
Fluorene	SVOA	330	U	330	20	U	20	330	U	330	18	U	18	330	U	330
Hexachlorobenzene	SVOA	330	U	330	32	U	32	330	U	330	29	U	29	330	U	330
Hexachlorobutadiene	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
Hexachlorocyclopentadiene	SVOA	330	U	330	54	U	54	330	U	330	50	U	50	330	U	330
Hexachloroethane	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
Indeno(1,2,3-cd)pyrene	SVOA	129	J	330	64	J	24	330	U	330	22	U	22	59.4	J	330
Isophorone	SVOA	330	U	330	18	U	18	330	U	330	17	U	17	330	U	330
Naphthalene	SVOA	330	U	330	34	U	34	330	U	330	31	U	31	330	U	330
Nitrobenzene	SVOA	330	U	330	24	U	24	330	U	330	22	U	22	330	U	330
N-Nitroso-di-n-dipropylamine	SVOA	330	U	330	34	U	34	330	U	330	31	U	31	330	U	330
N-Nitrosodiphenylamine	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
Pentachlorophenol	SVOA	1650	U	1650	360	U	360	1650	U	1650	330	U	330	1650	U	1650
Phenanthrene	SVOA	240	J	330	18	U	18	73.4	J	330	17	U	17	104	J	330
Phenol	SVOA	330	U	330	20	U	20	330	U	330	18	U	18	330	U	330
Pyrene	SVOA	421		330	18	J	13	151	J	330	12	U	12	194	J	330

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-11 re-sample 1, J1FKM7 3/17/11			SPA-12 - J19YJ8 5/17/10			SPA-12 re-sample 1, J1FKM8 3/17/11			Equipment Blank - J19YK0 5/17/10			Equipment Blank re-sample 1, J1FKN0 3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	332	U	332	29	U	29	334	U	334	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	332	U	332	23	U	23	334	U	334	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	332	U	332	12	U	12	334	U	334	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	332	U	332	14	U	14	334	U	334	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2,4-Dichlorophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2,4-Dimethylphenol	SVOA	65	U	65	332	U	332	68	U	68	334	U	334	66	U	66
2,4-Dinitrophenol	SVOA	330	U	330	1660	U	1660	340	U	340	1670	U	1670	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65	332	U	332	68	U	68	334	U	334	66	U	66
2,6-Dinitrotoluene	SVOA	28	U	28	332	U	332	29	U	29	334	U	334	28	U	28
2-Chloronaphthalene	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2-Chlorophenol	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	332	U	332	19	U	19	334	U	334	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	332	U	332	13	U	13	334	U	334	13	U	13
2-Nitroaniline	SVOA	49	U	49	1660	U	1660	51	U	51	1670	U	1670	50	U	50
2-Nitrophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
3,3'-Dichlorobenzidine	SVOA	89	U	89	663	U	663	92	U	92	668	U	668	90	U	90
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	332	U	332	34	U	34	334	U	334	33	U	33
3-Nitroaniline	SVOA	72	U	72	1660	U	1660	75	U	75	1670	U	1670	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	332	U	332	340	U	340	334	U	334	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	332	U	332	19	U	19	334	U	334	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	332	U	332	68	U	68	334	U	334	66	U	66
4-Chloroaniline	SVOA	81	U	81	332	U	332	84	U	84	334	U	334	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
4-Nitroaniline	SVOA	71	U	71	1660	U	1660	74	U	74	1670	U	1670	72	U	72
4-Nitrophenol	SVOA	95	U	95	1660	U	1660	99	U	99	1670	U	1670	96	U	96
Acenaphthene	SVOA	10	U	10	332	U	332	11	U	11	334	U	334	10	U	10
Acenaphthylene	SVOA	17	U	17	332	U	332	17	U	17	334	U	334	17	U	17
Anthracene	SVOA	17	U	17	332	U	332	17	U	17	334	U	334	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	117	J	332	21	U	21	334	U	334	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	108	J	332	70	J	21	334	U	334	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	102	J	332	27	JX	27	334	U	334	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	117	J	332	16	U	16	334	U	334	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	90.8	J	332	41	UX	41	334	U	334	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	332	U	332	24	U	24	334	U	334	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	332	U	332	24	U	24	334	U	334	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	332	U	332	17	U	17	334	U	334	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	110	JB	45	332	U	332	130	JB	47	334	U	334	120	JB	46
Butylbenzylphthalate	SVOA	42	U	42	332	U	332	44	U	44	334	U	334	43	U	43
Carbazole	SVOA	35	U	35	332	U	332	37	U	37	334	U	334	36	U	36
Chrysene	SVOA	27	U	27	117	J	332	28	U	28	334	U	334	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	332	U	332	19	U	19	334	U	334	19	U	19
Dibenzofuran	SVOA	20	U	20	332	U	332	21	U	21	334	U	334	20	U	20
Diethyl phthalate	SVOA	26	U	26	332	U	332	27	U	27	116	J	334	26	U	26
Dimethyl phthalate	SVOA	23	U	23	332	U	332	24	U	24	334	U	334	23	U	23
Di-n-butylphthalate	SVOA	29	U	29	332	U	332	30	U	30	58.7	J	334	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	332	U	332	15	U	15	334	U	334	14	U	14
Fluoranthene	SVOA	35	U	35	223	J	332	37	U	37	334	U	334	36	U	36
Fluorene	SVOA	18	U	18	332	U	332	18	U	18	334	U	334	18	U	18
Hexachlorobenzene	SVOA	29	U	29	332	U	332	30	U	30	334	U	334	29	U	29
Hexachlorobutadiene	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	49	U	49	332	U	332	51	U	51	334	U	334	50	U	50
Hexachloroethane	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	90.8	J	332	64	J	23	334	U	334	22	U	22
Isophorone	SVOA	17	U	17	332	U	332	17	U	17	334	U	334	17	U	17
Naphthalene	SVOA	31	U	31	332	U	332	32	U	32	334	U	334	31	U	31
Nitrobenzene	SVOA	22	U	22	332	U	332	23	U	23	334	U	334	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	332	U	332	32	U	32	334	U	334	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
Pentachlorophenol	SVOA	320	U	320	1660	U	1660	340	U	340	1670	U	1670	330	U	330
Phenanthrene	SVOA	17	U	17	111	J	332	17	U	17	334	U	334	17	U	17
Phenol	SVOA	18	U	18	332	U	332	18	U	18	334	U	334	18	U	18
Pyrene	SVOA	12	U	12	172	J	332	28	J	12	334	U	334	12	U	12

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Equipment Blank re-sample 2, J1HH87 4/13/11		
		ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8
2,4-Dichlorophenol	SVOA	9.8	U	9.8
2,4-Dimethylphenol	SVOA	65	U	65
2,4-Dinitrophenol	SVOA	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65
2,6-Dinitrotoluene	SVOA	27	U	27
2-Chloronaphthalene	SVOA	9.8	U	9.8
2-Chlorophenol	SVOA	21	U	21
2-Methylnaphthalene	SVOA	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13
2-Nitroaniline	SVOA	49	U	49
2-Nitrophenol	SVOA	9.8	U	9.8
3,3'-Dichlorobenzidine	SVOA	88	U	88
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32
3-Nitroaniline	SVOA	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65
4-Chloroaniline	SVOA	80	U	80
4-Chlorophenylphenyl ether	SVOA	21	U	21
4-Nitroaniline	SVOA	71	U	71
4-Nitrophenol	SVOA	95	U	95
Acenaphthene	SVOA	10	U	10
Acenaphthylene	SVOA	17	U	17
Anthracene	SVOA	17	U	17
Benzo(a)anthracene	SVOA	20	U	20
Benzo(a)pyrene	SVOA	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	71	JB	45
Butylbenzylphthalate	SVOA	42	U	42
Carbazole	SVOA	35	U	35
Chrysene	SVOA	26	U	26
Dibenz[a,h]anthracene	SVOA	19	U	19
Dibenzofuran	SVOA	20	U	20
Diethyl phthalate	SVOA	25	U	25
Dimethyl phthalate	SVOA	23	U	23
Di-n-butylphthalate	SVOA	28	U	28
Di-n-octylphthalate	SVOA	14	U	14
Fluoranthene	SVOA	35	U	35
Fluorene	SVOA	18	U	18
Hexachlorobenzene	SVOA	28	U	28
Hexachlorobutadiene	SVOA	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	49	U	49
Hexachloroethane	SVOA	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22
Isophorone	SVOA	17	U	17
Naphthalene	SVOA	30	U	30
Nitrobenzene	SVOA	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21
Pentachlorophenol	SVOA	320	U	320
Phenanthrene	SVOA	17	U	17
Phenol	SVOA	18	U	18
Pyrene	SVOA	12	U	12

Attachment	1	Sheet No.	72 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Bromide			Chloride			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in Nitrite [b]		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	2.8	U	2.8	2.8	U	2.8	0.7	B	2.8	0.59	JB	0.63	0.85	UR	0.85
Duplicate of J19YB9	J19YD0	5/18/10	2.5	U	2.5	2.5	U	2.5	0.8	B	2.5	0.84		0.56	0.76	U	0.76
SZ-1	J19YB8	5/18/10	2.6	U	2.6	2.6	U	2.6	0.5	B	2.6	0.84	J	0.59	0.79	UR	0.79
SZ-3	J19YC0	5/18/10	2.2	U	2.2	2.2	U	2.2	0.7	B	2.2	0.18	JB	0.50	0.67	UR	0.67
SZ-4	J19YC1	5/18/10	2.6	U	2.6	2.6	U	2.6	0.8	B	2.6	1.06	J	0.59	0.79	UR	0.79
SZ-5	J19YC2	5/18/10	2.5	U	2.5	2.5	U	2.5	0.4	B	2.5	1.81	J	0.56	0.76	UR	0.76
SZ-6	J19YC3	5/18/10	2.6	U	2.6	2.6	U	2.6	0.4	B	2.6	1.94	J	0.59	0.79	UR	0.79
SZ-7	J19YC4	5/18/10	2.5	U	2.5	2.5	U	2.5	0.9	B	2.5	0.75	J	0.56	0.76	UR	0.76
SZ-8	J19YC5	5/18/10	2.5	U	2.5	2.5	U	2.5	0.9	B	2.5	3.37	J	0.56	0.76	UR	0.76
SZ-9	J19YC6	5/18/10	2.5	U	2.5	2.5	U	2.5	1.2	B	2.5	2.64	J	0.56	0.76	UR	0.76
SZ-9 re-sample 1	J1FKL4	3/16/11	0.41	U	0.41	2.1	B	2.1	1.5	B	0.88	1.1	B	0.34	0.36	U	0.36
SZ-10	J19YC7	5/18/10	2.4	U	2.4	2.4	U	2.4	0.5	B	2.4	2.08	J	0.54	0.73	UR	0.73
SZ-11	J19YC8	5/18/10	2.5	U	2.5	2.5	U	2.5	1.3	B	2.5	0.99		0.56	0.76	U	0.76
SZ-11 re-sample 1	J1FKL5	3/16/11	0.38	U	0.38	2.0	U	2.0	0.81	U	0.81	0.4	B	0.31	0.33	U	0.33
SZ-12	J19YC9	5/18/10	2.3	U	2.3	2.3	U	2.3	2.3	U	2.3	0.77		0.52	0.70	U	0.70
DZ-1	J19YD1	5/18/10	2.3	U	2.3	2.3	U	2.3	0.9	B	2.3	2.78	J	0.52	0.70	UR	0.70
Duplicate of J19YD1	J19YF3	5/18/10	2.4	U	2.4	2.4	U	2.4	1.2	B	2.4	2.64		0.54	0.73	U	0.73
DZ-2	J19YD2	5/18/10	2.2	U	2.2	2.2	U	2.2	0.6	B	2.2	1.02	J	0.50	0.67	UR	0.67
DZ-3	J19YD3	5/18/10	2.4	U	2.4	17.6		2.4	0.7	B	2.4	55.8	JD	2.76	0.40	JB	0.73
DZ-4	J19YD4	5/18/10	2.6	U	2.6	5.1		2.6	0.9	B	2.6	26.7	JD	1.20	0.79	UR	0.79
DZ-5	J19YD5	5/18/10	2.5	U	2.5	2.5	U	2.5	1.7	B	2.5	2.26	J	0.56	0.76	UR	0.76
DZ-6	J19YD6	5/18/10	2.4	U	2.4	2.4	U	2.4	1.0	B	2.4	7.59	J	0.54	0.73	UR	0.73
DZ-7	J19YD7	5/18/10	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	5.38	J	0.59	0.79	UR	0.79
DZ-8	J19YD8	5/18/10	2.5	U	2.5	2.5	U	2.5	0.6	B	2.5	1.13	J	0.56	0.76	UR	0.76
DZ-9	J19YD9	5/18/10	2.4	U	2.4	2.4	U	2.4	0.3	B	2.4	0.79	J	0.54	0.73	UR	0.73
DZ-10	J19YF0	5/18/10	2.5	U	2.5	2.5	U	2.5	0.4	B	2.5	3.19	J	0.56	0.76	UR	0.76
DZ-11	J19YF1	5/18/10	2.5	U	2.5	2.5	U	2.5	1.1	B	2.5	4.02		0.56	0.76	U	0.76
DZ-12	J19YF2	5/18/10	2.3	U	2.3	2.9		2.3	1.1	B	2.3	5.11		0.52	0.70	U	0.70

Attachment	1	Sheet No.	73 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Nitrogen in Nitrite and Nitrate			Phosphorous in phosphate [b]			Sulfate			TPH - diesel range			TPH - motor oil (high boiling)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.49		0.22	1.3	J	0.9	2.6	B	2.8	3830	U	3830	11500	UJ	11500
Duplicate of J19YB9	J19YD0	5/18/10	0.62		0.19	4.2		2.5	3.2		2.5	3410	U	3410	10200	U	10200
SZ-1	J19YB8	5/18/10	1.4		0.22	1.9	JB	2.6	3.2		2.6	3490	U	3490	10500	UJ	10500
SZ-3	J19YC0	5/18/10	0.15	B	0.19	9.8	J	2.2	1.9	B	2.2	3310	U	3310	27600	J	9940
SZ-4	J19YC1	5/18/10	0.69		0.22	2.3	JB	2.6	4.6		2.6	3430	U	3430	4760	J	10300
SZ-5	J19YC2	5/18/10	1.17		0.21	3.5	J	2.5	5.4		2.5	3530	U	3530	10600	UJ	10600
SZ-6	J19YC3	5/18/10	1.03		0.22	7.5	J	2.6	10.2		2.6	3350	U	3350	4330	J	10000
SZ-7	J19YC4	5/18/10	0.67		0.20	2.4	JB	2.5	6.2		2.5	3480	U	3480	4900	J	10400
SZ-8	J19YC5	5/18/10	2.43		0.20	6.8	J	2.5	14.3		2.5	3440	U	3440	3850	J	10300
SZ-9	J19YC6	5/18/10	1.82		0.22	3.2	J	2.5	5.7		2.5	3410	U	3410	29900	J	10200
SZ-9 re-sample 1	J1FKL4	3/16/11	0.53	BMN	0.38	1.3	U	1.3	5.8		1.8	2600	J	720			
SZ-10	J19YC7	5/18/10	1.68		0.22	2.8	J	2.4	9.3		2.4	3410	U	3410	4620	J	10200
SZ-11	J19YC8	5/18/10	0.68		0.21	2.1	B	2.5	3.9		2.5	3440	U	3440	6290	J	10300
SZ-11 re-sample 1	J1FKL5	3/16/11	0.37	U	0.37	2.5	BC	1.2	2.1	B	1.7	700	U	700			
SZ-12	J19YC9	5/18/10	0.52		0.19	2.3	U	2.3	2.6		2.3	3420	U	3420	10200	U	10200
DZ-1	J19YD1	5/18/10	1.7		0.21	2.5	J	2.3	7.8		2.3	3400	U	3400	5670	J	10200
Duplicate of J19YD1	J19YF3	5/18/10	1.62		0.22	3.2		2.4	8.4		2.4	3450	U	3450	3480	J	10400
DZ-2	J19YD2	5/18/10	0.66		0.22	1.0	JB	2.2	4.9		2.2	3470	U	3470	10400	UJ	10400
DZ-3	J19YD3	5/18/10	43.4	D	2.12	1.0	JB	2.4	160	JD	12.2	3540	U	3540	10600	UJ	10600
DZ-4	J19YD4	5/18/10	22.7	D	1.03	1.9	JB	2.6	101		2.6	3440	U	3440	10300	UJ	10300
DZ-5	J19YD5	5/18/10	1.4		0.22	4.9	J	2.5	8.1		2.5	3450	U	3450	9290	J	10400
DZ-6	J19YD6	5/18/10	5.36		0.22	2.5	J	2.4	17.6		2.4	3500	U	3500	10500	UJ	10500
DZ-7	J19YD7	5/18/10	5.67		0.23	2.3	JB	2.6	19.2		2.6	3490	U	3490	127000	J	10500
DZ-8	J19YD8	5/18/10	0.79		0.23	2.3	JB	2.5	10.3		2.5	3440	U	3440	4230	J	10300
DZ-9	J19YD9	5/18/10	0.63		0.21	1.7	JB	2.4	5.8		2.4	3460	U	3460	18700	J	10400
DZ-10	J19YF0	5/18/10	2.08		0.21	3.5	J	2.5	11.3		2.5	3460	U	3460	6750	J	10400
DZ-11	J19YF1	5/18/10	2.94		0.22	4.0		2.5	18.6		2.5	3510	U	3510	6760	J	10500
DZ-12	J19YF2	5/18/10	4.37		0.20	2.2	B	2.3	25.3		2.3	3370	U	3370	8670	J	10100

Attachment	1	Sheet No.	74 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	TPH diesel range EXT			Percent Solids			pH Measurement		
			ug/kg	Q	PQL	%	Q	PQL	pH unit	Q	PQL
SZ-2	J19YB9	5/18/10				86.1		0.1			
Duplicate of J19YB9	J19YD0	5/18/10				97.2		0.1			
SZ-1	J19YB8	5/18/10				94.9		0.1			
SZ-3	J19YC0	5/18/10				99.0		0.1			
SZ-4	J19YC1	5/18/10				95.6		0.1			
SZ-5	J19YC2	5/18/10				94.5		0.1			
SZ-6	J19YC3	5/18/10				96.4		0.1			
SZ-7	J19YC4	5/18/10				95.3		0.1			
SZ-8	J19YC5	5/18/10				96.2		0.1			
SZ-9	J19YC6	5/18/10				95.0		0.1			
SZ-9 re-sample 1	J1FKL4	3/16/11	8100		1100				9.34		0.01
SZ-10	J19YC7	5/18/10				97.0		0.1			
SZ-11	J19YC8	5/18/10				96.4		0.1			
SZ-11 re-sample 1	J1FKL5	3/16/11	1200	J	1000				9.44		0.01
SZ-12	J19YC9	5/18/10				97.0		0.1			
DZ-1	J19YD1	5/18/10				95.6		0.1			
Duplicate of J19YD1	J19YF3	5/18/10				96.1		0.1			
DZ-2	J19YD2	5/18/10				94.9		0.1			
DZ-3	J19YD3	5/18/10				93.5		0.1			
DZ-4	J19YD4	5/18/10				94.5		0.1			
DZ-5	J19YD5	5/18/10				94.7		0.1			
DZ-6	J19YD6	5/18/10				94.8		0.1			
DZ-7	J19YD7	5/18/10				94.0		0.1			
DZ-8	J19YD8	5/18/10				94.0		0.1			
DZ-9	J19YD9	5/18/10				95.7		0.1			
DZ-10	J19YF0	5/18/10				95.4		0.1			
DZ-11	J19YF1	5/18/10				94.3		0.1			
DZ-12	J19YF2	5/18/10				97.2		0.1			

Attachment	1	Sheet No.	75 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Bromide			Chloride			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in Nitrite [b]		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	2.5	U	2.5	2.5	U	2.5	0.8	B	2.5	0.70		0.56	0.76	U	0.76
Duplicate of J19YF8	J19YH6	5/13/10	2.5	U	2.5	2.5	U	2.5	0.5	B	2.5	0.81		0.56	0.76	U	0.76
OB-1	J19YF4	5/13/10	2.5	U	2.5	20.6		2.5	0.7	B	2.5	0.56	U	0.56	0.76	U	0.76
OB-2	J19YF5	5/13/10	2.3	U	2.3	2.3	U	2.3	0.7	B	2.3	0.52	U	0.52	0.70	U	0.70
OB-3	J19YF6	5/13/10	2.4	U	2.4	2.4	U	2.4	0.7	B	2.4	1.29		0.54	0.73	U	0.73
OB-4	J19YF7	5/13/10	2.2	U	2.2	3.6		2.2	0.6	B	2.2	0.52		0.50	0.67	U	0.67
OB-6	J19YF9	5/13/10	2.3	U	2.3	2.3	U	2.3	0.8	B	2.3	1.60		0.52	0.70	U	0.70
OB-7	J19YH0	5/13/10	2.5	U	2.5	6.9		2.5	0.8	B	2.5	0.56	U	0.56	0.76	U	0.76
OB-8	J19YH1	5/13/10	2.3	U	2.3	2.3	U	2.3	0.9	B	2.3	1.31		0.52	0.70	U	0.70
OB-8 re-sample 1	J1FKL6	3/17/11	0.41	U	0.41	2.8	B	2.1	1.1	B	0.88	0.96	B	0.33	0.36	U	0.36
OB-9	J19YH2	5/13/10	2.4	U	2.4	2.4	U	2.4	0.7	B	2.4	0.52	B	0.54	0.73	U	0.73
OB-10	J19YH3	5/13/10	2.4	U	2.4	2.4	U	2.4	0.6	B	2.4	2.51		0.54	0.73	U	0.73
OB-11	J19YH4	5/13/10	2.5	U	2.5	2.5	U	2.5	1.0	B	2.5	0.90		0.56	0.76	U	0.76
OB-12	J19YH5	5/13/10	2.4	U	2.4	2.4	U	2.4	0.7	B	2.4	0.86		0.54	0.73	U	0.73
OB-13	J1B4H9	5/17/10	2.3	U	2.3	2.3	U	2.3	0.5	B	2.3	5.08		0.52	0.70	U	0.70
OB-14	J1B4J0	5/17/10	2.3	U	2.3	2.3	U	2.3	0.7	B	2.3	3.10		0.52	0.70	U	0.70
OB-15	J1B4J1	5/17/10	2.2	U	2.2	2.2	U	2.2	0.3	B	2.2	3.23		0.50	0.67	U	0.67
SPA-4	J19YJ0	5/17/10	2.3	U	2.3	2.3	U	2.3	1.1	B	2.3	0.25	B	0.52	0.70	U	0.70
SPA-4 re-sample 1	J1FKM0	3/17/11	0.38	U	0.38	1.9	U	1.9	0.81	U	0.81	0.43	B	0.31	0.33	U	0.33
Duplicate of J1FKM0	J1FKM9	3/17/11	0.40	U	0.40	2.0	U	2.0	0.84	U	0.84	0.41	B	0.32	0.34	U	0.34
SPA-1	J19YH7	5/17/10	2.4	U	2.4	2.4	U	2.4	0.6	B	2.4	0.77		0.54	0.73	U	0.73
SPA-1 re-sample 1	J1FKL7	3/17/11	0.39	U	0.39	2.0	U	2.0	0.83	U	0.83	0.35	B	0.32	0.34	U	0.34
SPA-2	J19YH8	5/17/10	2.3	U	2.3	2.3	U	2.3	0.9	B	2.3	0.52	U	0.52	0.70	U	0.70
SPA-2 re-sample 1	J1FKL8	3/17/11	0.39	U	0.39	2.0	U	2.0	0.82	U	0.82	0.36	B	0.31	0.34	U	0.34
SPA-3	J19YH9	5/17/10	2.5	U	2.5	2.5	U	2.5	1.0	B	2.5	0.56	U	0.56	0.76	U	0.76
SPA-3 re-sample 1	J1FKL9	3/17/11	0.40	U	0.40	2.0	U	2.0	0.85	U	0.85	0.36	B	0.32	0.35	U	0.35
SPA-5	J19YJ1	5/17/10	2.3	U	2.3	2.3	U	2.3	0.5	B	2.3	0.52	U	0.52	0.70	U	0.70
SPA-5 re-sample 1	J1FKM1	3/17/11	0.40	U	0.40	9.5		2.0	0.86	U	0.86	40.1		0.33	0.35	U	0.35
SPA-6	J19YJ2	5/17/10	2.4	U	2.4	2.5		2.4	0.8	B	2.4	0.50	B	0.54	0.73	U	0.73
SPA-6 re-sample 1	J1FKM2	3/17/11	0.42	U	0.42	6.4		2.1	0.95	B	0.89	44.8		0.34	0.36	U	0.36
SPA-7	J19YJ3	5/17/10	2.2	U	2.2	2.2	U	2.2	0.6	B	2.2	0.29	B	0.50	0.67	U	0.67
SPA-7 re-sample 1	J1FKM3	3/17/11	0.39	U	0.39	2.0	U	2.0	1.1	B	0.83	0.61	B	0.32	0.34	U	0.34
SPA-8	J19YJ4	5/17/10	2.4	U	2.4	2.4	U	2.4	0.8	B	2.4	0.38	B	0.54	0.73	U	0.73
SPA-8 re-sample 1	J1FKM4	3/17/11	0.41	U	0.41	2.1	U	2.1	1.8	B	0.87	0.94	B	0.33	0.36	U	0.36
SPA-9	J19YJ5	5/17/10	2.4	U	2.4	2.4	U	2.4	0.8	B	2.4	1.27		0.54	0.73	U	0.73
SPA-9 re-sample 1	J1FKM5	3/17/11	0.43	U	0.43	2.2	U	2.2	0.96	B	0.91	0.55	B	0.35	0.37	U	0.37
SPA-10	J19YJ6	5/17/10	2.4	U	2.4	2.4	U	2.4	0.8	B	2.4	0.20	B	0.54	0.73	U	0.73
SPA-10 re-sample 1	J1FKM6	3/17/11	0.39	U	0.39	2.0	U	2.0	0.88	B	0.82	0.41	B	0.31	0.34	U	0.34
SPA-11	J19YJ7	5/17/10	2.4	U	2.4	2.4	U	2.4	0.6	B	2.4	4.38		0.54	0.73	U	0.73
SPA-11 re-sample 1	J1FKM7	3/17/11	0.39	U	0.39	5.0	B	2.0	1.1	B	0.84	1.1	B	0.32	0.34	U	0.34
SPA-12	J19YJ8	5/17/10	2.4	U	2.4	5.6		2.4	0.8	B	2.4	1.22		0.54	0.73	U	0.73
SPA-12 re-sample 1	J1FKM8	3/17/11	0.40	U	0.40	2.0	U	2.0	0.97	B	0.85	0.76	B	0.32	0.35	U	0.35
Duplicate of J19YJ4	J19YJ9	5/17/10	2.2	U	2.2	2.2	U	2.2	0.8	B	2.2	0.29	B	0.50	0.67	U	0.67
Equipment Blank	J19YK0	5/17/10															

Attachment	1	Sheet No.	76 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Nitrogen in Nitrite and Nitrate			Phosphorous in phosphate [b]			Sulfate			TPH - diesel range			TPH - motor oil (high boiling)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
OB-5	J19YF8	5/13/10	0.66		0.20	2.5	U	2.5	5.6		2.5	3360	U	3360	10100	U	10100
Duplicate of J19YF8	J19YH6	5/13/10	0.75		0.20	1.1	B	2.5	6.2		2.5	3350	U	3350	10000	U	10000
OB-1	J19YF4	5/13/10	0.56		0.20	0.9	B	2.5	2.9		2.5	3350	U	3350	10100	U	10100
OB-2	J19YF5	5/13/10	0.34		0.19	1.0	B	2.3	6.4		2.3	3330	U	3330	9980	U	9980
OB-3	J19YF6	5/13/10	1.41		0.19	1.9	B	2.4	6.6		2.4	3340	U	3340	10000	U	10000
OB-4	J19YF7	5/13/10	0.55		0.20	0.9	B	2.2	4.3		2.2	3360	U	3360	10100	U	10100
OB-6	J19YF9	5/13/10	1.25		0.21	3.4		2.3	14.2		2.3	3330	U	3330	5970	J	10000
OB-7	J19YH0	5/13/10	1.3		0.18	2.2	B	2.5	8.8		2.5	3300	U	3300	9900	U	9900
OB-8	J19YH1	5/13/10	1.28		0.19	2.6		2.3	6.7		2.3	4770		3360	8510	J	10100
OB-8 re-sample 1	J1FKL6	3/17/11	0.79	B	0.38	1.3	U	1.3	6.9		1.8	3200	J	720			
OB-9	J19YH2	5/13/10	0.66		0.19	2.4	U	2.4	3.0		2.4	3340	U	3340	10000	U	10000
OB-10	J19YH3	5/13/10	2.49		0.19	1.3	B	2.4	7.7		2.4	3340	U	3340	10000	U	10000
OB-11	J19YH4	5/13/10	0.99		0.18	3.9		2.5	7.4		2.5	3340	U	3340	15000		10000
OB-12	J19YH5	5/13/10	0.95		0.22	2.4		2.4	3.8		2.4	3340	U	3340	10000	U	10000
OB-13	J1B4H9	5/17/10	4.61		0.20	4.4		2.3	6.4		2.3	3360	U	3360	11500		10100
OB-14	J1B4J0	5/17/10	3.01		0.20	4.3		2.3	5.4		2.3	3310	U	3310	6810	J	9930
OB-15	J1B4J1	5/17/10	2.85		0.19	2.7		2.2	8.0		2.2	3340	U	3340	8950	J	10000
SPA-4	J19YJ0	5/17/10	0.11		0.20	7.2		2.3	3.3		2.3	3300	U	3300	8660	J	9920
SPA-4 re-sample 1	J1FKM0	3/17/11	0.36	U	0.36	1.2	U	1.2	1.7	B	1.7	6900		690			
Duplicate of J1FKM0	J1FKM9	3/17/11	0.37	U	0.37	1.3	U	1.3	1.9	B	1.8	2200	J	690			
SPA-1	J19YH7	5/17/10	1.04		0.20	1.4	B	2.4	2.7		2.4	3300	U	3300	184000		9910
SPA-1 re-sample 1	J1FKL7	3/17/11	0.35	U	0.35	2.5	B	1.2	2.1	B	1.7	690	U	690			
SPA-2	J19YH8	5/17/10	0.20		0.20	4.9		2.3	2.7		2.3	3260	U	3260	17400		9800
SPA-2 re-sample 1	J1FKL8	3/17/11	0.37	U	0.37	1.2	U	1.2	1.7	U	1.7	640	U	640			
SPA-3	J19YH9	5/17/10	0.18		0.19	6.9		2.5	1.7	B	2.5	3350	U	3350	10400		10100
SPA-3 re-sample 1	J1FKL9	3/17/11	0.37	U	0.37	1.3	U	1.3	2.0	B	1.8	690	U	690			
SPA-5	J19YJ1	5/17/10	0.17		0.21	2.0	B	2.3	1.8	B	2.3	3330	U	3330	14900		9990
SPA-5 re-sample 1	J1FKM1	3/17/11	39.9		0.37	1.3	B	1.3	43.6		1.8	11000		710			
SPA-6	J19YJ2	5/17/10	0.60		0.21	17.8		2.4	6.6		2.4	3360	U	3360	141000		10100
SPA-6 re-sample 1	J1FKM2	3/17/11	50.9		0.36	1.9	B	1.3	18.2		1.9	8500		720			
SPA-7	J19YJ3	5/17/10	0.41		0.20	3.4		2.2	2.6		2.2	3320	U	3320	10500		9970
SPA-7 re-sample 1	J1FKM3	3/17/11	0.43	B	0.38	1.7	B	1.3	2.0	B	1.8	9500		720			
SPA-8	J19YJ4	5/17/10	0.48		0.20	12.1		2.4	3.4		2.4	3360	U	3360	40800		10100
SPA-8 re-sample 1	J1FKM4	3/17/11	0.85		0.38	1.3	U	1.3	55.6		1.8	7100		690			
SPA-9	J19YJ5	5/17/10	1.34		0.21	9.6		2.4	3.2		2.4	3350	U	3350	60800		10100
SPA-9 re-sample 1	J1FKM5	3/17/11	0.46	B	0.40	1.8	B	1.4	2.8	B	1.9	4400		740			
SPA-10	J19YJ6	5/17/10	0.26		0.22	8.6		2.4	2.0	B	2.4	3350	U	3350	58900		10000
SPA-10 re-sample 1	J1FKM6	3/17/11	0.36	U	0.36	1.2	U	1.2	5.4		1.7	820	J	690			
SPA-11	J19YJ7	5/17/10	4.01		0.20	9.8		2.4	4.6		2.4	3310	U	3310	39100		9930
SPA-11 re-sample 1	J1FKM7	3/17/11	1.1		0.36	1.3	U	1.3	9.1		1.8	690	U	690			
SPA-12	J19YJ8	5/17/10	1.26		0.20	12.8		2.4	10		2.4	3350	U	3350	53900		10000
SPA-12 re-sample 1	J1FKM8	3/17/11	0.62	B	0.38	1.7	B	1.3	3.3	B	1.8	4000	J	700			
Duplicate of J19YJ4	J19YJ9	5/17/10	0.47		0.21	14.8		2.2	3.2		2.2	3360	U	3360	64900		10100
Equipment Blank	J19YK0	5/17/10															

Attachment	1	Sheet No.	77 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	TPH diesel range EXT			Percent Solids			pH Measurement		
			ug/kg	Q	PQL	%	Q	PQL	pH unit	Q	PQL
OB-5	J19YF8	5/13/10				99.2		0.1			
Duplicate of J19YF8	J19YH6	5/13/10				99.2		0.1			
OB-1	J19YF4	5/13/10				98.9		0.1			
OB-2	J19YF5	5/13/10				99.7		0.1			
OB-3	J19YF6	5/13/10				99.3		0.1			
OB-4	J19YF7	5/13/10				99.2		0.1			
OB-6	J19YF9	5/13/10				99.3		0.1			
OB-7	J19YH0	5/13/10				99.2		0.1			
OB-8	J19YH1	5/13/10				99.0		0.1			
OB-8 re-sample 1	J1FKL6	3/17/11	6500		1100				9.48		0.01
OB-9	J19YH2	5/13/10				99.5		0.1			
OB-10	J19YH3	5/13/10				99.3		0.1			
OB-11	J19YH4	5/13/10				99.2		0.1			
OB-12	J19YH5	5/13/10				99.1		0.1			
OB-13	J1B4H9	5/17/10				99.6		0.1			
OB-14	J1B4J0	5/17/10				99.7		0.1			
OB-15	J1B4J1	5/17/10				99.5		0.1			
SPA-4	J19YJ0	5/17/10				99.5		0.1			
SPA-4 re-sample 1	J1FKM0	3/17/11	15000		1000				9.6		0.01
Duplicate of J1FKM0	J1FKM9	3/17/11	5700		1000				9.55		0.01
SPA-1	J19YH7	5/17/10				99.7		0.1			
SPA-1 re-sample 1	J1FKL7	3/17/11	1000	U	1000				9.58		0.01
SPA-2	J19YH8	5/17/10				99.6		0.1			
SPA-2 re-sample 1	J1FKL8	3/17/11	940	U	940				9.44		0.01
SPA-3	J19YH9	5/17/10				99.4		0.1			
SPA-3 re-sample 1	J1FKL9	3/17/11	1000	U	1000				9.66		0.01
SPA-5	J19YJ1	5/17/10				99.6		0.1			
SPA-5 re-sample 1	J1FKM1	3/17/11	41000		1000				8.87		0.01
SPA-6	J19YJ2	5/17/10				99.1		0.1			
SPA-6 re-sample 1	J1FKM2	3/17/11	30000		1100				8.82		0.01
SPA-7	J19YJ3	5/17/10				99.7		0.1			
SPA-7 re-sample 1	J1FKM3	3/17/11	35000		1100				9.17		0.01
SPA-8	J19YJ4	5/17/10				99.2		0.1			
SPA-8 re-sample 1	J1FKM4	3/17/11	12000		1000				9.26		0.01
SPA-9	J19YJ5	5/17/10				99.5		0.1			
SPA-9 re-sample 1	J1FKM5	3/17/11	7700		1100				9.09		0.01
SPA-10	J19YJ6	5/17/10				99.4		0.1			
SPA-10 re-sample 1	J1FKM6	3/17/11	2100	J	1000				9.45		0.01
SPA-11	J19YJ7	5/17/10				99.0		0.1			
SPA-11 re-sample 1	J1FKM7	3/17/11	1000	U	1000				9.42		0.01
SPA-12	J19YJ8	5/17/10				99.5		0.1			
SPA-12 re-sample 1	J1FKM8	3/17/11	8800		1000				9.31		0.01
Duplicate of J19YJ4	J19YJ9	5/17/10				99.2		0.1			
Equipment Blank	J19YK0	5/17/10				99.0		0.1			

Attachment	1	Sheet No.	78 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Percent moisture (wet sample)		
			%	Q	PQL
DZ-1 re-sample 1	J1FKK1	3/16/11	7.0		0
DZ-2 re-sample 1	J1FKK2	3/16/11	6.8		0
DZ-3 re-sample 1	J1FKK3	3/16/11	17.9		0
DZ-4 re-sample 1	J1FKK4	3/16/11	4.4		0
DZ-5 re-sample 1	J1FKK5	3/16/11	5.2		0
DZ-6 re-sample 1	J1FKK6	3/16/11	3.8		0
DZ-7 re-sample 1	J1FKK7	3/16/11	8.2		0
DZ-8 re-sample 1	J1FKK8	3/16/11	5.7		0
DZ-9 re-sample 1	J1FKK9	3/16/11	3.0		0
DZ-10 re-sample 1	J1FKL0	3/16/11	4.7		0
DZ-11 re-sample 1	J1FKL1	3/16/11	9.0		0
DZ-12 re-sample 1	J1FKL2	3/16/11	6.8		0
Duplicate of J1FKK8	J1FKL3	3/16/11	6.9		0
SZ-9 re-sample 1	J1FKL4	3/16/11	6.5		0
SZ-11 re-sample 1	J1FKL5	3/16/11	3.9		0
OB-8 re-sample 1	J1FKL6	3/17/11	6.3		0
SPA-1 re-sample 1	J1FKL7	3/17/11	3.6		0
SPA-2 re-sample 1	J1FKL8	3/17/11	2.8		0
SPA-3 re-sample 1	J1FKL9	3/17/11	3.9		0
SPA-4 re-sample 1	J1FKM0	3/17/11	3.8		0
SPA-5 re-sample 1	J1FKM1	3/17/11	4.8		0
SPA-6 re-sample 1	J1FKM2	3/17/11	7.2		0
SPA-7 re-sample 1	J1FKM3	3/17/11	7.1		0
SPA-8 re-sample 1	J1FKM4	3/17/11	6.4		0
SPA-9 re-sample 1	J1FKM5	3/17/11	9.8		0
SPA-10 re-sample 1	J1FKM6	3/17/11	3.1		0
SPA-11 re-sample 1	J1FKM7	3/17/11	2.6		0
SPA-12 re-sample 1	J1FKM8	3/17/11	5.9		0
Duplicate of J1FKM0	J1FKM9	3/17/11	3.9		0
Equipment Blank	J1FKN0	3/17/11	0.12		0
DZ-1 re-sample 2	J1HH80	4/13/11	7.0		0
DZ-2 re-sample 2	J1HH81	4/13/11	3.5		0
DZ-3 re-sample 2	J1HH82	4/13/11	1.6		0
DZ-4 re-sample 2	J1HH83	4/13/11	2.7		0
DZ-7 re-sample 2	J1HH84	4/13/11	13.2		0
DZ-8 re-sample 2	J1HH85	4/13/11	3.1		0
Duplicate of J1HH85	J1HH86	4/13/11	3.0		0
Equipment Blank	J1HH87	4/13/11	0.1	U	0

Attachment	1	Sheet No.	79 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental Calculation No: 0100H-CA-V0165

Subject: 116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 4 Total = 5	J. D. Skoglie	T. E. Queen	B. L. Vedder	D. F. Obenauer D. F. Obenauer	6/22/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007)

DE01-437.03

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/17/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/17/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 116-H-5 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009a), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2009a, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2009b, *100 Area Remedial Action Sampling and Analysis Plan*, DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

4) WCH, 2011, *Remaining Sites Verification Package for the 116-H-5, 1904-H Outfall Structure*, Attachment to Waste Site Reclassification Form 2011-012, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the individual HQ of <1.0 (DOE-RL 2009a).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the excess cancer risk of $<1 \times 10^{-6}$ (DOE-RL 2009a).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/18/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/18/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 4	

METHODOLOGY:

The 116-H-5 waste site is comprised of four decision units for verification sampling, consisting of the shallow zone, deep zone, overburden, and staging pile area. The direct contact hazard quotient and carcinogenic risk calculations for the 116-H-5 waste site were conservatively calculated for the shallow zone, overburden, and staging pile area using the statistical verification soil sample results (WCH 2011). Of the contaminants of potential concern (COPCs) for this site nitrogen in nitrate and nitrite required an HQ and risk calculation because this analyte was detected above the background value. Boron, hexavalent chromium, molybdenum, bis(2-ethylhexyl)phthalate, the detected polycyclic aromatic hydrocarbons, pesticides, and polychlorinated biphenyls require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Although total petroleum hydrocarbons (diesel range extended) were detected and no background value is available, the risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation. Lead was detected above background; however, lead does not have a reference dose for calculation of a hazard quotient because toxic effects of lead are correlated with blood-lead levels rather than exposure levels or daily intake. Additionally, arsenic was detected above background; however, the arsenic standard is not toxicity based. All other site nonradionuclide COPCs were not detected or were quantified below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the maximum value for boron is 2.4 mg/kg, divided by the noncarcinogenic RAG value of 7,200 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is 3.3×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation. The sum of the HQ values is 1.2×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1.0×10^{-6}. For example, the maximum value for hexavalent chromium is 0.16 mg/kg, divided by 2.1 mg/kg, and multiplied as indicated, is 7.6×10^{-8}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual cancer risk values prior to rounding are used for this calculation. The sum of the excess cancer risk values is 1.0×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/18/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/18/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 4	

4) List the cumulative excess cancer risk for carcinogens >1 x 10^{-5}: None

Table 1 (2 pages) shows the results of the hazard quotient and excess cancer risk calculations.

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 116-H-5 Waste Site (2 pages).

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Arsenic[c]	14.0	20	--	--	--
Boron	2.4	7,200	3.3E-04	--	--
Chromium, hexavalent[d]	0.16	240	6.7E-04	2.1	7.6E-08
Lead[c]	33.4	353	--	--	--
Molybdenum	0.33	400	8.3E-04	--	--
Anions					
Nitrogen in nitrate and nitrite	16.0	128,000	1.3E-04	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.121	1,600	7.6E-05	71.4	1.7E-09
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.0219	4,800	4.6E-06	--	--
Acenaphthylene[f]	0.027	4,800	5.6E-06	--	--
Anthracene	0.087	24,000	3.6E-06	--	--
Benzo(a)anthracene	0.0785	--	--	1.37	5.7E-08
Benzo(a)pyrene	0.0885	--	--	0.137	6.5E-07
Benzo(b)fluoranthene	0.105	--	--	1.37	7.7E-08
Benzo(ghi)perylene[f]	0.096	2,400	4.0E-05	--	--
Benzo(k)fluoranthene	0.023	--	--	1.37	1.7E-08
Chrysene	0.113	--	--	13.7	8.2E-09
Dibenz(a,h)anthracene	0.026	--	--	1.37	1.9E-08
Fluoranthene	0.400	3,200	1.3E-04	--	--
Fluorene	0.057	3,200	1.8E-05	--	--
Indeno(1,2,3-cd)pyrene	0.0834	--	--	1.37	6.1E-08
Naphthalene	0.0251	1,600	1.6E-05	--	--
Phenanthrene[f]	0.107	24,000	4.5E-06	--	--
Pyrene	0.342	2,400	1.4E-04	--	--
Pesticides					
DDE, 4,4'-	0.040	--	--	2.94	1.4E-08
DDT, 4,4'-	0.0053	40	1.3E-04	2.94	1.8E-09

Washington Closure Hanford Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/17/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/17/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 4 of 4	

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 116-H-5 Waste Site (2 pages).

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Aroclor-1254	0.015	1.6	9.4E-03	0.5	3.0E-08
Aroclor-1260	0.010	--	--	0.5	2.0E-08
Total Petroleum Hydrocarbons					
Diesel Range Extended[g]	19.4	200	--	--	--
Motor oil (high boiling)[g]	147	200	--	--	--
Totals					
Cumulative Hazard Quotient:			**1.2E-02**		
Cumulative Excess Cancer Risk:					**1.0E-06**

[a] = From WCH (2011).

[b] = Value obtained from the RDR/RAWP (DOE-RL 2009a) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009a).

[d] = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.

[e] = Value for the noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[f] = Toxicity data for acenaphthylene, benzo(ghi)perylene, and phenanthrene are not available. The cleanup level is based on use of
acenaphthylene surrogate: acenaphthene
benzo(ghi)perylene surrogate: pyrene
phenanthrene surrogate: anthracene

[g] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

-- = not applicable RAG = remedial action goal

CONCLUSION:

The calculations in Table 1 demonstrates that the 116-H-5 waste site meets the requirements for the direct contact hazard quotients and carcinogenic (excess cancer) risk, respectively, as identified in the RDR/RAWP (DOE-RL 2009a) and SAP (DOE-RL 2009b). The direct contact hazard quotients and carcinogenic (excess cancer) risk calculations are for use in the RSVP for this site.

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Area Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0166

Subject: 116-H-5 Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 4 Total = 5	C. H. Dobie CH Dobie	T. E. Queen TE Queen	B. L. Vedder BL Vedder	D. F. Obenauer D. F. Obenauer	6/22/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie	Date:	6/1/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	6/1/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and excess carcinogenic risk associated with soil contaminant levels compared to soil cleanup levels for protection of groundwater for the 116-H-5 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens.
2) A cumulative HQ of <1.0 for noncarcinogens.
3) An excess cancer risk of <1 x 10^{-6} for individual carcinogens.
4) A cumulative excess cancer risk of <1 x 10^{-5} for carcinogens.

GIVEN/REFERENCES:

1) BHI, 2005, *100 Area Analogous Sites RESRAD Evaluation*, Calculation No. 0100X-CA-V0050 Rev 0, Bechtel Hanford, Inc., Richland, Washington.

2) DOE-RL, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

4) WCH, 2011, *116-H-5 Waste Site Cleanup Verification 95% UCL Calculations*, 0100H-CA-V0164, Rev. 0, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate a HQ for each noncarcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (BHI 2005).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (BHI 2005).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of <1 x 10^{-5}.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie	Date:	6/1/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	6/1/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 2 of 4	

METHODOLOGY:

The 116-H-5 waste site was divided into four decision units for the purpose of verification sampling; the deep zone excavation, the shallow zone excavation, the staging pile footprint, and the overburden soil stockpile. Hazard quotient and carcinogenic risk calculations for potential impact to groundwater at the 116-H-5 waste site were conservatively calculated for the entire waste site using the statistical or maximum value for each analyte in all decision units from the 95% UCL calculation (WCH 2011). Boron, hexavalent chromium, molybdenum, nitrogen in nitrate, nitrogen in nitrite, acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene, and 4,4'-DDD are included because they do not have a Hanford Site-specific or Washington State background value available and their respective distribution coefficient is less than necessary to show no migration to groundwater in 1,000 years using the generic site RESRAD model (BHI 2005). Based on this model and a vadose zone of approximately 0.0 m (0.0 ft) thickness, a K_d value of 80 mL/g is adequate to show no predicted risk to groundwater in 1,000 years. Contaminants with a K_d of 80 mL/g are highly adsorbed to soil particles, and even when immersed in water, any migration will be negligible. Therefore, HQ and risk calculations were performed with the exclusion of these analytes with a K_d over 80 mL/g. Aroclor-1254 is included in the calculation because its K_d (75.6) does not allow for the exclusion from this site. However, the single detection of aroclor-1254 was in the staging pile area, where only a K_d of 7.2 is required to show protection of groundwater. Therefore, aroclor-1254 is included for completeness, but is not necessary to calculate the groundwater HQ. All other site nonradionuclide COPCs were not detected, or quantified below background levels. Additionally, arsenic, lead, TPH-diesel range, TPH-diesel range EXT, and TPH-motor oil (high boiling) were detected above background; however, the standard for each contaminant is not toxicity based, therefore a groundwater HQ is not calculated. An example of the HQ and risk calculations for soil constituents with a potential impact to groundwater is presented below:

1) The hazard quotient is defined as the ratio of the dose of a substance obtained over a specified time (mg/kg/day) to a reference dose for the same substance derived over the same specified time (mg/kg/day). The hazard quotient can also be calculated as the ratio of the concentration in soil (maximum or statistical value) (mg/kg) to the soil RAG (mg/kg) for protection of groundwater, where the RAG is the groundwater cleanup level (mg/L) (calculated with, and related to the hazard quotient through, WAC 173-340-720(3)(a)(ii)(A), 1996) x 100 x 1 mg/1000 mg (conversion factor)). This is based on the "100 times rule" of WAC 173-340-740(3)(a)(ii)(A) (1996). For example, the maximum value for boron of 2.4 mg/kg, divided by the noncarcinogenic RAG value of 320 mg/kg is 7.5×10^{-3}. Comparing this value to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation.) The cumulative HQ for the 116-H-5 waste site is 6.5×10^{-1}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, and then multiplied by 1×10^{-6}. For example, the maximum value for 4,4'-DDD is 0.00212 mg/kg, divided by 0.0365 mg/kg, and multiplied as indicated, is 5.8×10^{-8}. Comparing this value to the requirement of $<1 \times 10^{-6}$, this criterion is met. Aroclor-1254 exceeded the individual carcinogenic risk value. This value is based on only one detected result located in the staging pile

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie	Date:	6/1/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	6/1/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 3 of 4	

area. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009), the residual concentration of aroclor-1254 is not expected to migrate more than 0.25 m (0.825 ft) vertically in 1,000 years (based on the distribution coefficient of 75.6 mL/g). The vadose zone underlying the soil below the staging pile area is approximately 10.0 m (33.0 ft) thick. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River. The cumulative excess cancer risk for the 116-H-5 waste site is 5.8×10^{-8}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

4) The soil cleanup RAGs for protection of groundwater are based on the "100 times" provision in WAC 173-340-740(3)(a)(ii)(A). WAC 173-340-740(3)(a)(ii)(A) (1996) provides the "100 times rule" but also states "unless it can be demonstrated that a higher soil concentration is protective of ground water at the site." When the "100 times rule" values are exceeded, RESRAD was used to demonstrate that higher soil concentrations may be protective of groundwater.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None.
2) List the cumulative noncarcinogenic HQ >1.0: None.
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None.
4) List the cumulative excess cancer risk for carcinogens $>1 \times 10^{-5}$: None.

Table 1 shows the results of the calculations.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie CHD	Date:	6/2/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen TEQ	Date:	6/2/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 4 of 4	

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 116-H-5 Waste Site.

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Arsenic	14.0	20 [c]	--	--	--
Boron	2.4	320	7.5E-03	--	--
Chromium, hexavalent	0.16	4.8	3.3E-02	--	--
Lead [d]	33.4	353	--	--	--
Molybdenum	0.87	8	1.1E-01	--	--
Inorganic Anions and TPH					
Nitrogen in Nitrate	34.0	2,560	1.3E-02	--	--
Nitrogen in Nitrite	0.40	160	2.5E-03	--	--
TPH - diesel range EXT	19.4	200 [e]	--	--	--
TPH - motor oil (high boiling)	147	200 [e]	--	--	--
Semivolatiles					
Acenaphthene	0.0219	96	2.3E-04	--	--
Acenaphthylene [f]	0.027	96	2.8E-04	--	--
Anthracene	0.087	240	3.6E-04	--	--
Fluoranthene	0.400	64	6.3E-03	--	--
Fluorene	0.057	64	8.9E-04	--	--
Naphthalene	0.0251	16	1.6E-03	--	--
Phenanthrene [f]	0.107	240	4.5E-04	--	--
Pyrene	0.342	48	7.1E-03	--	--
Pesticides					
DDD, 4,4'-	0.00212	--	--	0.0365	5.8E-08
Polychlorinated Biphenyls					
Aroclor-1254 [g]	0.015	0.032	4.7E-01	0.00438	3.4E-06
Totals					
Cumulative Hazard Quotient:			**6.5E-01**		
Cumulative Excess Cancer Risk:					**5.8E-08**

Notes:

[a] = From WCH (2011).

[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the "100 times" model.

[c] = The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009). The arsenic standard is not toxicity based, therefore, will not have a hazard quotient calculated.

[d] = Value for noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[e] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

[f] = Toxicity data for these chemicals are not available. Cleanup levels are based on surrogate chemicals:

Contaminant: acenapthylene; surrogate: acenapthene

Contaminant: phenathrene; surrogate: anthracene

[g] = Aroclor-1254 was only detected in one location in the staging pile area. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009), the residual concentration of aroclor-1254 is not expected to migrate more than 0.25 m (0.825 ft) vertically in 1,000 years (based on the distribution coefficient of 75.6 mL/g). The vadose zone underlying the soil below the staging pile area is approximately 10.0 m (33.0 ft) thick. Therefore, the residual concentration of this constituent is predicted to be protective of groundwater and the Columbia River, and is not considered a carcinogenic risk to groundwater.

-- = not applicable

RAG = remedial action goal

CONCLUSION:

This calculation demonstrates that the 116-H-5 waste site meets the requirements for the hazard quotients and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2009).

Date Submitted: 7/11/2011 Originator: M. L. Proctor Phone: 372-9227	**WASTE SITE RECLASSIFICATION FORM** Operable Unit(s): 100-HR-1 Waste Site Code: 116-H-5 Type of Reclassification Action: Closed Out ☐ Interim Closed Out ☒ No Action ☐ RCRA Postclosure ☐ Rejected ☐ Consolidated ☐	Control Number: 2011-012

This form documents agreement among parties listed authorizing classification of the subject unit as Closed Out, Interim Closed Out, No Action, RCRA Postclosure, Rejected, or Consolidated. This form also authorizes backfill of the waste management unit, if appropriate, for Closed Out and Interim Closed Out units. Final removal from the NPL of No Action and Closed Out waste management units will occur at a future date.

Description of current waste site condition:

The 116-H-5, 1904-H Outfall Structure was a liquid waste site that operated from 1949 to 1965 as a weir box to discharge 105-H Reactor coolant water and process sewer waste to the Columbia River, and to provide overflow capability in case the outfall discharge pipelines became plugged or received too much flow. The 116-H-5 outfall received effluent via the 100-H-21, 100-H Reactor Cooling Water Effluent Underground Pipelines from the 116-H-7, 107-H Retention Basin and the 100-H-42 process sewer pipelines from the 1906-H Drainage Lift Station.

Remediation, verification sampling, and comparison of residual contaminant concentrations against cleanup levels have been performed in accordance with remedial action objectives (RAOs) and remedial action goals (RAGs) established by the *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland, Washington and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington. The selected remedy involved, (1) excavating the site to the extent required to meet specified soil cleanup levels, (2) disposing of contaminated excavation materials at the Environmental Restoration Disposal Facility at the 200 Area of the Hanford Site, (3) demonstrating through verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification as Interim Closed Out.

Basis for reclassification:

The verification sampling and/or modeling results for the 116-H-5, 1904-H Outfall Structure demonstrate that this site meets the RAOs and corresponding RAGs established in the Remaining Sites ROD. The sample and modeling results demonstrate that residual contaminant concentrations do not preclude any future land uses (as bounded by a rural-residential scenario), and allow for unrestricted future use of shallow-zone soils (i.e., surface to 4.6 m [15 ft]). The sample and modeling results also show that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the, 116-H-5, 1904-H Outfall Structure* (attached).

Regulator Comments:
Approval of this WSRF documents regulator agreement that the 116-H-5 waste site qualifies for "Interim Closed Out" under this Interim Action ROD. In addition, Ecology has evaluated the data for this site against WAC 173-340 (2007) clean-up levels for direct contact, groundwater protection, and river protection. This evaluation is documented in the letter transmitting Ecology's approval of the site's interim reclassification to "Interim Closed Out."

Waste Site Controls:

Engineered Controls: Yes ☐ No ☒ Institutional Controls: Yes ☒ No ☐ O&M requirements: Yes ☐ No ☒
If any of the Waste Site Controls are checked Yes specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents.

M. S. French DOE Federal Project Director (printed)	MSFrench Signature	12/20/11 Date
N. Menard Ecology Project Manager (printed)	Signature	Date
N/A EPA Project Manager (printed)	Signature	Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 116-H-5, 1904-H OUTFALL STRUCTURE

Attachment to Waste Site Reclassification Form 2011-012

June 2011

REMAINING SITES VERIFICATION PACKAGE FOR THE 116-H-5, 1904-H OUTFALL STRUCTURE

EXECUTIVE SUMMARY

The 116-H-5, 1904-H Outfall Structure, part of the 100-HR-1 Operable Unit, was a liquid waste site that operated from 1949 to 1965, as a weir box to discharge 105-H Reactor coolant water and process sewer waste to the Columbia River, and to provide overflow capability in case the outfall discharge pipelines became plugged or received too much flow. The 116-H-5 outfall received effluent via the 100-H-21, 100-H Reactor Cooling Water Effluent Underground Pipelines from the 116-H-7, 107-H Retention Basin and the 100-H-42 process sewer pipelines from the 1906-H Drainage Lift Station. Water flowed from the outfall structure and discharged to the Columbia River via the 100-H-34, 100-H River Effluent Pipelines. In the event that the river effluent pipelines became plugged or received too much flow, effluent would back up into the outfall structure and overflow into the 100-H-36 underground concrete spillway that discharged directly to the river (BHI 1995).

Remedial action at the 116-H-5 waste site began on November 17, 2008, and continued through April 9, 2009, to a depth of approximately 7 m (23 ft) on the eastern side of the excavation and 13 m (43 ft) on the western side of the excavation. The excavation resulted in approximately 2,510 bank cubic meters (BCM) (3,283 bank cubic yards [BCY]) of contaminated soil and debris being removed for disposal at the Environmental Restoration Disposal Facility (ERDF). Approximately 15,696 BCM (20,529 BCY) of overburden material was stockpiled southwest of the excavation for use as clean backfill. Columnar basalt riprap boulders, cemented together and used as a retaining wall, were also excavated from the site and will be used as backfill. Most of the soil was direct loaded from the excavation; however, small staging pile areas were used for pipe, concrete, and fence material, which were later loaded out and disposed at the ERDF.

Several pipelines that discharged to or from the 116-H-5, 1904-H Outfall Structure remain at the site. A 183-cm (72-in.) reinforced concrete pipe (part of the 100-H-42, 1906-H Drainage Lift Station waste site that transferred effluent from the 1906-H Building to the 116-H-5 outfall) remains near the base of the western sidewall of the 116-H-5 excavation. The 100-H-36 spillway and the 100-H-34, 100-H River Effluent Pipelines that discharged effluent from the outfall structure to the river also remain.

Following site remediation, verification sampling was conducted May 13 through 18, 2010. The results of the verification sampling indicated that some sample locations in every decision unit had results that exceeded the cleanup criteria. As a result, additional excavation was performed to remove contaminated soils. Additional samples were subsequently collected on March 16, 2011 from the original failed locations except for the staging pile area, which had a new sample design implemented because the original boundary had been altered during the additional remediation. These samples showed exceedances in the deep zone decision unit and additional remediation was again conducted for the deep zone locations that exceeded cleanup criteria. Following this third remediation campaign, verification sampling of the failed locations was conducted on April 13, 2011. The results indicate that remedial action objectives (RAOs) and remedial action goals (RAGs) for direct exposure, protection of groundwater, and protection of the Columbia River have been met.

A summary of the cleanup evaluation for the soil results against the applicable criteria is presented in Table ES-1. The results of the verification sampling and modeling are used to make a reclassification decision for the 116-H-5 waste site in accordance with the TPA-MP-14 procedure in the *Tri-Party Agreement Handbook Management Procedures* (DOE-RL 2007).

Table ES-1. Summary of Remedial Action Goals for the 116-H-5 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain dose rate of <15-mrem/yr dose rate above background over 1,000 years.	Maximum dose rates from sum of fractions evaluations for the excavation using individual radionuclide dose-equivalent lookup values are <15 mrem/yr. The maximum predicted cumulative dose rate for the excavation is 4.88 mrem/yr.	Yes
Direct Exposure – Nonradionuclides	Attain individual COPC RAGs.	All individual COC/COPC concentrations are below the direct exposure criteria.	Yes
Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	The hazard quotients for individual nonradionuclide COCs/COPCs are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotient (1.2×10^{-2}) is <1.	
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	The excess cancer risk for carcinogens is $<1 \times 10^{-6}$.	
	Attain a cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The total excess cancer risk (1.0×10^{-6}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single COPC groundwater and river protection RAGs.	The residual concentration of technetium-99 exceeded the soil RAGs for the protection of groundwater and/or the Columbia River. However, site-specific RESRAD modeling predicts that residual concentrations of this constituent will be protective of groundwater and the river [a].	Yes
	Attain national primary drinking water regulations [b]: 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.	Only technetium-99 was quantified above groundwater/river protection soil lookup values. Site-specific RESRAD modeling predicts that residual concentrations of this constituent will attain national primary drinking water regulations.	
	Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide from DOE Order 5400.5 [c].	Activity of alpha-emitting radionuclide COPCs detected above background is less than lookup values.	
	Meet total uranium standard of 30 µg/L (21.2 pCi/L) [d].	Uranium was not quantified above background levels for this site.	

Table ES-1. Summary of Remedial Action Goals for the 116-H-5 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	Residual concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, 4,4'-DDE, 4,4'-DDT, and total PCBs exceeded the soil RAGs for the protection of groundwater and/or the Columbia River. However, RESRAD modeling and site-specific soil screening modeling predicts that residual concentrations of these constituents will be protective of groundwater and the river [e, f, g].	Yes

[a] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b) and an evaluation of dilution attenuation in the saturated zone using the formulas from the EPA *Soil Screening Guidance: User's Guide* (EPA 1996), residual soil concentrations of technetium-99 are predicted to be protective of groundwater and the Columbia River for 1,000 years (Appendix C).

[b] "National Primary Drinking Water Regulations" (40 CFR 141).

[c] *Radiation Protection of the Public and the Environment* (DOE Order 5400.5).

[d] Based on the isotopic distribution of uranium in the Hanford Site background, the 30 μg/L uranium MCL (40 CFR 141.66) corresponds to 21.2 pCi/L. Concentration-to-activity calculations are documented in *Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater* (BHI 2001a).

[e] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, 4,4'-DDE, 4,4'-DDT, and total PCBs in the shallow-zone excavation, overburden soil stockpile, and waste staging pile area footprint are not expected to migrate more than 1.8 m (6.0 ft) vertically in 1,000 years (based on the contaminant with the lowest distribution coefficient of 30 mL/g for lead). The vadose zone underlying the soil below the shallow zone decision unit is approximately 7.0 m (23.0 ft) in depth. The vadose zone underlying the final placement location of the overburden soil stockpile decision unit is at least 2.0 m (6.6 ft) in depth. The vadose zone underlying the staging pile area decision unit is approximately 11.0 m (36.0 ft) in depth. The vaodse zone underlying the deep zone decision unit is 0.0 m (0.0 ft) in depth because portions of the deep zone excavation had groundwater intrusion at times of high river flows. Predicted concentrations in groundwater due to partitioning of residual concentrations of lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(k)fluoranthene between soil and groundwater are all less than the most restrictive groundwater cleanup levels. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River.

[f] Based on the EPA soil screening equation for migration to groundwater (EPA 1996), the predicted concentrations in groundwater due to partitioning of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene between soil and groundwater within the deep zone decision unit are all less than the most restrictive groundwater cleanup levels. As a result, the residual concentrations of these compounds are predicted to be protective of groundwater and the Columbia River.

[g] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b) and an evaluation of dilution attenuation in the saturated zone using the formulas from the EPA *Soil Screening Guidance: User's Guide* (EPA 1996), residual soil concentrations of lead are predicted to be protective of groundwater and the Columbia River for 1,000 years (Appendix C).

COC = contaminant of concern
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
DOE = U.S. Department of Energy
EPA = U.S. Environmental Protection Agency
MCL = maximum contaminant level
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan of the 100 Area*
RESRAD = RESidual RADioactivity (dose model)
UCL = upper confidence limit

In accordance with this evaluation, the verification sampling and modeling results support a reclassification of this site to Interim Closed Out. The current site conditions achieve the RAOs and the corresponding RAGs established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2009b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 116-H-5 waste site contaminants of potential concern and other constituents. The U.S. Environmental Protection Agency ecological soil screening levels were exceeded for antimony, lead, manganese, vanadium, zinc, and DDT/DDD/DDE (total). Ecological screening levels from *Washington Administrative Code* 173-340 were exceeded for arsenic, boron, and vanadium. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of antimony, manganese, vanadium, and zinc are below Hanford Site or Washington State background values (note that state background values are only used when Hanford Site background values are not available), it is believed that the presence of these constituents does not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

REMAINING SITES VERIFICATION PACKAGE FOR THE 116-H-5, 1904-H OUTFALL STRUCTURE

STATEMENT OF PROTECTIVENESS

This report demonstrates that the 116-H-5, 1904-H Outfall Structure waste site meets the objectives for Interim Closed Out as established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2009b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999). The verification sample and modeling results show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow-zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 116-H-5 waste site contaminants of potential concern and other constituents (Appendix A). The U.S. Environmental Protection Agency (EPA) ecological soil screening levels were exceeded for antimony, lead, manganese, vanadium, zinc, and DDT/DDD/DDE (total). Ecological screening levels from *Washington Administrative Code* 173-340 were exceeded for arsenic, boron, and vanadium. Exceeding screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of antimony, manganese, vanadium, and zinc are below Hanford Site or Washington State background values (note that state background values are only used when Hanford Site background values are not available), it is believed that the presence of these constituents does not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

GENERAL SITE INFORMATION AND BACKGROUND

The 116-H-5, 1904-H Outfall Structure, part of the 100-HR-1 Operable Unit, was located northeast of the 105-H Reactor Building and north of the 116-H-7, 107-H Retention Basin on the Columbia River shoreline (Figure 1). The slope between the outfall and the riverbank was covered with large basalt riprap boulders that were mortared in place, extending about 73 m (240 ft) north and south of the outfall structure (Figure 2).

Figure 1. The 116-H-5 Waste Site Location Map.

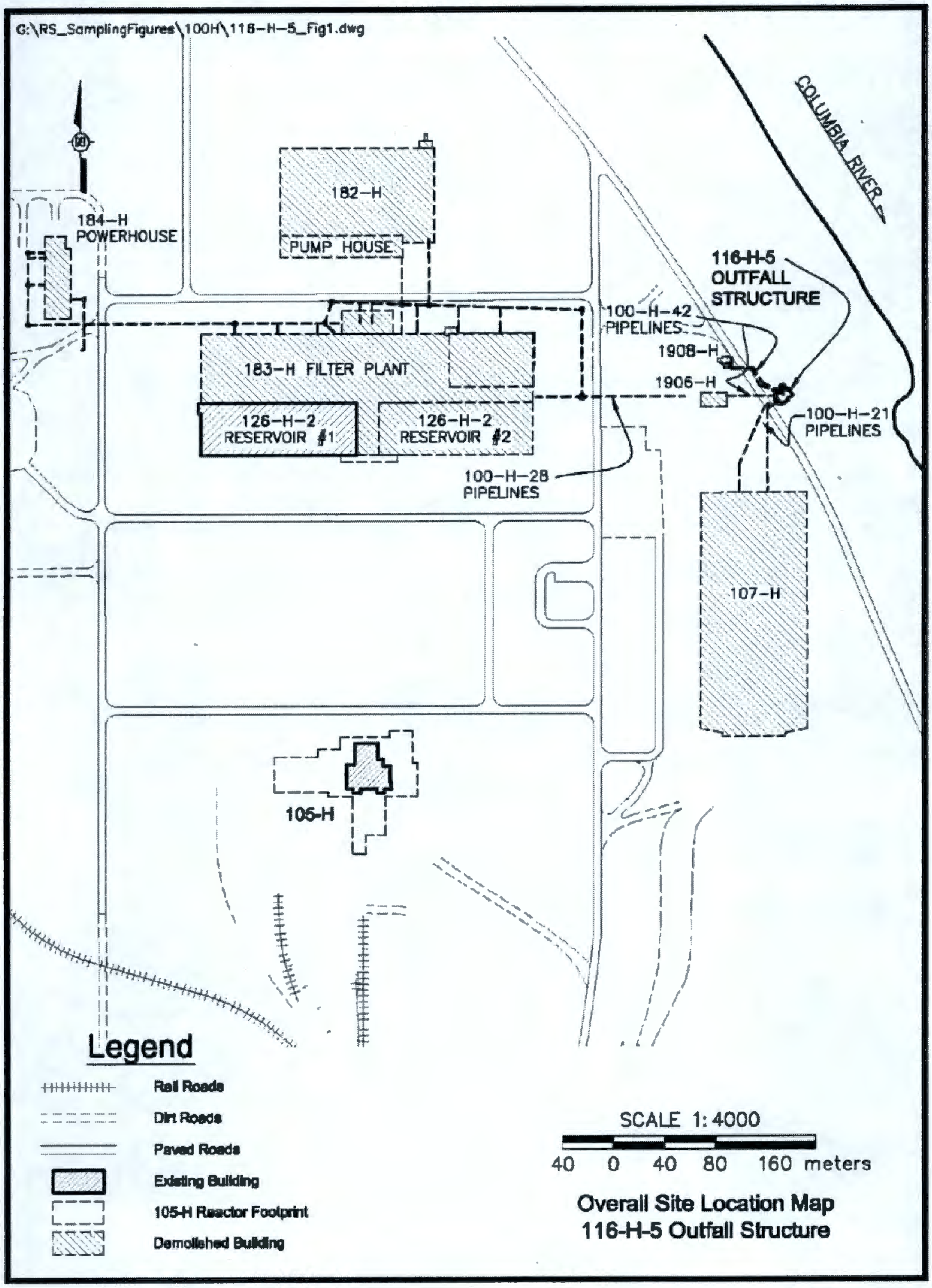
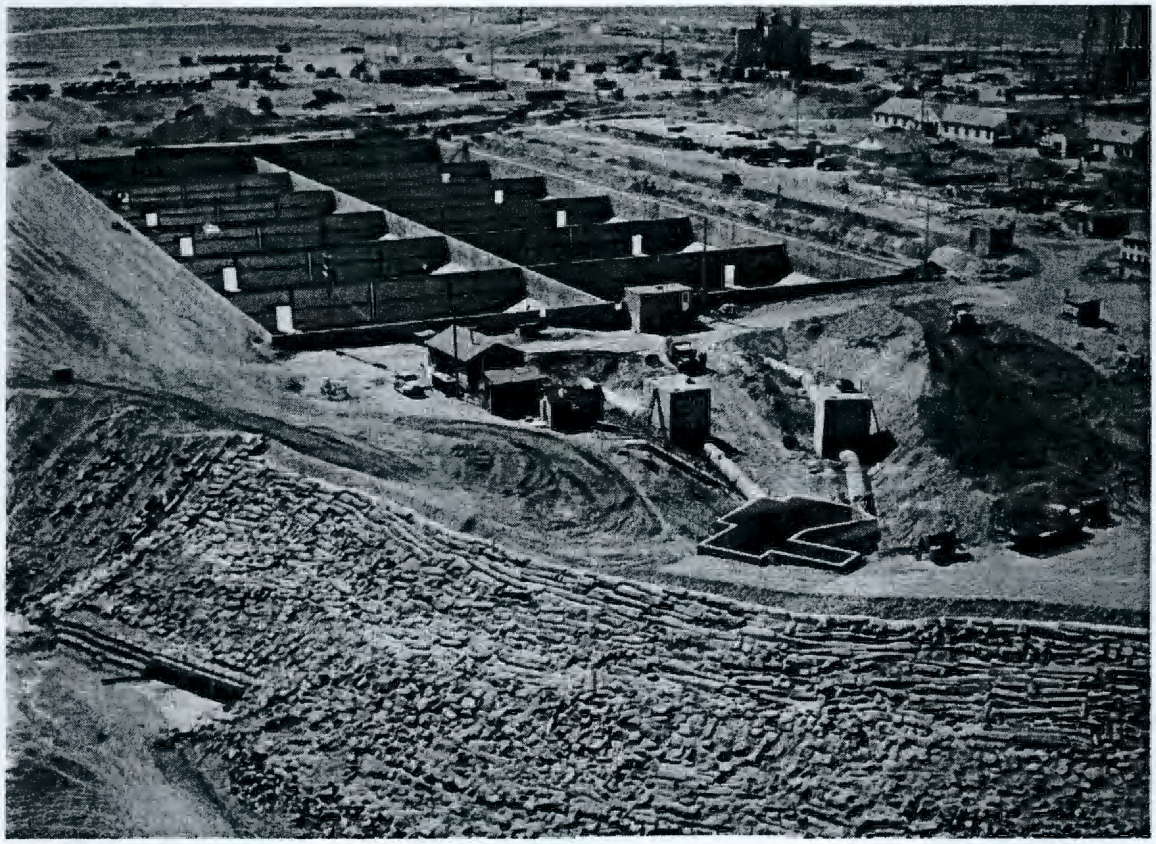


Figure 2. Undated Photograph of the Construction of the 116-H-5 Outfall Structure.



The 116-H-5, 1904-H Outfall Structure was a liquid waste site that operated from 1949 to 1965, as a weir box to discharge 105-H Reactor coolant water and process sewer waste to the Columbia River. The 116-H-5 outfall received effluent via the 100-H-21, 100-H Reactor Cooling Water Effluent Underground Pipelines from the 116-H-7, 107-H Retention Basin and the 100-H-42 process sewer pipelines from the 1906-H Drainage Lift Station. The 100-H-28:2 pipelines fed into the 1906-H Drainage Lift Station. A 6-in.-diameter steel effluent sample line and an 8-in.-diameter steel sample drain line, both a part of the 100-H-42 pipelines, extend between the outfall and the 1908-H Effluent Monitoring Station. Water flowed from the outfall structure and discharged to the Columbia River via the 100-H-34, 100-H River Effluent Pipelines. In the event that the outfall river effluent pipelines became plugged or received too much flow, effluent would back up into the outfall structure and overflow into the 100-H-36 underground concrete sluiceway that led to the river (BHI 1995).

REMEDIAL ACTION SUMMARY

Remedial action at the 116-H-5 waste site began on November 17, 2008, and continued through April 9, 2009, to a depth of approximately 7 m (23 ft) on the eastern side of the excavation and 13 m (43 ft) on the western side of the excavation. The excavation resulted in approximately 2,510 bank cubic meters (BCM) (3,283 bank cubic yards [BCY]) of contaminated soil and debris being removed for disposal at the Environmental Restoration Disposal Facility (ERDF). Approximately 15,696 BCM (20,529 BCY) of overburden material was stockpiled southwest of the excavation for use as clean backfill. The overburden material, including the installed riprap along the river slope was excavated up to the concrete outfall structure walls. Most of the contaminated soil was direct loaded from the excavation; however, small staging pile areas were used for pipe, concrete, and fence material, which were later loaded out and disposed at the ERDF. The post remediation topography map is presented in Figure 3.

Several pipelines that discharged to or from the 116-H-5, 1904-H Outfall Structure remain at the site. A 183-cm (72-in.) reinforced concrete pipe that transferred effluent from the 1906-H Building to the 116-H-5 outfall remains near the base of the western sidewall of the 116-H-5 excavation (Figure 4). The pipeline is part of the 100-H-42, 1906-H Drainage Lift Station waste site and will be remediated at a later date (WCH 2009). Two small-diameter pipelines, also a part of the 100-H-42 waste site, that extended between the 1908-H Effluent Monitoring Station and the outfall were removed during the 116-H-5 excavation. The 100-H-36 spillway, shown as three square openings on the left side of Figure 4 and on the right side of Figure 5, and the 100-H-34 river effluent pipelines (middle of Figure 5) remain. The 100-H-34 river effluent pipelines have been capped as shown in Figures 6 and 7.

Columnar basalt riprap boulders, cemented together and used as a retaining wall, were also excavated from the site and will be used as backfill. The basalt riprap was installed along the river slope near the outfall structure to prevent erosion of the slope during high river levels. There is no evidence or historical information that would indicate the basalt riprap was contaminated during operation due to spills. Radiological surveys were conducted during the removal of the riprap and no contamination was detected.

The debris removed from the 116-H-5 waste site was consistent with that of an outfall structure and consistent with the pre-excavation geophysical survey findings. No anomalies were discovered during the remediation.

A Global Positioning Environmental Radiological Surveyor (GPERS) survey was conducted within the 116-H-5 excavation upon completion of remedial action activities. The gamma radiation survey was performed to determine the amount of gamma radiological contamination present after excavation. This post-excavation survey conducted on May 11, 2009, identified no residual gamma radioactivity within the site. Portions of the 100-H-36 spillway, 100-H-42 pipeline, and the 100-H-34 River Effluent Pipeline structures remain in the 116-H-5 waste site; therefore, it was not possible to perform a GPERS survey over the entire surface of the site (Figure 8). All accessible areas were surveyed. Gamma GPERS surveys were conducted on the overburden pile at various times during overburden removal. The overburden removal occurred in several lifts of approximately 1.8 to 3 m (6 to 10 ft) at a time. No gamma radiological contamination was identified within the overburden as indicated on Figures 9, 10, and 11.

Figure 3. 116-H-5 Post Remediation Topography Map.

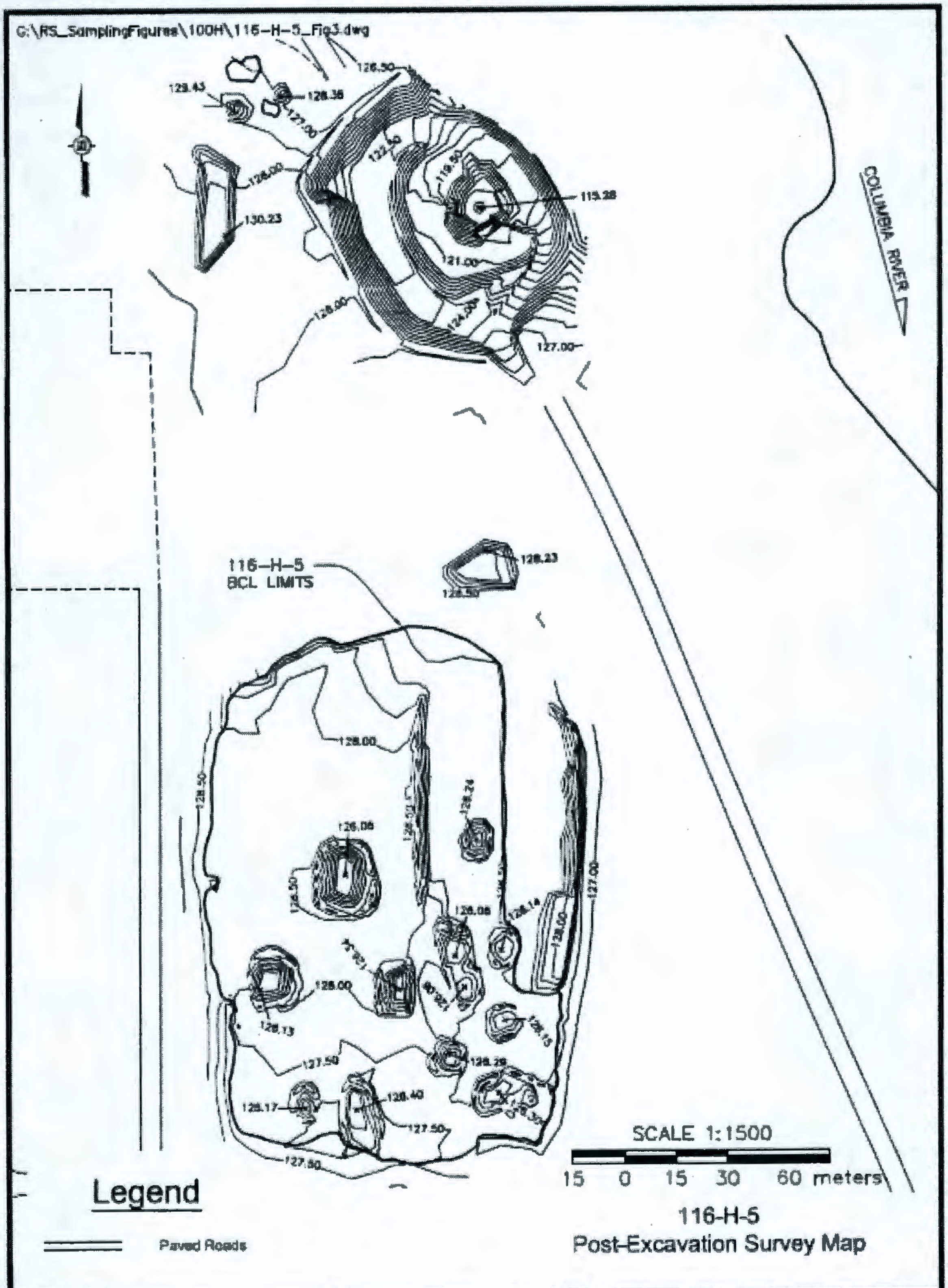


Figure 4. Photograph of the 100-H-42 Pipeline and 100-H-36 Spillway Remaining in the 116-H-5 Excavation.

Figure 5. Photograph of the 100-H-34 River Effluent Pipelines Remaining in the 116-H-5 Excavation.

Figure 6. Photograph of the 100-H-34 River Effluent Pipeline Forms.

Figure 7. Photograph of the Capped 100-H-34 River Effluent Pipelines.

Figure 8. 116-H-5 GPERS Radiological Survey Gamma Track Map.

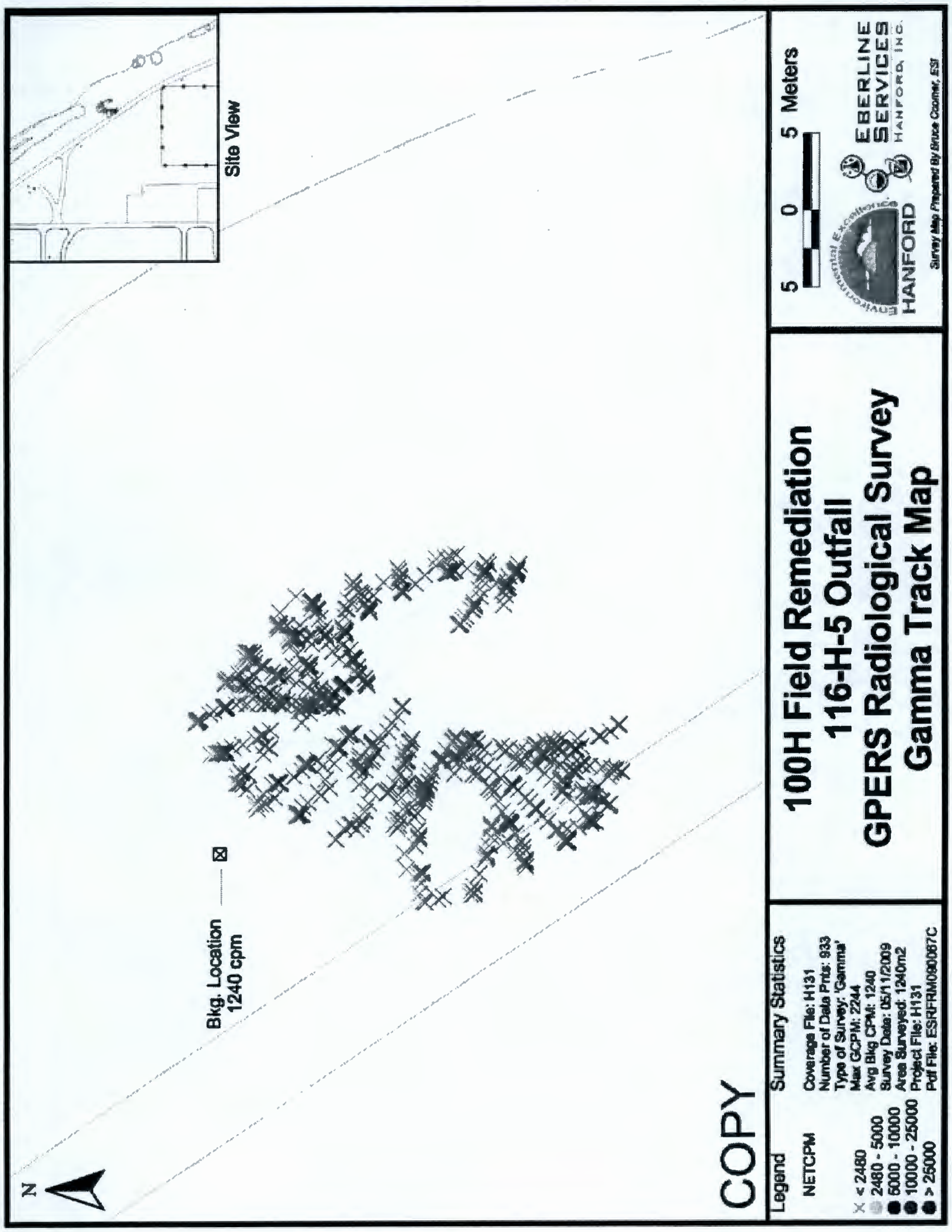


Figure 9. 116-H-5 Overburden GPERS Radiological Survey Gamma Track Map (January 14, 2009).

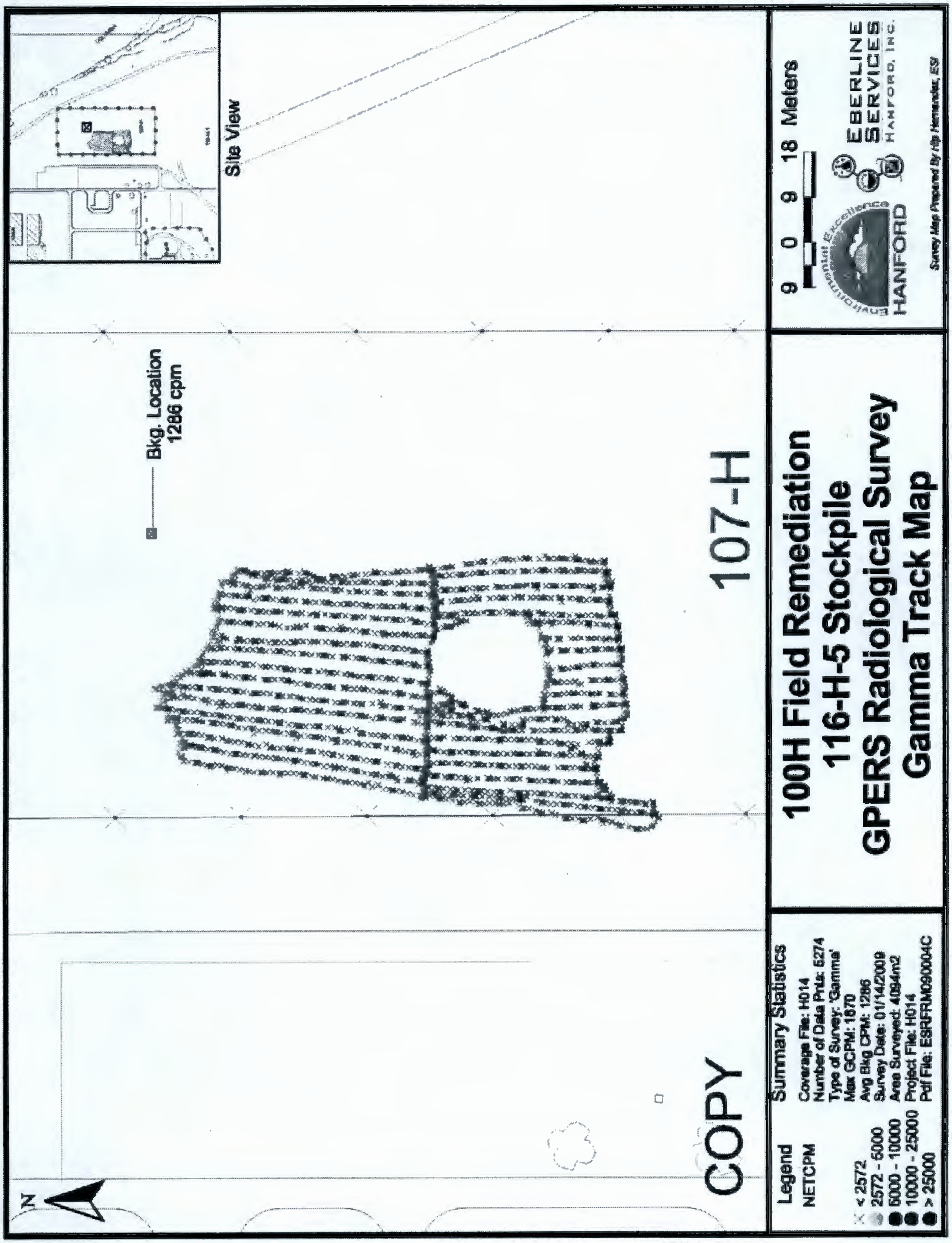


Figure 10. 116-H-5 Overburden GPERS Radiological Survey Gamma Track Map (January 21, 2009).

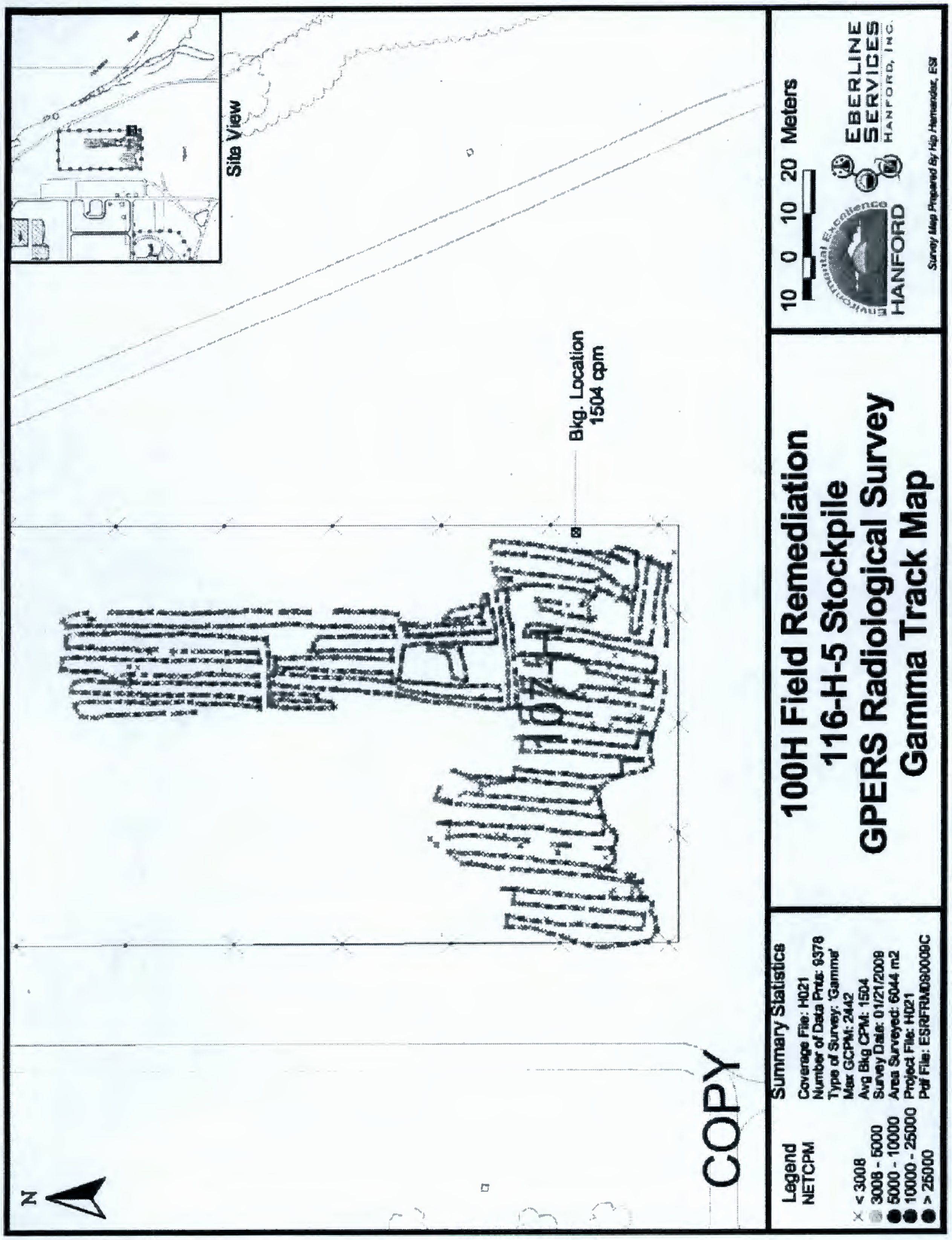
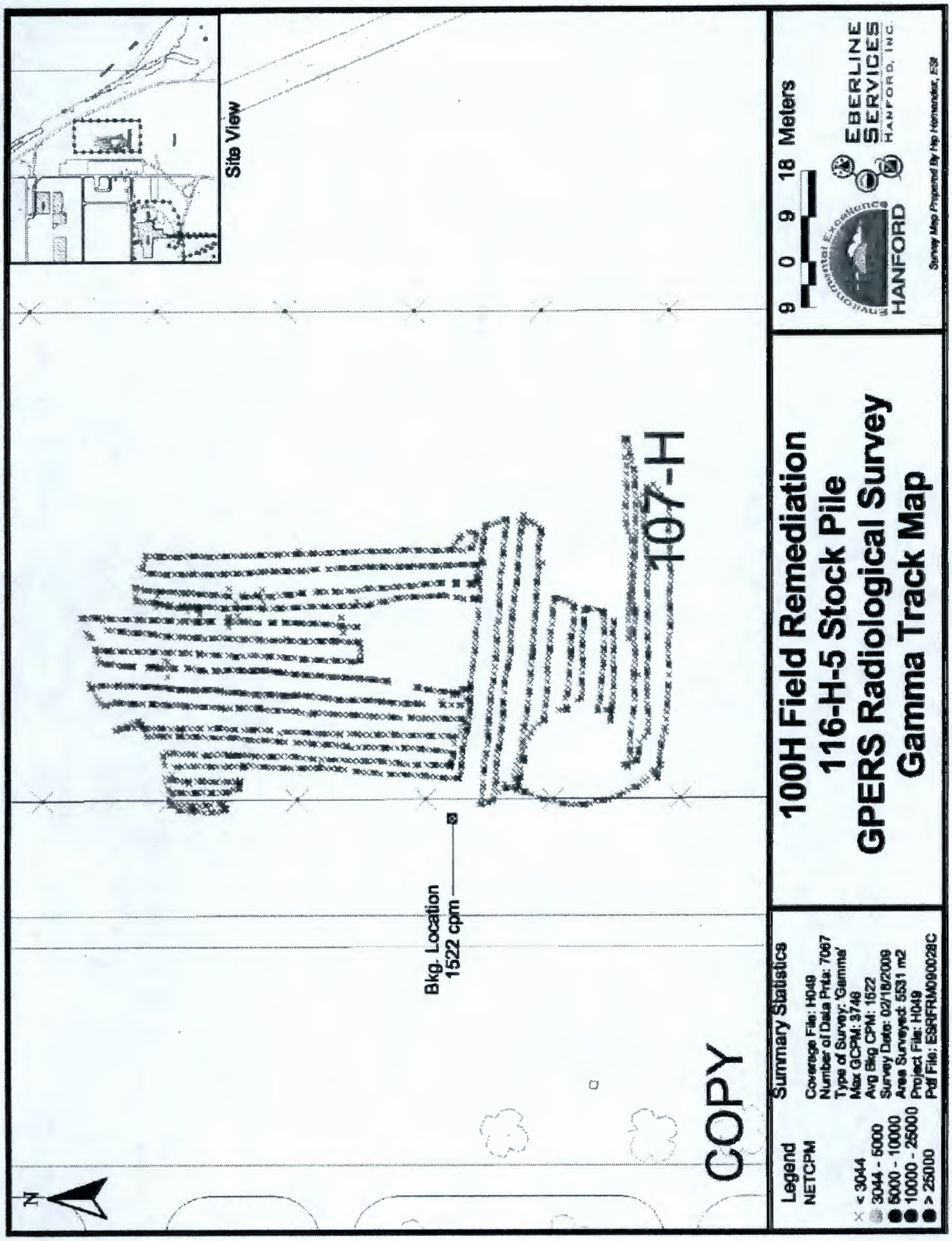


Figure 11. 116-H-5 Overburden GPERS Radiological Survey Gamma Track Map (February 18, 2009).



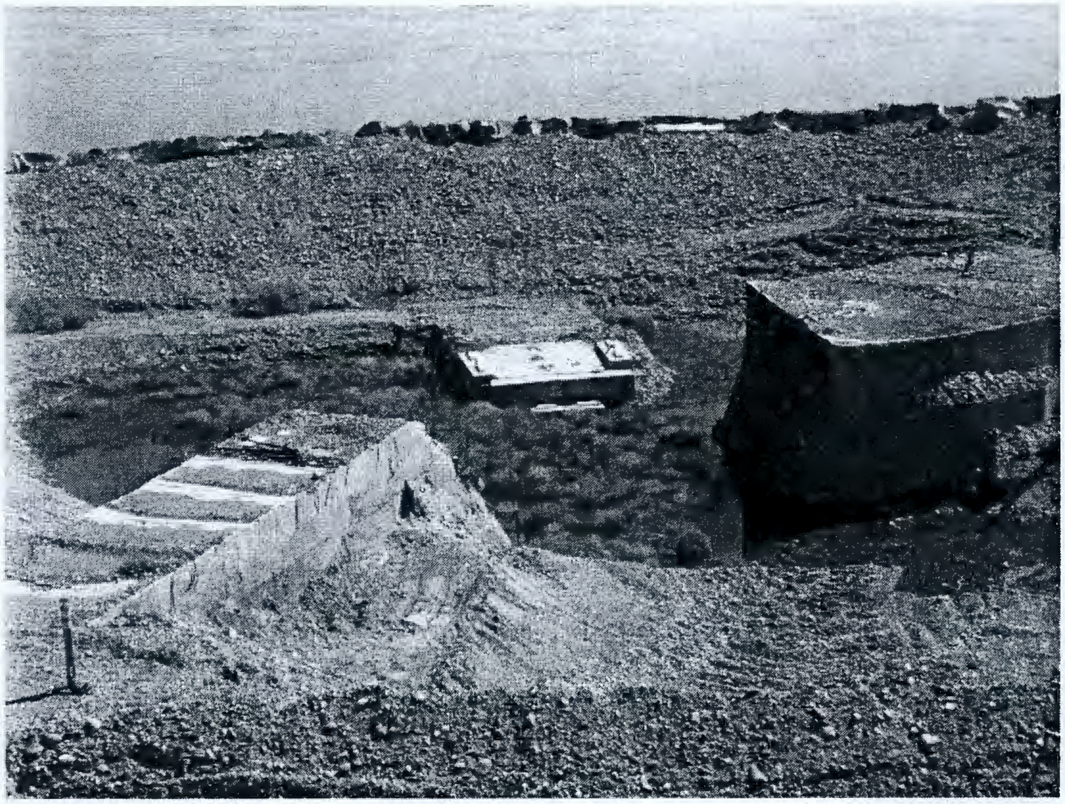
Additional Remediation

Following sample analysis of the original excavation, it was determined that additional remediation was needed because some sample locations exceeded cleanup criteria for some ICP metals, SVOCs, PAHs, pesticides, and PCBs. This extra remediation, with agreement from the Washington State Department of Ecology, was conducted from February 11 through March 15, 2011. Approximately 5,813.8 BCM (7,604.2 BCY) of additional soil was removed from areas that exceeded direct exposure and/or groundwater and river protection RAGs in the shallow-zone excavation, deep-zone excavation, and overburden soil stockpile. The removal of extra material from these decision units did not change the original boundary for the areas and the original sample design was utilized. Due to the number of deep zone sample locations that exceeded the RAGs, with concurrence from Ecology (WCH 2011c), the entire deep zone decision unit was excavated and sampled again with a reduced contaminant of potential concern (COPC) list including inductively coupled plasma (ICP) metals, mercury, semivolatile organic compounds (SVOCs), and polycyclic aromatic hydrocarbons (PAH) analysis. Sample results for the original deep zone decision unit are included in Appendix B. Samples within the staging area footprints 1, 3, and 4 also exceeded direct exposure RAGs and needed to be remediated and resampled. The footprint for area 1 was widened due to debris being present outside the original area boundary. Area 2 does not appear to have been used as a waste staging pile area as the site appears to be undisturbed (Figure 12). Additionally, all sample results from area 2 were below the RAGs. As a result, a new sample design was implemented for the waste staging pile footprint that excluded area 2. Sample results for the original staging pile area decision unit are included in Appendix B.

Figure 12. Staging Pile Footprint of Unutilized Area 2 (July 15, 2010).

Following the second sample analysis, it was determined that additional remediation was still required because some sample locations within the deep zone decision unit exceeded cleanup criteria for some ICP metals, SVOCs and PAHs. This extra remediation was conducted on April 11 and 12, 2011. Approximately 658.6 BCM (861.4 BCY) of additional soil was removed from areas that exceeded groundwater and river protection RAGs in the deep zone decision unit (Figure 13). No samples exceeded direct exposure cleanup criteria. Additional remediation did not occur at one location that exceeded the groundwater and river protection cleanup criteria for lead because of the close proximity of the sample location to the 100-H-42 pipeline that enters the outfall excavation. This location will be included in the remediation of the 100-H-42, 1906-H Drainage Lift Station at a future date. A site-specific RESidual RADioactivity (RESRAD) calculation was conducted on this sample location and the results show that the lead concentration is predicted to be protective of groundwater and the Columbia River (Appendix C). The removal of extra material from this decision unit did not change the original boundary for the deep zone, and the original sample design with the second sampling campaign COPC list was utilized.

Figure 13. Completion of Additional Remediation Effort at the Outfall (May 18, 2011).



Due to sample results for the overburden soil stockpiles exceeding cleanup criteria for protection of groundwater and the river, the use of overburden for backfill will be restricted to the upper portion of the excavation, at a depth supported by modeling. It is estimated that a minimum 2-m (6.6-ft)-thick layer of clean borrow material will be placed into the excavation prior to use of overburden soil for backfill. This 2.0 m (6.6 ft) layer is based on the lowest distribution Kd value (lead of 30 mL/g) of the contaminants exceeding RAGs in the overburden decision unit. Based on this Kd value, contaminants are not expected to migrate more than 1.8 m (6.0 ft) vertically, in 1,000 years based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b). Therefore, a 2.0 m (6.6 ft) vadose zone layer is protective of groundwater and the Columbia River.

VERIFICATION SAMPLING ACTIVITIES

Statistical verification sampling was conducted at the 116-H-5 waste site on May 13 through 18, 2010 (WCH 2011a), to support a determination that residual contaminant concentrations in the soil meet cleanup criteria specified in the RDR/RAWP (DOE-RL 2009b) and the Remaining Sites ROD (EPA 1999). A statistical sampling design was used to collect verification soil samples from the 116-H-5 excavation and the overburden soil stockpile to support closeout of the waste site. The following subsections provide additional discussion of the information used to develop the verification sampling design. The verification sample results, provided in

Appendix D, indicate that the waste removal action achieved compliance with the remedial action objectives (RAOs) for the site.

Additional verification sampling was conducted at the 116-H-5 waste site on March 16, 2011, following the second remediation campaign of the failed locations (WCH 2011a). Further verification sampling was also conducted on April 13, 2011 following the third remediation campaign of failed sample locations (WCH 2011b).

Contaminants of Concern/Contaminants of Potential Concern

The contaminants of potential concern (COPCs) for the 116-H-5 outfall structure, specified in the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2009a), are identified as americium-241, carbon-14, cobalt-60, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, plutonium-238, plutonium-239/240, strontium-90, technetium-99, uranium-234, uranium-235, uranium-238, chromium (total), chromium VI, mercury, and lead. Based on process knowledge and analyses of shallow and deep-zone soil samples at the 116-H-7 retention basin (BHI 2001b), it is also appropriate to include arsenic and polychlorinated biphenyls (PCBs) on the list of COPCs for the 116-H-5 waste site. Semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), pesticides, and ion chromatography (IC) anions were added as COPCs, as they were detected in the 100-H-28:2 pipeline confirmatory samples (WCH 2006).

Although not considered COPCs, antimony, barium, beryllium, boron, cadmium, cobalt, copper, magnesium, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc were evaluated by performing analyses for the constituents of the expanded inductively coupled plasma (ICP) metals lists.

After the initial sampling campaign, a second remediation and sampling campaign was needed to remove areas with values that exceeded the cleanup criteria. With Ecology concurrence (WCH 2011c), the original COPC lists were then utilized for all re-sampled areas except for the deep zone decision unit in which only ICP metals, mercury, SVOCs, and PAH were analyzed.

After the second sampling campaign, additional remediation was again needed to remove areas with values that exceeded the cleanup criteria in the deep zone decision unit. All remediated areas were re-sampled using the original sample design and the COPC list from the second sampling campaign of the deep zone.

Verification Sample Design

This section describes the basis for selection of the sample design and determination of the number of verification samples. The 116-H-5 waste site was divided into four decision units for verification sampling: the shallow-zone excavation, the deep-zone excavation, the overburden soil stockpile, and the staging pile area footprint. A global positioning survey was used to determine the boundaries of the shallow- and deep-zone excavation, the overburden soil stockpile, and the staging pile area footprint requiring soil verification sampling, and the statistical sampling designs for each were prepared using Visual Sample Plan[1] (VSP). A triangular grid is used based on studies that indicate triangular grids are superior to square grids (Gilbert 1987). Additional details concerning the use of VSP to develop the statistical sampling design and derive the number of verification samples to collect are discussed in Appendix B of the verification work instruction (WCH 2010).

Twelve verification soil samples were collected from the shallow-zone excavation including one duplicate (Figure 14). Twelve verification soil samples were collected from the deep-zone excavation including one duplicate (Figure 15). Sample location 7 within the deep zone was located beneath standing water. Therefore, the sample had to be moved 0.66 (2.0 ft) south and 1.9 m (6.5 ft) east to be adequately sampled. Fifteen verification soil samples were collected from the overburden soil stockpile including 1 duplicate (Figure 16). Fifteen were chosen to encompass all 5 overburden areas. Also, 12 verification soil samples were collected from the staging pile area footprint including 1 duplicate (Figure 17). One equipment blank was collected to verify the cleanliness of equipment and supplies used for sample collection.

Portions of the deep zone were not accessible due to concrete-encased pipes reinforced with rebar (as shown in Figures 4 and 5) and were excluded from the sample design. Additionally, portions of the southern-most overburden soil stockpile were excluded from the sample design due to mud dauber contamination. Overburden soil was not deposited in areas identified as mud dauber contamination areas.

The verification data from the decision units was evaluated using the 95% upper confidence limit (UCL) on the true population mean for residual concentrations of COPCs as specified by the RDR/RAWP (DOE-RL 2009b). These calculations are provided in Appendix D. When a nonradionuclide COPC was detected in fewer than 50% of the verification samples collected, the maximum detected value was used for comparison against the RAGs. If no detections for a given COPC were reported in the data set, then no statistical evaluation or calculations were performed for that COPC.

[1] Visual Sample Plan is a map-based user-interface program that may be downloaded at http://dqo.pnl.gov.

Figure 14. 116-H-5 Excavation Shallow Zone Sample Locations.

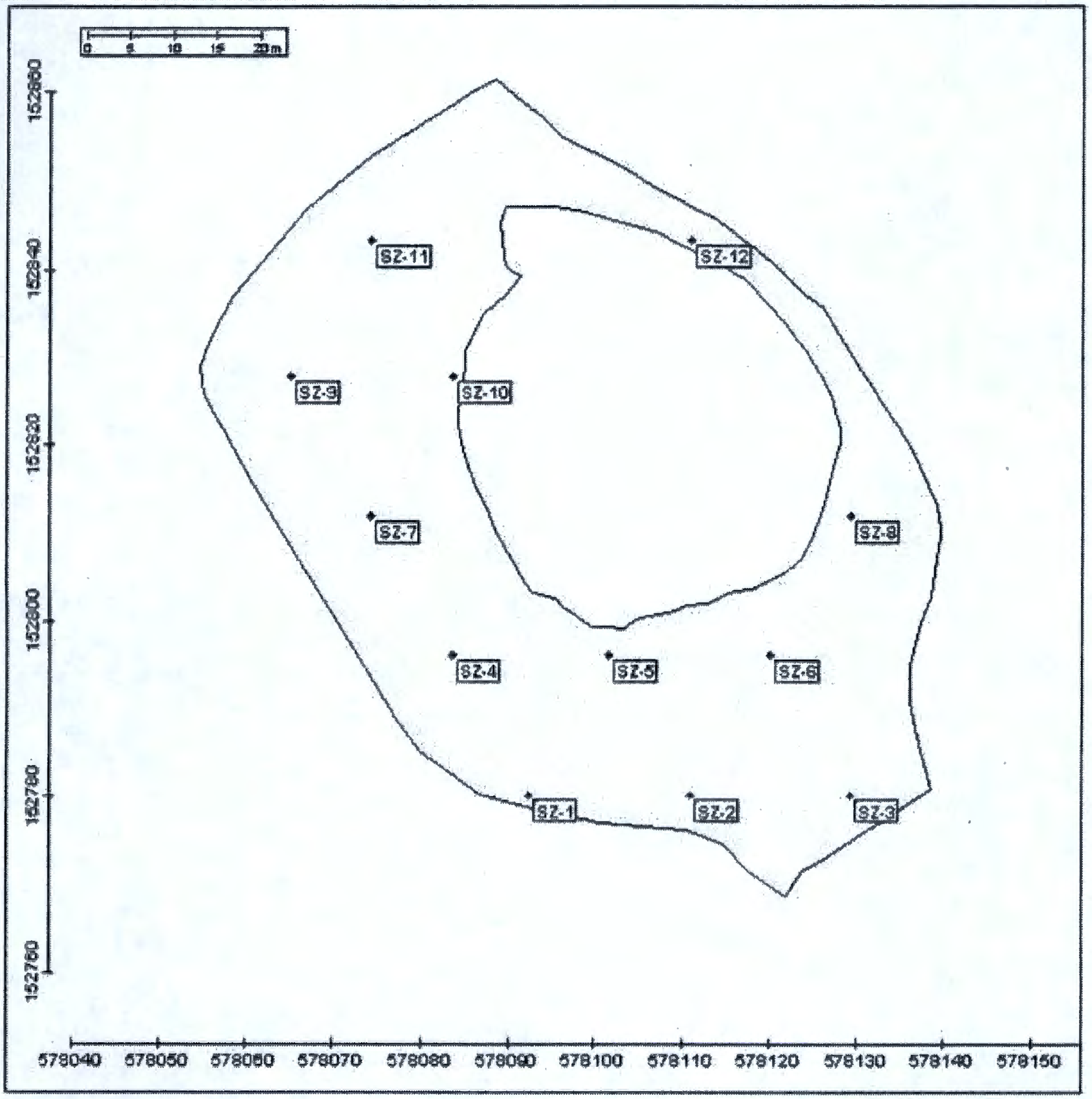


Figure 15. 116-H-5 Excavation Deep Zone Sample Locations.

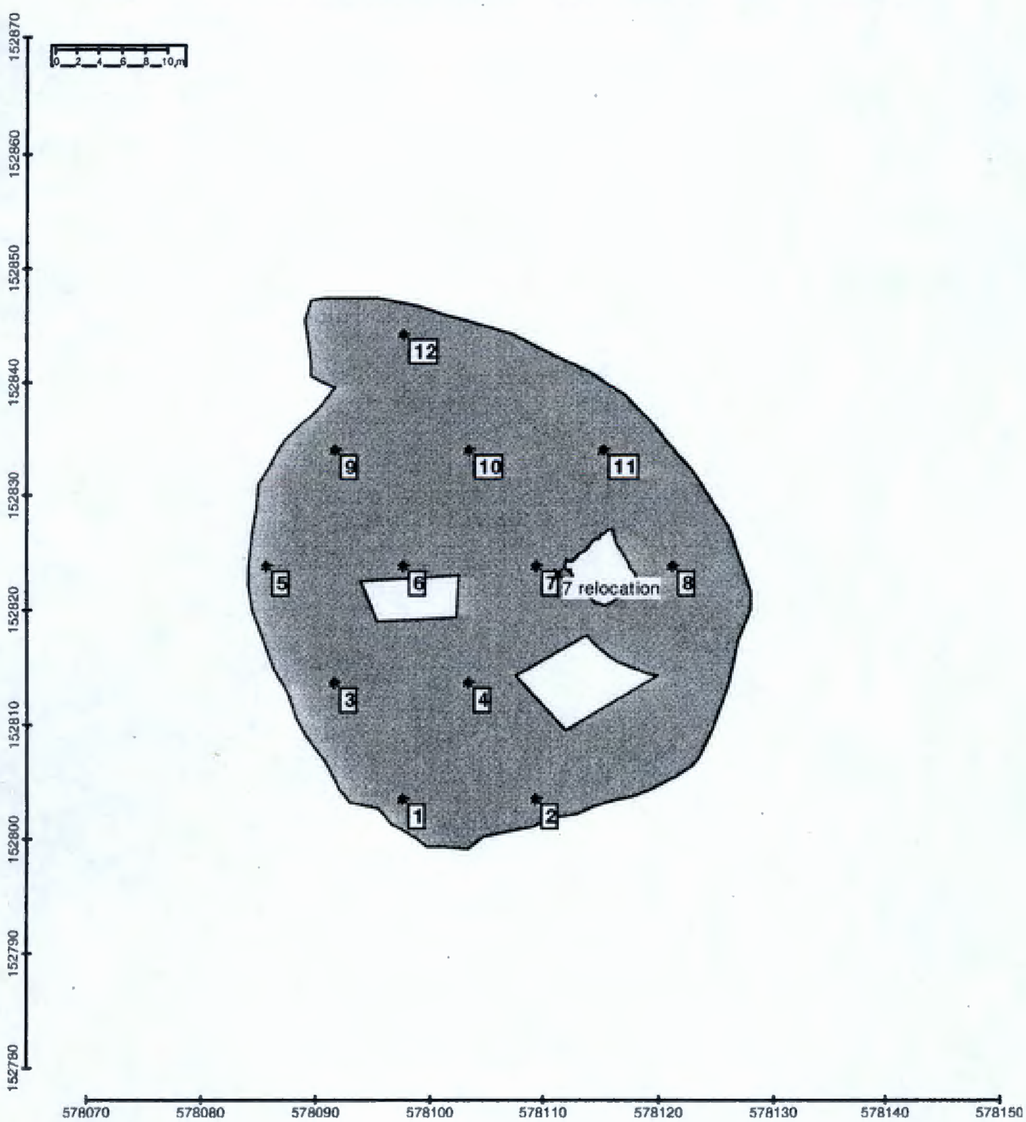


Figure 16. 116-H-5 Overburden Soil Stockpile Sample Locations.

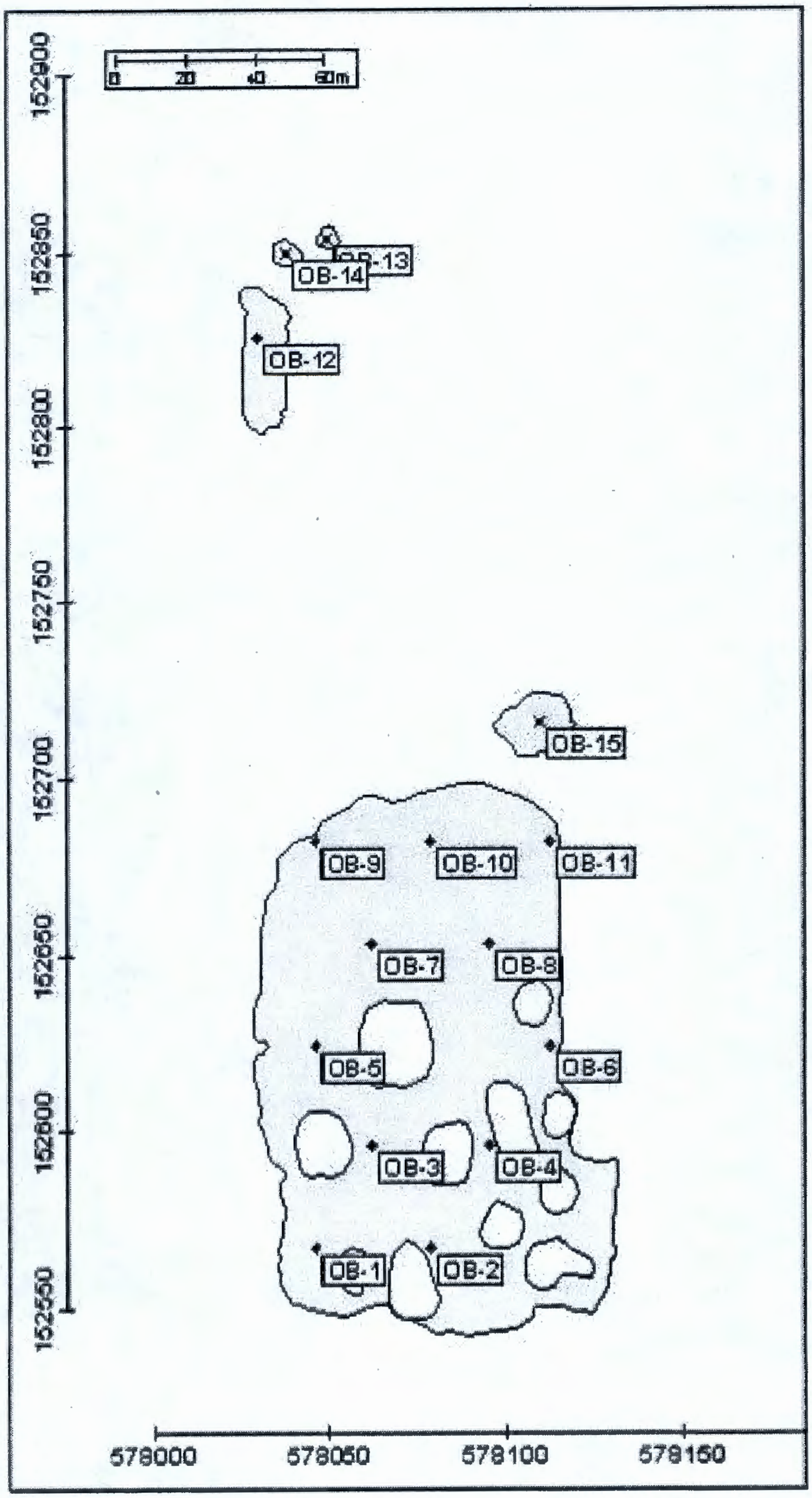
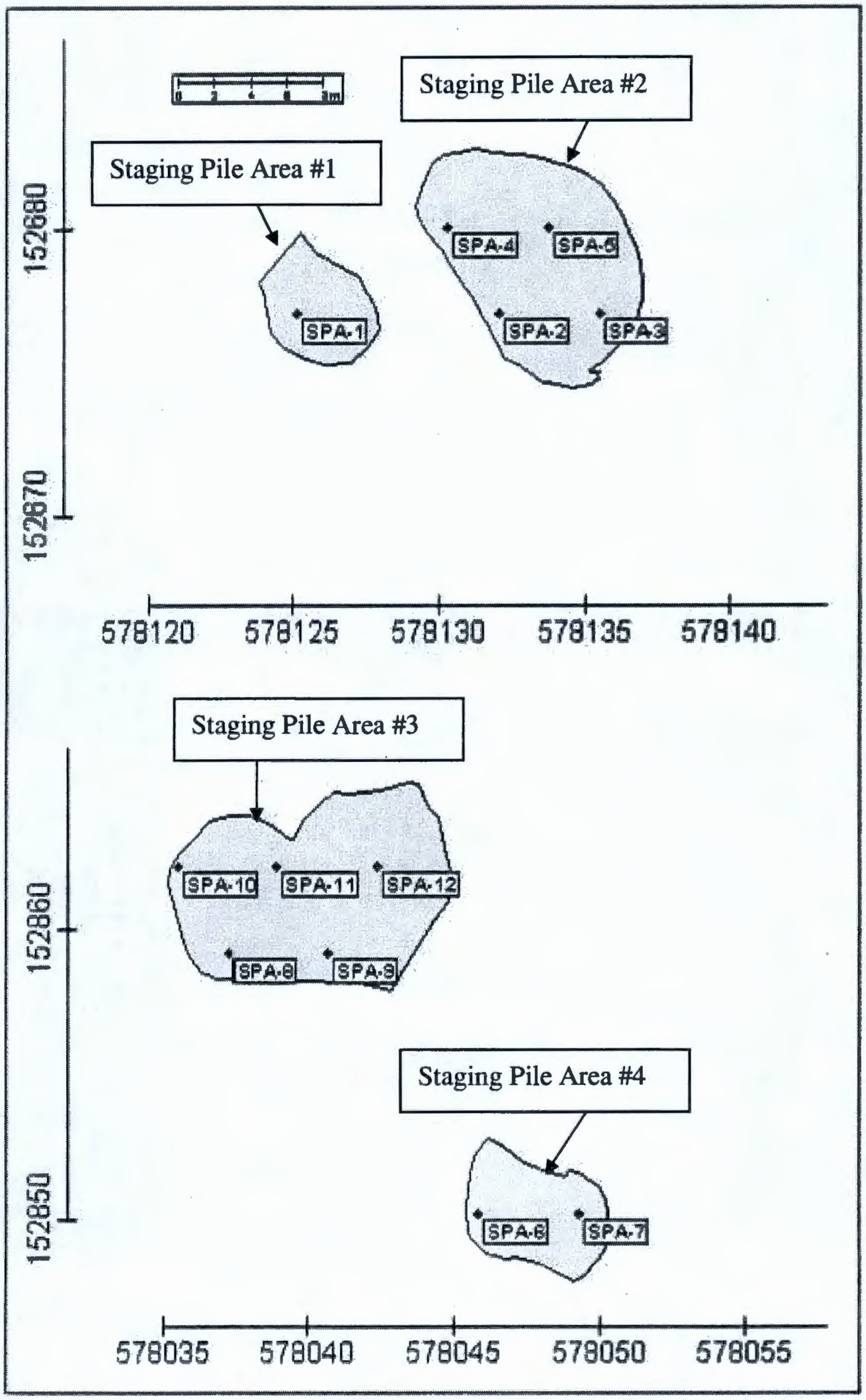


Figure 17. 116-H-5 Waste Staging Pile Area Sample Locations.



One discrete soil sample was collected at each verification sample location of surficial soils (0 to 0.15 m [0 to 6 in.] below ground surface). Each sample was analyzed for the constituent groups listed in Table 1. All samples were requested for full protocol laboratory analysis.

After the initial verification samples were analyzed, it was determined that some sample locations in each decision unit exceeded the site cleanup criteria. The entire deep zone exceeded cleanup criteria except for sample location 2, along with sample locations 9 and 11 in the shallow zone, and sample location 8 in the overburden. Therefore, those locations that exceeded RAGs, as well as sample location 2 in the deep zone, were remediated and re-sampled using the original sample design (WCH 2011a). Location 7 within the deep zone was sampled at the new location as depicted in Table 1, as the original sample design coordinates placed this sample under water. The waste staging area footprint exceeded RAGs within areas 1, 3, and 4, but not area 2. Thus, after remediation of areas 1, 3, and 4, a new sample design was completed that excluded area 2 from re-sampling. Figure 18 includes area 1, while Figure 19 includes areas 3 and 4. Sample results for the original, failed deep zone and staging pile area verification samples are included in Appendix B.

Table 1. 116-H-5, 1904-H Outfall Structure Sample Summary. (2 Pages)

Sample Location	HEIS Sample Number	WSP Coordinates		Sample Analysis
		Northing	Easting	
SZ-1	J19YB8	152780.1	578092.5	ICP metals [a], mercury, hexavalent chromium, PCBs, SVOA, TPH, IC anions [b], nitrates/nitrites [c], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium
SZ-2	J19YB9	152780.1	578110.8	
SZ-3	J19YC0	152780.1	578129.2	
SZ-4	J19YC1	152796.0	578083.3	
SZ-5	J19YC2	152796.0	578101.7	
SZ-6	J19YC3	152796.0	578120.0	
SZ-7	J19YC4	152811.9	578074.2	
SZ-8	J19YC5	152811.9	578129.2	
SZ-9	J19YC6	152827.7	578065.0	
SZ-10	J19YC7	152827.7	578083.3	
SZ-11	J19YC8	152843.6	578074.2	
SZ-12	J19YC9	152843.6	578110.8	
Duplicate [d]	J19YD0	152780.1	578110.8	
DZ-1	J19YD1	152803.4	578097.5	ICP metals [a], mercury, hexavalent chromium, PCBs, SVOA, TPH, IC anions [b], nitrates/nitrites [c], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium
DZ-2	J19YD2	152803.4	578109.3	
DZ-3	J19YD3	152813.7	578091.6	
DZ-4	J19YD4	152813.7	578103.4	
DZ-5	J19YD5	152823.9	578085.7	
DZ-6	J19YD6	152823.9	578097.5	
DZ-7 (under water)	J19YD7	152823.9	578109.3	
DZ-7 (new location)	J19YD7	152823.2	578111.2	
DZ-8	J19YD8	152823.9	578121.1	
DZ-9	J19YD9	152834.1	578091.6	
DZ-10	J19YF0	152834.1	578103.4	
DZ-11	J19YF1	152834.1	578115.2	
DZ-12	J19YF2	152844.3	578097.5	
Duplicate [d]	J19YF3	152803.4	578097.5	

Table 1. 116-H-5, 1904-H Outfall Structure Sample Summary. (2 Pages)

Sample Location	HEIS Sample Number	WSP Coordinates		Sample Analysis
		Northing	Easting	
OB-1	J19YF4	152567.1	578045.8	ICP metals [a], mercury, hexavalent chromium, PCBs, SVOA, TPH, IC anions [b], nitrates/nitrites [c], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium
OB-2	J19YF5	152567.1	578079.1	
OB-3	J19YF6	152595.9	578062.5	
OB-4	J19YF7	152595.9	578095.7	
OB-5	J19YF8	152624.7	578045.8	
OB-6	J19YF9	152624.7	578112.3	
OB-7	J19YH0	152653.4	578062.5	
OB-8	J19YH1	152653.4	578095.7	
OB-9	J19YH2	152682.2	578045.8	
OB-10	J19YH3	152682.2	578079.1	
OB-11	J19YH4	152682.2	578112.3	
OB-12	J19YH5	152826.1	578029.2	
OB-13	J1B4H9	152854.3	578050.2	
OB-14	J1B4J0	152849.5	578037.5	
OB-15	J1B4J1	152716.0	578109.7	
Duplicate [d]	J19YH6	152624.7	578045.8	
SPA-1	J19YH7	152677.1	578125.1	ICP metals [a], mercury, hexavalent chromium, PCBs, SVOA, TPH, IC anions [b], nitrates/nitrites [c], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium
SPA-2	J19YH8	152677.1	578132.0	
SPA-3	J19YH9	152677.1	578135.4	
SPA-4	J19YJ0	152680.1	578130.3	
SPA-5	J19YJ1	152680.1	578133.7	
SPA-6	J19YJ2	152850.2	578045.8	
SPA-7	J19YJ3	152850.2	578049.3	
SPA-8	J19YJ4	152859.2	578037.2	
SPA-9	J19YJ5	152859.2	578040.7	
SPA-10	J19YJ6	152862.2	578035.5	
SPA-11	J19YJ7	152862.2	578038.9	
SPA-12	J19YJ8	152862.2	578042.4	
Duplicate [d]	J19YJ9	152859.2	578037.2	
Equipment blank	J19YK0	NA	NA	ICP metals [a], mercury, SVOA

[a] The expanded list of ICP metals will include antimony, arsenic, barium, beryllium, boron, cadmium, chromium(total), cobalt, copper, lead, manganese, magnesium, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package.

[b] The expanded list of IC anions will include bromide, fluoride, and phosphate in the analytical results package.

[c] To preclude holding time issues associated with EPA Method 300.0 for nitrites and nitrates, EPA Method 353 will be performed.

[d] One duplicate soil sample will be collected from each decision unit at a location selected at the project analytical lead's discretion.

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
IC = ion chromatography
ICP = inductively coupled plasma.
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
WSP = Washington State Plane

Figure 18. 116-H-5 Waste Staging Pile Area Sample Locations Following Remediation for Area 1.

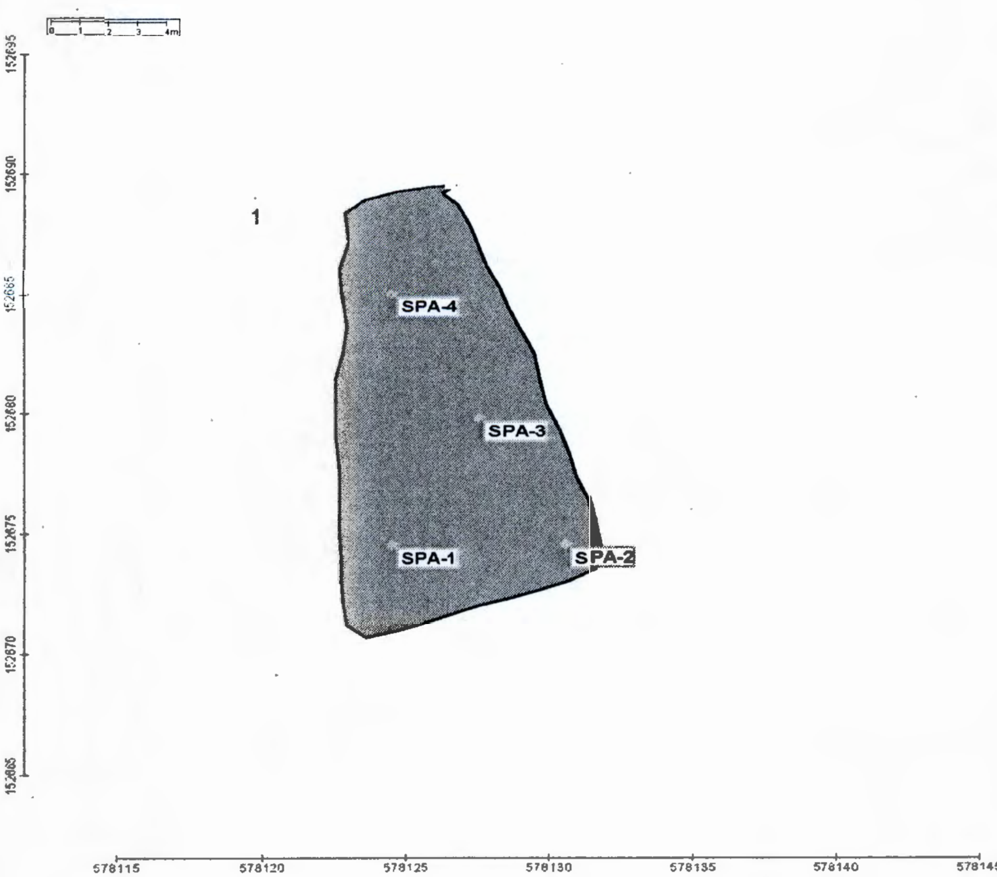
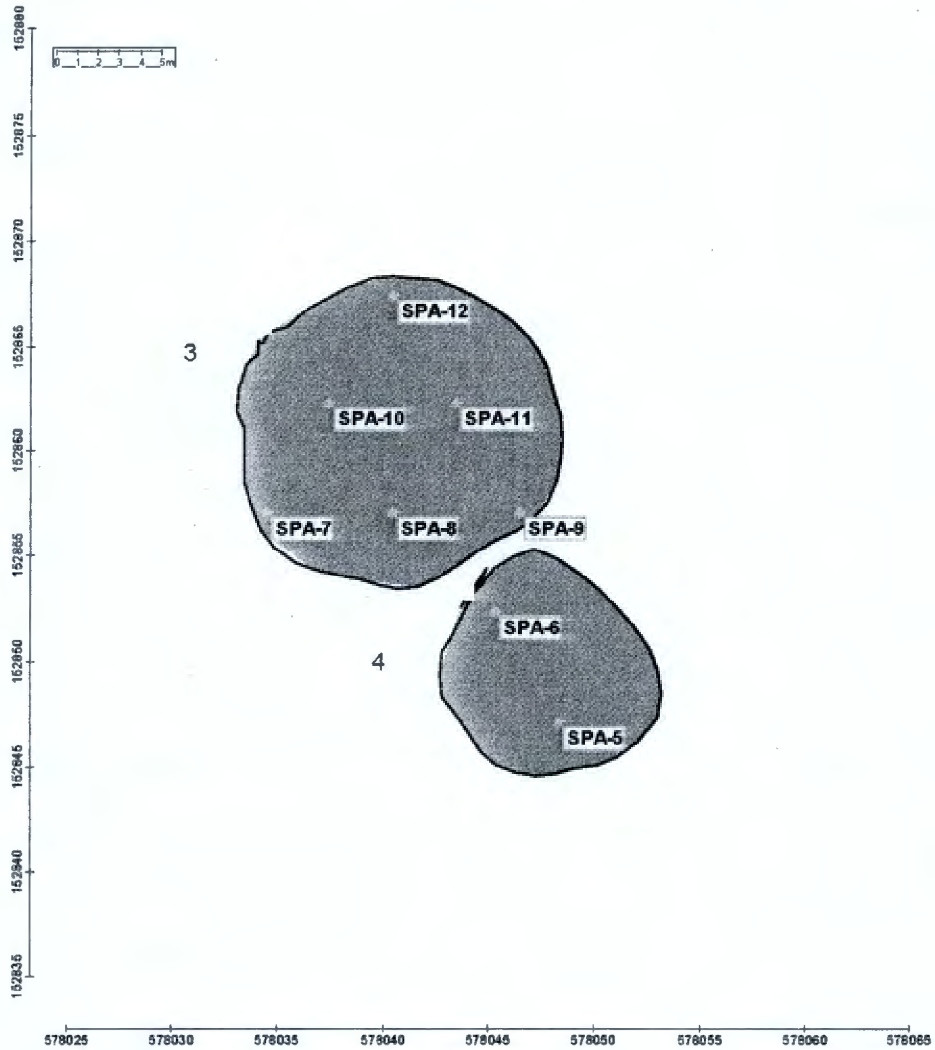


Figure 19. 116-H-5 Waste Staging Pile Area Sample Locations Following Remediation for Areas 3 and 4.



After the second verification samples were analyzed, it was determined that some sample locations in the deep zone and staging pile area decision unit exceeded the groundwater and river protection site cleanup criteria. Sample locations 1 through 5, 7, and 8 in the deep zone exceeded cleanup criteria, along with sample location 12 in the staging pile area. Additional material was removed locations 1 through 4, 7, and 8 from these deep-zone locations and replacement samples were collected using the original sample design and the list of COPCs from the second sampling campaign (WCH 2011b). Location 7 within the deep zone was sampled at the new location as depicted in Table 1, as the original design coordinates placed this sample under water. Sample 5 was not remediated additionally because of the close proximity of the sample location to the 100-H-42 pipeline and the difficult task of further excavation in this area. Sample 12 in the staging pile area was also not remediated additionally because the sample results at this location passed a site-specific RESRAD calculation that shows residual soil concentrations are protective of groundwater and the river (Appendix C).

A summary of the verification samples collected and laboratory analyses performed following the second remediation campaign is provided in Table 2. Table 3 includes a summary of the verification samples collected and laboratory analyses performed for the additional samples taken following the third remediation campaign. All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the SAP (DOE-RL 2009a). Additional information related to verification sampling can be found in the field sampling logbooks (WCH 2011a, 2011b).

Table 2. 116-H-5, First Re-sample Summary. (2 Pages)

Sample Location	HEIS Sample Number	WSP Coordinates		Sample Analysis
		Northing	Easting	
Deep Zone				
DZ-1	J1FKK1	152803.4	578097.5	ICP metals [a], mercury, SVOA, PAH
DZ-2	J1FKK2	152803.4	578109.3	
DZ-3	J1FKK3	152813.7	578091.6	
DZ-4	J1FKK4	152813.7	578103.4	
DZ-5	J1FKK5	152823.9	578085.7	
DZ-6	J1FKK6	152823.9	578097.5	
DZ-7	J1FKK7	152823.2	578111.2	
DZ-8	J1FKK8	152823.9	578121.1	
DZ-9	J1FKK9	152834.1	578091.6	
DZ-10	J1FKL0	152834.1	578103.4	
DZ-11	J1FKL1	152834.1	578115.2	
DZ-12	J1FKL2	152844.3	578097.5	
Duplicate [b]	J1FKL3	152823.9	578121.1	
Shallow Zone				
SZ-9	J1FKL4	152827.7	578065.0	ICP metals [a], mercury, Cr^{+6}, PCBs, SVOA, TPH, IC anions [c], nitrates/nitrites [d], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium
SZ-11	J1FKL5	152843.6	578074.2	
Overburden				
OB-8	J1FKL6	152653.4	578095.7	ICP metals [a], mercury, Cr^{+6}, PCBs, SVOA, TPH, IC anions [c], nitrates/nitrites [d], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium

Table 2. 116-H-5, First Re-sample Summary. (2 Pages)

Sample Location	HEIS Sample Number	WSP Coordinates		Sample Analysis
		Northing	Easting	
Staging Pile Area				
SPA-1	J1FKL7	152674.6	578124.6	ICP metals [a], mercury, Cr^{+6}, PCBs, SVOA, TPH, IC anions [c], nitrates/nitrites [d], PAH, pesticides, GEA, carbon-14, nickel-63, tritium, strontium-90, technetium-99, isotopic uranium, isotopic plutonium
SPA-2	J1FKL8	152674.6	578130.6	
SPA-3	J1FKL9	152679.9	578127.6	
SPA-4	J1FKM0	152685.1	578124.6	
SPA-5	J1FKM1	152847.2	578048.3	
SPA-6	J1FKM2	152852.4	578045.3	
SPA-7	J1FKM3	152857.1	578034.4	
SPA-8	J1FKM4	152857.1	578040.4	
SPA-9	J1FKM5	152857.1	578046.5	
SPA-10	J1FKM6	152862.3	578037.4	
SPA-11	J1FKM7	152862.3	578043.4	
SPA-12	J1FKM8	152867.5	578040.4	
Duplicate [b]	J1FKM9	152685.1	578124.6	
Equipment blank	J1FKN0	NA	NA	ICP metals [a], mercury, SVOA

[a] The expanded list of ICP metals will include antimony, arsenic, barium, beryllium, boron, cadmium, chromium(total), cobalt, copper, lead, manganese, magnesium, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package.
[b] One duplicate soil sample will be collected from each decision unit at a location selected at the project analytical lead's discretion.
[c] The expanded list of IC anions will include bromide, fluoride, and phosphate in the analytical results package.
[d] To preclude holding time issues associated with EPA Method 300.0 for nitrites and nitrates, EPA Method 353 will be performed.

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
IC = ion chromatography
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
WSP = Washington State Plane

Table 3. 116-H-5, Second Re-sample Summary. (2 Pages)

Sample Location	HEIS Sample Number	WSP Coordinates		Sample Analysis
		Northing	Easting	
Deep Zone				
DZ-1	J1HH80	152803.4	578097.5	ICP metals [a], mercury, SVOA, PAH
DZ-2	J1HH81	152803.4	578109.3	
DZ-3	J1HH82	152813.7	578091.6	
DZ-4	J1HH83	152813.7	578103.4	
DZ-7	J1HH84	152823.2	578111.2	
DZ-8	J1HH85	152823.9	578121.1	
Duplicate [b]	J1HH86	152823.9	578121.1	

Table 3. 116-H-5, Second Re-sample Summary. (2 Pages)

Sample Location	HEIS Sample Number	WSP Coordinates		Sample Analysis
		Northing	Easting	
Equipment blank	J1FKN0	NA	NA	ICP metals [a], mercury, SVOA

[a] The expanded list of ICP metals will include antimony, arsenic, barium, beryllium, boron, cadmium, chromium(total), cobalt, copper, lead, manganese, magnesium, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package.

[b] One duplicate soil sample will be collected from each decision unit at a location selected at the project analytical lead's discretion.

HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
SVOA = semivolatile organic analysis
WSP = Washington State Plane

Verification Sample Results

Verification samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods (DOE-RL 2009b). Evaluation of the verification data from the excavation was performed by direct comparison of the statistical or maximum sample results for each COPC against cleanup criteria.

Comparisons of the results for each COPC from the 116-H-5 shallow-zone and deep-zone excavations against site RAGs are summarized in Tables 4 and 5, respectively. Comparisons of the results for each COPC from the 116-H-5 overburden pile and waste staging pile area footprint against site RAGs are summarized in Tables 6 and 7, respectively. Contaminants that were not detected by laboratory analysis are excluded from these tables. Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in samples collected at the decision units, but are not included in the comparison tables, as these isotopes are unrelated to the operational history of the site and were detected below background levels (based on an assumption of secular equilibrium, the background activities for radium-228 and thorium-228 are equal to the statistical background activity of 1.32 pCi/g for thorium-232 provided in *Hanford Site Background: Part 2, Soil Background for Radionuclides* [DOE-RL 1996]). Calculated cleanup levels are not presented in the Cleanup Levels and Risk Calculations Database (Ecology 2009) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COPCs and are also not included in these tables. The complete laboratory results are stored in the ENvironmental REstoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS), and are presented in the 95% UCL calculations (Appendix D).

Table 4. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Shallow-Zone Excavation Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (pCi/g)	Site Lookup Values [a] (pCi/g)			Does the Statistical Result Exceed Lookup Values?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Value for Groundwater Protection	Soil Value for River Protection		
Carbon-14	0.8	8.69	-- [c]	-- [c]	No	--
Nickel-63	3.72	4,013	83	166	No	--
Total beta radiostrontium	0.357	4.5	27.6	55.2	No	--
Tritium [d]	2.08	459	12.6	25.2	No	--
Uranium-233/234	0.0 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--
Uranium-238	0.0 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--
COC/COPC	**Statistical Result [b] (mg/kg)**	**Remedial Action Goals [a] (mg/kg)**			**Does the Statistical Result Exceed RAGs?**	**Does the Statistical Result Pass RESRAD Modeling?**
		Direct Exposure	**Soil Cleanup Level for Groundwater Protection**	**Soil Cleanup Level for River Protection**		
Arsenic	6.53	20 [e]	20 [e]	20 [e]	No	--
Barium	62.4 (<BG)	5,600	200	400	No	--
Beryllium	0.198 (<BG)	10.4 [f]	1.51 [e]	1.51 [e]	No	--
Boron [g]	1.59	7,200	320	-- [h]	No	--
Cadmium [i]	0.0853 (<BG)	13.9 [f]	0.81 [e]	0.81 [e]	No	--
Chromium	12.9 (<BG)	80,000	18.5 [e]	18.5 [e]	No	--
Cobalt	6.30 (<BG)	24	15.7 [e]	-- [h]	No	--
Copper	14.4 (<BG)	2,960	59.2	22.0 [e]	No	--
Hexavalent chromium [g]	0.060	2.1 [f]	4.8	2	No	--
Lead	18.8	353	10.2 [e]	10.2 [e]	Yes	Yes [j]
Manganese	269 (<BG)	3,760	512 [e]	512 [e]	No	--
Mercury	0.019 (<BG)	24	0.33 [e]	0.33 [e]	No	--
Molybdenum [g]	0.273	400	8	-- [h]	No	--
Nickel	11.5 (<BG)	1,600	19.1 [e]	27.4	No	--
Vanadium	48.2 (<BG)	560	85.1 [e]	-- [h]	No	--
Zinc	47.2 (<BG)	24,000	480	67.8 [e]	No	--
Chloride	2.1 (<BG)	--	25,000	--	No	--
Fluoride	0.98 (<BG)	4,800	96	400	No	--
Nitrogen in nitrate	2.44 (<BG)	128,000	1,000	2,000	No	--
Nitrogen in nitrate and nitrite	1.9 (<BG)	128,000	1,000	2,000	No	--
Sulfate	9.2 (<BG)	--	25,000	--	No	--
Acenaphthene	0.00279	4,800	96	129	No	--
Anthracene	0.0076	24,000	240	1,920	No	--
Benzo(a)anthracene	0.0208	1.37	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(a)pyrene	0.0188	0.137	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(b)fluoranthene	0.014	1.37	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(k)fluoranthene	0.00675	1.37	0.015 [k]	0.015 [k]	No	--
Benzo(ghi)perylene [l]	0.0117	2,400	48	192	No	--
Chrysene	0.0236	13.7	0.12	0.1 [k]	No	--

Table 4. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Shallow-Zone Excavation Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Dibenz(a,h)anthracene	0.00275	1.37	0.03 [k]	0.03 [k]	No	--
Fluoranthene	0.0666	3,200	64	18.0	No	--
Fluorene	0.00157	3,200	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.0136	1.37	0.33 [k]	0.33 [k]	No	--
Naphthalene	0.015	1,600	16.0	988	No	--
Phenanthrene [l]	0.0217	24,000	240	1,920	No	--
Pyrene	0.0254	2,400	48	192	No	--
Aroclor-1260	0.00385	0.5	0.017 [k]	0.017 [k]	No	--
4,4'-DDE	0.00045	2.94	0.0257	0.0033 [k]	No	--
TPH-diesel range	2.6	200	200	200	No	--
TPH-diesel range EXT	8.1	200	200	200	No	--
TPH-motor oil (high boiling)	13.352	200	200	200	No	--

[a] Lookup values and RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix D.

[c] No value; because the distribution coefficient value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[d] Tritium samples were taken 15.2 cm (6 in.) below the excavation surface. Where tritium was detected, results were discussed with the lead regulatory agency for appropriate cleanup verification sampling (per TPA-CN-177).

[e] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.12.1 of the RDR/RAWP (DOE-RL 2009b).

[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[g] No Hanford Site-specific or Washington State background value is available.

[h] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[i] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[j] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient of 30 mL/g for lead. The distance to groundwater from the bottom of the shallow-zone excavation is 7.0 m (23.0 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

[k] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

[l] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: benzo(g,h,i)perylene; surrogate: pyrene;
contaminant: phenathrene; surrogate: anthracene.

-- = not available
AWQC = ambient water quality criteria
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 5. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Deep-Zone Excavation Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (pCi/g)	Site Lookup Values [a] (pCi/g)			Does the Statistical Result Exceed Lookup Values?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Value for Groundwater Protection	Soil Value for River Protection		
Carbon-14	0.898	8.69	-- [c]	-- [c]	No	--
Cesium-137	0.161 (<BG)	6.2	1,465	2,930	No	--
Cobalt-60	0.045	1.4	13,900	27,800	No	--
Europium-152	1.37	3.3	-- [c]	-- [c]	No	--
Nickel-63	3.11	4,013	83	166	No	--
Tritium [d]	2.49	459	12.6	25.2	No	--
Uranium-233/234	0.0 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--
Uranium-238	0.0 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--

COC/COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	6.3 (<BG)	20 [e]	20 [e]	20 [e]	No	--
Barium	69.8 (<BG)	5,600	200	400	No	--
Beryllium	0.089 (<BG)	10.4 [f]	1.51 [e]	1.51 [e]	No	--
Boron [g]	1.2	7,200	320	-- [h]	No	--
Cadmium [i]	0.089 (<BG)	13.9 [f]	0.81 [e]	0.81 [e]	No	--
Chromium	11.6 (<BG)	80,000	18.5 [e]	18.5 [e]	No	--
Cobalt	6.2 (<BG)	24	15.7 [e]	-- [h]	No	--
Copper	15.3 (<BG)	2,960	59.2	22.0 [e]	No	--
Lead	18.7	353	10.2 [e]	10.2 [e]	Yes	N/A [j]
Manganese	255 (<BG)	3,760	512 [e]	512 [e]	No	--
Mercury	0.020 (<BG)	24	0.33 [e]	0.33 [e]	No	--
Molybdenum [g]	0.87	400	8	-- [h]	No	--
Nickel	11.7 (<BG)	1,600	19.1 [e]	27.4	No	--
Vanadium	47.0 (<BG)	560	85.1 [e]	-- [h]	No	--
Zinc	43.6 (<BG)	24,000	480	67.8 [e]	No	--
Chloride	17.6 (<BG)	--	25,000	--	No	--
Fluoride	1.3 (<BG)	4,800	96	400	No	--
Nitrogen in nitrate	34	128,000	1,000	2,000	No	--
Nitrogen in nitrate and nitrite	31.3	128,000	1,000	2,000	No	--
Nitrogen in nitrite [g]	0.4	8,000	100	200	No	--
Sulfate	55.2 (<BG)	--	25,000	--	No	--
Anthracene	0.0051	24,000	240	1,920	No	--
Benzo(a)anthracene	0.054	1.37	0.015 [k]	0.015 [k]	Yes	N/A [l]
Benzo(a)pyrene	0.041	0.137	0.015 [k]	0.015 [k]	Yes	N/A [l]
Benzo(b)fluoranthene	0.051	1.37	0.015 [k]	0.015 [k]	Yes	N/A [l]
Benzo(k)fluoranthene	0.030	1.37	0.015 [k]	0.015 [k]	Yes	N/A [l]
Benzo(ghi)perylene [n]	0.032	2,400	48	192	No	--
Bis(2-ethylhexyl)phthalate	0.067	71.4	0.6	0.36	No	--

Table 5. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Deep-Zone Excavation Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Chrysene	0.045	13.7	0.12	0.1 [k]	No	--
Fluoranthene	0.069	3,200	64	18.0	No	--
Indeno(1,2,3-cd)pyrene	0.035	1.37	0.33 [k]	0.33 [k]	No	--
Phenanthrene [m]	0.018	24,000	240	1,920	No	--
Pyrene	0.077	2,400	48	192	No	--
Aroclor-1260	0.00731	0.5	0.017 [k]	0.017 [k]	No	--
4,4'-DDD	0.00212	4.17	0.0365	0.0033 [k]	No	--
4,4'-DDT	0.00310	2.94	0.0257	0.0033 [k]	No	--
TPH-motor oil (high boiling)	33.76	200	200	200	No	--

[a] Lookup values and RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix D.

[c] No value; because the distribution coefficient value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[d] Tritium samples were taken 15.2 cm (6 in.) below the excavation surface. Where tritium was detected, results were discussed with the lead regulatory agency for appropriate cleanup verification sampling (per TPA-CN-177).

[e] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), 1996. The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009).

[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[g] No Hanford Site-specific or Washington State background value is available.

[h] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[i] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[j] The 95% UCL value for lead (18.7 mg/kg) in the deep zone decision unit is within the range of Hanford and Washington statewide background concentrations. Additionally, residual concentrations of lead at the 116-H-5 waste site are consistent with concentrations detected in the riparian zone reference areas as indicated in the *River Corridor Baseline Risk Assessment Report Volume II, Draft C* (DOE-RL 2010).

[k] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

[l] Based on the EPA soil screening equation for migration to groundwater (*Soil Screening Guidance: User's Guide* [EPA 1996]), the predicted concentrations in groundwater due to partitioning of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene between soil and groundwater within the deep zone decision unit are all less than the most restrictive groundwater cleanup levels and also less than ambient water quality criteria. As a result, the residual concentrations of these compounds are predicted to be protective of groundwater and the Columbia River.

[m] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: benzo(g,h,i)perylene; surrogate: pyrene;
contaminant: phenathrene; surrogate: anthracene.

-- = not available
AWQC = ambient water quality criteria
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
DDD = dichlorodiphenyldichloroethane
DDT = dichlorodiphenyltrichloroethane
EPA = U.S. Environmental Protection Agency
N/A = not applicablie
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 6. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Overburden Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (pCi/g)	Site Lookup Values [a] (pCi/g)			Does the Statistical Result Exceed Lookup Values?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Value for Groundwater Protection	Soil Value for River Protection		
Carbon-14	0.866	8.69	-- [c]	-- [c]	No	--
Plutonium-238	0.264	38.8	-- [c]	-- [c]	No	--
Tritium [d]	0.57	459	12.6	25.2	No	--
Uranium-233/234	0.06	1.1 [e]	1.1 [e]	1.1 [e]	No	--
Uranium-238	0.0 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--
COC/COPC	**Statistical Result [b] (mg/kg)**	**Remedial Action Goals [a] (mg/kg)**			**Does the Statistical Result Exceed RAGs?**	**Does the Statistical Result Pass RESRAD Modeling?**
		Direct Exposure	**Soil Cleanup Level for Groundwater Protection**	**Soil Cleanup Level for River Protection**		
Antimony [f]	0.414 (<BG)	32	5 [e]	5 [e]	No	--
Arsenic	5.89 (<BG)	20 [e]	20 [e]	20 [e]	No	--
Barium	53.8 (<BG)	5,600	200	400	No	--
Beryllium	0.174 (<BG)	10.4 [g]	1.51 [e]	1.51 [e]	No	--
Boron [h]	1.43	7,200	320	-- [i]	No	--
Cadmium [f]	0.094 (<BG)	13.9 [g]	0.81 [e]	0.81 [e]	No	--
Chromium	11.5 (<BG)	80,000	18.5 [e]	18.5 [e]	No	--
Cobalt	5.58 (<BG)	24	15.7 [e]	-- [i]	No	--
Copper	13.6 (<BG)	2,960	59.2	22.0 [e]	No	--
Hexavalent chromium [h]	0.16	2.1 [g]	4.8	2	No	--
Lead	17.0	353	10.2 [e]	10.2 [e]	Yes	Yes [j]
Manganese	258 (<BG)	3,760	512 [e]	512 [e]	No	--
Molybdenum [h]	0.318	400	8	-- [i]	No	--
Nickel	10.8 (<BG)	1,600	19.1 [e]	27.4	No	--
Silver	0.156 (<BG)	400	8	0.73 [e]	No	--
Vanadium	44.4 (<BG)	560	85.1 [e]	-- [i]	No	--
Zinc	43.4 (<BG)	24,000	480	67.8 [e]	No	--
Chloride	20.6 (<BG)	--	25,000	--	No	--
Fluoride	0.8 (<BG)	4,800	96	400	No	--
Nitrogen in nitrate	3.0 (<BG)	128,000	1,000	2,000	No	--
Nitrogen in nitrate and nitrite	2.4 (<BG)	128,000	1,000	2,000	No	--
Sulfate	8.2 (<BG)	--	25,000	--	No	--
Acenaphthene	0.0219	4,800	96	129	No	--
Anthracene	0.0584	24,000	240	1,920	No	--
Benzo(a)anthracene	0.0785	1.37	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(a)pyrene	0.0831	0.137	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(b)fluoranthene	0.105	1.37	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(k)fluoranthene	0.0219	1.37	0.015 [k]	0.015 [k]	Yes	Yes [j]
Benzo(ghi)perylene [l]	0.0629	24,000	48	192	No	--
Bis(2-ethylhexyl)phthalate	0.120	71.4	0.6	0.36	No	--
Chrysene	0.113	13.7	0.12	0.1 [k]	Yes	Yes [j]
Dibenz(a,h)anthracene	0.00629	1.37	0.03 [k]	0.03 [k]	No	--

Table 6. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Overburden Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Fluoranthene	0.188	3,200	64	18.0	No	--
Fluorene	0.0323	3,200	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.0834	1.37	0.33 [k]	0.33 [k]	No	--
Naphthalene	0.0251	1,600	16.0	988	No	--
Phenanthrene [l]	0.107	24,000	240	1,920	No	--
Pyrene	0.342	2,400	48	192	No	--
4,4'-DDE	0.00045	2.94	0.0257	0.0033 [k]	No	--
TPH-diesel range	3.2	200	200	200	No	--
TPH-diesel range EXT	6.5	200	200	200	No	--
TPH-motor oil (high boiling)	15.0	200	200	200	No	--

[a] Lookup values and RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix D.

[c] No value; because the distribution coefficient value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[d] Tritium samples were taken 15.2 cm (6 in.) below the excavation surface. Where tritium was detected, results were discussed with the lead regulatory agency for appropriate cleanup verification sampling (per TPA-CN-177).

[e] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), 1996. The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009).

[f] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[g] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[h] No Hanford Site-specific or Washington State background value is available.

[i] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[j] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient of 30 mL/g for lead. The distance to groundwater from the future placement of the overburden within the excavation will be at least 2.0 m (6.6 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

[k] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

[l] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: benzo(g,h,i)perylene; surrogate: pyrene;
contaminant: phenathrene; surrogate: anthracene.

-- = not available
AWQC = ambient water quality criteria
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

Table 7. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Staging Pile Area Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (pCi/g)	Site Lookup Values [a] (pCi/g)			Does the Statistical Result Exceed Lookup Values?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Value for Groundwater Protection	Soil Value for River Protection		
Cesium-137	0.0245 (<BG)	6.2	1,465	2,930	No	--
Technitium-99	0.499	5.8	0.46	0.92	Yes	Yes [c]
Uranium-233/234	0.0 (<BG)	1.1 [d]	1.1 [d]	1.1 [d]	No	--
Uranium-238	0.0	1.1 [d]	1.1 [d]	1.1 [d]	No	--
COC/COPC	**Statistical Result [b] (mg/kg)**	**Remedial Action Goals [a] (mg/kg)**			**Does the Statistical Result Exceed RAGs?**	**Does the Statistical Result Pass RESRAD Modeling?**
		Direct Exposure	**Soil Cleanup Level for Groundwater Protection**	**Soil Cleanup Level for River Protection**		
Arsenic	14.0	20 [d]	20 [d]	20 [d]	No	--
Barium	80.0 (<BG)	5,600	200	400	No	--
Beryllium	0.17 (<BG)	10.4 [e]	1.51 [d]	1.51 [d]	No	--
Boron [f]	2.4	7,200	320	-- [g]	No	--
Cadmium [h]	0.12 (<BG)	13.9 [e]	0.81 [d]	0.81 [d]	No	--
Chromium	11.0 (<BG)	80,000	18.5 [d]	18.5 [d]	No	--
Cobalt	6.9 (<BG)	24	15.7 [d]	-- [g]	No	--
Copper	14.8 (<BG)	2,960	59.2	22.0[d]	No	--
Lead	33.4	353	10.2 [d]	10.2 [d]	Yes	Yes [i]
Manganese	283 (<BG)	3,760	512 [d]	512 [d]	No	--
Mercury	0.014 (<BG)	24	0.33 [d]	0.33 [d]	No	--
Molybdenum [f]	0.33	400	8	-- [g]	No	--
Nickel	10.8 (<BG)	1,600	19.1 [d]	27.4	No	--
Vanadium	48.0 (<BG)	560	85.1 [d]	-- [g]	No	--
Zinc	41.1 (<BG)	24,000	480	67.8 [d]	No	--
Chloride	9.5 (<BG)	--	25,000	--	No	--
Fluoride	1.0 (<BG)	4,800	96	400	No	--
Nitrogen in nitrate	15.3	128,000	1,000	2,000	No	--
Nitrogen in nitrate and nitrite	16.0	128,000	1,000	2,000	No	--
Sulfate	51.6 (<BG)	--	25,000	--	No	--
Acenaphthylene [j]	0.027	4,800	96	129	No	--
Anthracene	0.087	24,000	240	1,920	No	--
Benzo(a)anthracene	0.058	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(a)pyrene	0.0885	0.137	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(b)fluoranthene	0.048	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(k)fluoranthene	0.023	1.37	0.015 [k]	0.015 [k]	Yes	Yes [i]
Benzo(ghi)perylene [j]	0.096	24,00	48	192	No	--
Bis(2ethylhexyl)phthalate	0.121	71.4	0.6	0.36	No	--
Chrysene	0.047	13.7	0.12	0.1 [k]	No	--
Dibenz(a,h)anthracene	0.026	1.37	0.03 [k]	0.03 [k]	No	--
Fluoranthene	0.4	3,200	64	18.0	No	--
Fluorene	0.057	3,200	64	260	No	--

Table 7. Comparison of Statistical Contaminant Concentrations to Action Levels for the 116-H-5 Staging Pile Area Verification Samples. (2 Pages)

COC/COPC	Statistical Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Indeno(1,2,3-cd)pyrene	0.036	1.37	0.33 [k]	0.33 [k]	No	--
Phenanthrene [j]	0.05	24,000	240	1,920	No	--
Pyrene	0.105	2,400	48	192	No	--
Aroclor-1254	0.015	0.5	0.017 [k]	0.017 [k]	No	--
Aroclor-1260	0.010	0.5	0.017 [k]	0.017 [k]	No	--
Total PCBs	0.025	0.5	0.017 [k]	0.017 [k]	No	Yes [i]
4,4'-DDE	0.040	2.94	0.0257	0.0033 [k]	Yes	Yes [i]
4,4'-DDT	0.0053	2.94	0.0257	0.0033 [k]	Yes	Yes [i]
TPH-diesel range	6.149	200	200	200	No	--
TPH-diesel range EXT	19.353	200	200	200	No	--
TPH-motor oil (high boiling)	147.061	200	200	200	No	--

[a] Lookup values and RAGs obtained from the RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix D.

[c] Technitium-99 has a distribution coefficient value of 0 mL/g. Therefore, a site-specific fate and transport evaluation for technetium-99 was developed and discussed in Appendix C. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b) and an evaluation of dilution-attenuation in the saturated zone using the formulas from the EPA *Soil Screening Guidance: User's Guide* (EPA 1996), residual soil concentrations of technetium-99 are predicted to be protective of groundwater and the Columbia River.

[d] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d), 1996. The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009).

[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[f] No Hanford Site-specific or Washington State background value is available.

[g] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[h] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[i] Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentration of lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, total PCBs, 4,4'-DDE, and 4,4'-DDT are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest distribution coefficient of 30 mL/g for lead). The distance to groundwater from the bottom of the staging pile area is 11.0 m (36.3 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
contaminant: acenapthylene; surrogate: acenapthene;
contaminant: benzo(g,h,i)perylene; surrogate: pyrene;
contaminant: phenathrene; surrogate: anthracene.

[k] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996). The cited RDLs are based on EPA-approved analytical methods that may not be available for rapid turnaround analyses. Prior notification and concurrence with the laboratory may be necessary to analyze to meet this RDL. Actual detection limits may differ from any RDL.

-- = not available
AWQC = ambient water quality criteria
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
EPA = U.S. Environmental Protection Agency
PCB = polychlorinated biphenyl
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

DATA EVALUATION

Evaluation of the results listed in Tables 4, 5, 6, and 7 from the verification sampling at the 116-H-5 waste site indicate that no contaminants exceed direct exposure RAGs. Residual contaminant concentrations within the deep zone decision unit were evaluated separately from those within the shallow zone, overburden soil piles, and waste staging area decision units because the deep zone excavation extended into the groundwater table and site specific modeling was necessary to demonstrate protection of groundwater and the Columbia River.

Shallow Zone/Overburden/Staging Pile Data Evaluation

Groundwater and/or the Columbia River protection soil RAGs are exceeded in the shallow zone, overburden, and staging pile areas for lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, 4,4'-DDE, 4,4'-DDT, and total PCBs.

The RESRAD model was run using various distribution coefficient (K_d) values and unsaturated/uncontaminated vadose zone thicknesses to determine minimum K_d values necessary such that a contaminant will not migrate through the soil column to groundwater in 1,000 years (see Appendix C of the RDR/RAWP [DOE/RL-2009b].) For example, the model shows that a contaminant with a K_d of at least 30 mL/g will not migrate more than 1.8 m (6.0 ft) vertically through the vadose zone in 1,000 years. The residual concentrations of lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, 4,4'-DDE, 4,4'-DDT, and total PCBs are not expected to migrate more than 1.8 m (6.0 ft) vertically in 1,000 years (based on the lowest distribution K_d [lead of 30 mL/g] of the contaminants exceeding RAGs). The distance to groundwater from the bottom of these sampling areas is greater than 2.0 m (6.6 ft). Therefore, these 116-H-5 results are predicted to be protective of groundwater and the Columbia River.

Technetium-99 concentrations exceed the soil RAGs for protection of the Columbia River in the waste staging pile area footprint. Technetium-99 has a K_d value of zero (0) mL/g. Therefore, a site-specific fate and transport evaluation for technetium-99 was developed and discussed in the *116-H-5 RESRAD Calculation Brief for Lead & Tc-99 Groundwater and River Protection,* Calculation No. 0100H-CA-V0163, in Appendix C of this remaining sites verification package (RSVP). Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b) and an evaluation of dilution attenuation in the saturated zone using the formulas from the EPA *Soil Screening Guidance: User's Guide* (EPA 1996) in Calculation No. 0100H-CA-V0163, residual soil concentrations of technetium-99 are predicted to be protective of groundwater and the Columbia River.

Deep Zone Data Evaluation

Groundwater and the Columbia River protection soil RAGs are exceeded in the deep zone for lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(k)fluoranthene. Because the deep zone portion of the excavation (Figure 3) extends into groundwater, with approximately 3 m (10 ft) at the base of the excavation existing within historical groundwater fluctuation elevations (114 m [374 ft] to 118 m [378 ft]), EPA soil screening guidance (EPA

1996) was used to perform site specific modeling to evaluate protection of groundwater and the Columbia River.

Based on the EPA soil screening equation for migration to groundwater (EPA 1996), the predicted concentrations in groundwater due to partitioning of residual concentrations of lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(k)fluoranthene between soil and groundwater are all less than the most restrictive groundwater cleanup levels (Table 8). Predicted near river concentrations are also less than ambient water quality criteria. Additionally, the concentrations of lead in the deep zone are within the range of Hanford and Washington statewide background concentrations and are consistent with concentrations detected in the riparian zone reference areas as indicated in the *River Corridor Baseline Risk Assessment Report Volume II, Draft C* (DOE-RL 2010), Figure B-20 of Appendix B and page C7-10 of Appendix C7. As a result, the residual concentrations of lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(k)fluoranthene are predicted to be protective of groundwater and the Columbia River.

Additionally, a review of groundwater monitoring well sample results for the 100-H Area indicate that lead, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(k)fluoranthene are not contaminants present within groundwater. Benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(k)fluoranthene have not been detected in any historical groundwater monitoring well sample results (128 sampling events).

Table 8. Predicted Groundwater and Near River Concentrations Due to Residual Contaminant Concentrations.

Contaminant	Kd (mL/g)	Max. Soil Concentration (mg/kg)	Predicted Groundwater Concentration (ug/L)	Lowest Groundwater Cleanup Level (ug/L)	Predicted Near River Concentration (ug/L)	Ambient Water Quality Criteria (ug/L)
Benzo(a)anthracene	360	0.054	0.0075	0.12	0.00067	0.0028
Benzo(a)pyrene	5,500	0.041	0.00037	0.012	0.000033	0.0028
Benzo(b)fluoranthene	803	0.051	0.0032	0.12	0.00029	0.0028
Benzo(k)fluoranthene	1,230	0.030	0.0012	0.12	0.00011	0.0028
Lead	30	31.3	7.82	15.0	0.705	2.1

WAC Three-Part Test for Nonradionuclides

Shallow Zone/Overburden/Staging Pile Decision Units

A RAG requirement for nonradionuclides is the WAC 173-340-740(7)(e) three-part test. The WAC 173-340 three-part test consists of the following criteria: (1) the cleanup verification 95% UCL value must be less than the cleanup level, (2) no single detection can exceed two times the cleanup criteria, and (3) the percentage of samples exceeding the cleanup criteria must be less than 10% of the data set.

The application of the three-part test for the 116-H-5 waste site is included in the statistical calculations (Appendix D of this RSVP). The results of this evaluation indicate that all residual COPC concentrations pass the three-part test in comparison against applicable RAGs, except for lead, zinc, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene in comparison against the soil RAGs for groundwater and/or river protection in the shallow zone, overburden, and waste staging pile sampling areas. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, zinc benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene are not predicted to migrate more than 1.8 m (6.0 ft) vertically within 1,000 years (based on the contaminant with the lowest K_d of 30 mL/g for lead and zinc). The distance to groundwater from the bottom of these sampling areas is greater than 2.0 m (6.6 ft). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

An additional application of the three-part test is included for the statistical data sets, which default to the maximum because less than half of the data set was detected. The results of this evaluation indicate that all residual COPC concentrations pass the three-part test in comparison against applicable RAGs, except for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, 4,4'-DDE, 4,4'-DDT, and total PCBs in comparison against the soil RAGs for groundwater and/or river protection in one or more sampling areas. However, as described above, based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b), the residual concentrations of these COPCs in the shallow zone, overburden, and staging pile area decision units are not predicted to migrate vertically within 1,000 years (based on the fact that all of these contaminants have K_d values of greater than 80 mL/g). Therefore, residual concentrations of all constituents are predicted to be protective of groundwater and the Columbia River.

Deep Zone Decision Unit

A three-part evaluation was also performed for the statistical and maximum results used in the deep zone decision unit. Table 5 presents the statistical or maximum value associated with each detected constituent. As shown in Table 5, the statistical result for lead exceeds soil RAGs for groundwater and/or river protection. Lead also exceeds greater than 10% of the data for these analytes and has one sample result that exceeds more than twice the lowest RAG value (for groundwater and river protection). However, as described above, the 116-H-5 deep zone lead concentrations are within the range of Hanford and Washington statewide background values and also consistent with concentrations for the Columbia River riparian zone. Additionally, based on the EPA soil screening equation for migration to groundwater (EPA 1996), the predicted concentrations in groundwater due to partitioning of lead between soil and groundwater are all less than the most restrictive groundwater cleanup levels (Table 8). As shown in Table 5, the maximum results for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthen, and benzo(k)fluoranthene exceed soil RAGs for groundwater and/or river protection. Benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene also exceed greater than 10% of the data for these analytes and have one sample result that exceeds more than twice the lowest RAG value (for groundwater and river protection). Based on the EPA soil screening equation for migration to groundwater (EPA 1996), the predicted concentrations in groundwater due to partitioning of these PAH between soil and groundwater are all less than the most restrictive groundwater cleanup levels (Table 8). As described above, the residual concentrations of these compounds are predicted to be protective of groundwater and the Columbia River.

Nonradionuclide Direct Contact Hazard Quotient and Carcinogenic Risk RAGs Attained

Nonradionuclide risk requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1 x 10^{-6}, and a cumulative carcinogenic risk of less than 1 x 10^{-5}. For the 116-H-5 waste site, these risk values were not calculated for constituents that were either not detected or were detected at concentrations below Hanford Site or Washington State background. All individual hazard quotients for noncarcinogenic constituents were less than 1.0. The cumulative hazard quotient for those noncarcinogenic constituents above background or detected levels is 1.2 x 10^{-2}. The individual carcinogenic risk values for the carcinogenic constituents detected above background are less than 1 x 10^{-6}, and the cumulative carcinogenic risk value is 1.0 x 10^{-6}. The 116-H-5 waste site meets the requirements for the direct contact hazard quotient and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2009b).

Nonradionuclide Groundwater Hazard Quotient and Carcinogenic Risk RAGs Attained

Assessment of the risk requirements for the 116-H-5 waste site included calculation of the hazard quotient and carcinogenic (excess cancer) risk values for groundwater protection for nonradionuclides in Appendix D. The requirements include an individual and cumulative hazard quotient of less than 1.0, an individual excess carcinogenic risk of less than 1 x 10^{-6}, and a cumulative excess carcinogenic risk of less than 1 x 10^{-5}. These risk values were conservatively calculated for the entire waste site using the highest value for each COPC from each of the decision units. Risk values were calculated for constituents that were detected at concentrations above Hanford Site or Washington State background values or for which there is no background value. In addition, the distribution coefficients for these contaminants are less than that necessary to show no migration to groundwater in 1,000 years using the generic site RESRAD model discussed in Appendix C of the RDR/RAWP (DOE-RL 2009b). Based on this model and solubility criteria, a K_d of 80 or greater is required to show no predicted migration to groundwater in 1,000 years. Contaminants with a K_d of 80 mL/g are highly adsorbed to soil particles and, even when immersed in water, any migration will be negligible. Lead has a K_d value of 30 mg/kg. However, as previously stated, the concentrations of lead detected in the soil samples within the deep zone are within the range of Hanford site and Washington statewide background and consistent with riparian zone reference concentrations (DOE-RL 2010).

All individual hazard quotients for noncarcinogenic constituents are less than 1.0. The cumulative hazard quotient for the 116-H-5 waste site is 6.5 x 10^{-1}, which is less than 1.0. The highest individual carcinogenic risk value was for aroclor-1254 at 3.4 x 10^{-6}. However, the single detection of aroclor-1254 was in the staging pile area, where only a K_d of 7.2 mL/g is required to show protection of groundwater based on a minimum vadose zone thickness of 10.0 m (33.3 ft). Therefore, aroclor-1254 is included for completeness, but is not necessary to calculate the groundwater excess cancer risk. All other site nonradionuclide COPCs were not detected, or quantified below background levels. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River. The cumulative excess cancer risk value (excluding aroclor-1254) is 5.8 x 10^{-8}. Nonradionuclide risk requirements related to groundwater are met.

Attainment of Radionuclide Direct Exposure RAGs

Table 9 compares the radionuclide cleanup verification results above background from the shallow-zone excavation, deep-zone excavation, overburden, and staging pile area decision units soil samples to direct exposure single radionuclide 15 mrem/year dose-equivalence values and shows the sum of fractions evaluation for comparison of the total radionuclide dose to the RAG of 15 mrem/yr above background. The columns on the left side of the table are the COPCs and the radionuclide activities for the samples, corrected for background, as appropriate. The sixth column presents the single radionuclide 15 mrem/yr dose-equivalence activities, and the last four columns present the radionuclide activities divided by the dose-equivalence activities. As demonstrated by the summation of the fractions for each decision unit, the maximum cumulative dose values contributed by the residual radionuclide populations are predicted to be less than the RAG of 15 mrem/yr above background.

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the verification sampling approach, the field logbooks (WCH 2011a, 2011b), and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications. The DQA for the 116-H-5 waste site established that the data are of the right type, quality, and quantity to support site verification decisions within specified error tolerances. The evaluation verified that the sample design was sufficient for the purpose of clean site verification. The cleanup verification sample analytical data are stored in the (ENRE) project-specific database for data evaluation prior to its archival in the Hanford Environmental Information System (HEIS) and are summarized in Appendix D. The detailed DQA is presented in Appendix E.

SUMMARY FOR INTERIM CLOSURE

The 116-H-5 waste site has been evaluated in accordance with the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2009b). The remaining soils at this site have been sampled, analyzed, and modeled. Verification sampling was performed and the analytical results indicate that the residual concentrations of COPCs at this site meet the RAOs for direct exposure, groundwater protection, and river protection. In accordance with this evaluation, the verification sampling results support a reclassification of the 116-H-5 waste site to Interim Closed Out.

Table 9. Attainment of Radionuclide Direct Exposure Remedial Action Goals (Statistical Samples).

COC/COPC	95% UCL Statistical Values (pCi/g)				Activity Equivalent to 15 mrem/yr Dose [a] (pCi/g)	Fraction			
	SZ Excavation	DZ Excavation	Overburden	SPA		SZ Excavation	DZ Excavation	Overburden	SPA
Carbon-14	0.8	0.898	0.866	--	8.69	0.092	0.10	0.10	--
Cesium-137	--	0.161 (<BG)	--	0.0245 (<BG)	6.2	--	0.026	--	.004
Cobalt-60	--	0.045	--	--	1.4	--	0.032	--	--
Europium-152	--	1.37	--	--	3.3	--	0.42	--	--
Nickel-63	3.72	3.11	--	--	4,013	0.00093	0.00077	--	--
Plutonium-238	--	--	0.264	--	38.8	--	--	0.007	--
Technetium-99	--	--	--	0.499	5.8	--	--	--	0.086
Total beta radiostrontium	0.357	--	--	--	4.5	0.079	--	--	--
Tritium	2.08	2.49	0.57	--	459	0.005	0.005	0.001	--
Uranium-233/234	0.0 (<BG)	0.0 (<BG)	0.06	0.0 (<BG)	1.1	0.0	0.0	0.055	0.0
Uranium-238	0.0 (<BG)	0.0 (<BG)	0.0 (<BG)	0.0	1.1	0.0	0.0	0.0	0.0
					Total	0.177	0.584	0.163	0.09
					Equivalent Dose (mrem/yr)	2.65	8.76	2.45	1.35

[a] Single radionuclide 15 mrem/yr dose-equivalence values and derivation methodology are presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2009b).

-- = not applicable
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
DZ = deep zone
SPA = staging pile area
SZ = shallow zone
UCL = upper confidence limit

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APPENDIX A

ECOLOGICAL RISK COMPARISON TABLE

Table A-1. Contaminants Exceeding Ecological Screening Levels for the 116-H-5 Waste Site[a].

Hazardous Substance		2007 WAC 173-340 Table 749-3			EPA Ecological Soil Screening Levels[b]				Maximum or Statistical Result
		Plants	Soil Biota	Wildlife	Plants	Soil Biota	Avian[c]	Mammalian[c]	
Metals (mg/kg)									
Background									
Antimony	5	5	--	--	--	78	--	0.27	0.414 (<BG)
Arsenic V	6.5[d]	10	60	132	18	--	43	46	14.0
Boron	--	0.5	--	--	--	--	--	--	2.4
Lead	10.2	50	500	118	120	1,700	11	56	33.4
Manganese	512	1,100[e]	--	1,500	220	450	4,300	4,000	283 (<BG)
Vanadium	85.1	2	--	--	--	--	7.8	280	48.2 (<BG)
Zinc	67.8	86[e]	200	360	160	120	46	79	47.2 (<BG)
DDT/DDD/DDE (total)	--	--	--	0.75	--	--	0.093	0.021	0.0453

NOTE: Shaded cells are exceeded by the maximum or the statistical result.

[a] Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors. All exceedances must be evaluated in the context of additional lines of evidence for ecological effects following a baseline risk assessment for the river corridor portion of the Hanford Site, which will include a more complete quantitative ecological risk assessment.

[b] Available on the internet at (www.epa.gov/ecotox/ecossl).

[c] Wildlife.

[d] The Hanford Site background for arsenic is 6.5 mg/kg. An arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the 100 Area RDR/RAWP, DOE/RL-96-17, Rev. 6.

[e] Benchmark replaced by Washington State natural background concentration.

-- = not available
BG = background
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
EPA = U.S. Environmental Protection Agency
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
WAC = *Washington Administrative Code*

APPENDIX B

IN-PROCESS SAMPLES

Table B-1. 116-H-5 Deep Zone and Staging Pile Area Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/2010	0.074	U	0.074	0.062	U	0.062	0.718	U	0.918	0.069	U	0.069	0.086	U	0.086	0.174	U	0.174	0.269	U	0.269
Duplicate of DZ-1	J19YF3	5/18/2010	0.091	U	0.091	0.064	U	0.064	0.903		0.883	0.074	U	0.074	0.085	U	0.085	0.192	U	0.192	0.272	U	0.272
DZ-2	J19YD2	5/18/2010	0.093	U	0.093	0.107	U	0.107	0.203	U	0.85	0.089	U	0.089	0.082	U	0.082	0.24	U	0.24	0.278	U	0.278
DZ-3	J19YD3	5/18/2010	0.367	U	0.367	0.102	U	0.102	1.23		0.881	0.095	U	0.095	0.108	U	0.108	0.23	U	0.23	0.317	U	0.317
DZ-4	J19YD4	5/18/2010	0.329	U	0.329	0.094	U	0.094	0.534	U	0.841	0.078	U	0.078	0.103	U	0.103	0.209	U	0.209	0.249	U	0.249
DZ-5	J19YD5	5/18/2010	0.274	U	0.274	0.083	U	0.083	0.267	U	0.961	0.056	U	0.056	0.068	U	0.068	0.162	U	0.162	0.207	U	0.207
DZ-6	J19YD6	5/18/2010	0.313	U	0.313	0.088	U	0.088	1.15		0.809	0.089	U	0.089	0.087	U	0.087	0.182	U	0.182	0.256	U	0.256
DZ-7	J19YD7	5/18/2010	0.313	U	0.313	0.09	U	0.09	0.725	U	0.83	0.594		0.087	0.145		0.076	2.28		0.2	0.284	U	0.284
DZ-8	J19YD8	5/18/2010	0.094	U	0.094	0.064	U	0.064	0.513	U	0.881	0.071	U	0.071	0.086	U	0.086	0.198	U	0.198	0.291	U	0.291
DZ-9	J19YD9	5/18/2010	0.117	U	0.117	0.123	U	0.123	0.581	U	0.86	0.114	U	0.114	0.095	U	0.095	0.28	U	0.28	0.34	U	0.34
DZ-10	J19YF0	5/18/2010	0.151	U	0.151	0.055	U	0.055	0.509	U	0.8	0.055	U	0.055	0.072	U	0.072	0.181	U	0.181	0.253	U	0.253
DZ-11	J19YF1	5/18/2010	0.169	U	0.169	0.062	U	0.062	1.41		0.901	0.066	U	0.066	0.055	U	0.055	0.182	U	0.182	0.197	U	0.197
DZ-12	J19YF2	5/18/2010	0.305	U	0.305	0.096	U	0.096	0.766	U	0.9	0.078	U	0.078	0.086	U	0.086	0.183	U	0.183	0.294	U	0.294
SPA-8	J19YJ4	5/17/2010	0.321	U	0.321	0.098	U	0.098	0.039	U	0.51	0.118	U	0.118	0.067	U	0.067	0.181	U	0.181	0.223	U	0.223
Duplicate of SPA-8	J19YJ9	5/17/2010	0.035	U	0.035	0.026	U	0.026	-0.064	U	0.497	0.136		0.036	0.031	U	0.031	0.073	U	0.073	0.089	U	0.089
SPA-1	J19YH7	5/17/2010	0.124	U	0.124	0.054	U	0.054	-0.091	U	0.496	0.065	U	0.065	0.062	U	0.062	0.164	U	0.164	0.193	U	0.193
SPA-2	J19YH8	5/17/2010	0.12	U	0.12	0.121	U	0.121	-0.085	U	0.534	0.253	U	0.253	0.112	U	0.112	0.291	U	0.291	0.395	U	0.395
SPA-3	J19YH9	5/17/2010	0.107	U	0.107	0.083	U	0.083	0.136	U	0.51	0.234		0.092	0.094	U	0.094	0.255	U	0.255	0.298	U	0.298
SPA-4	J19YJ0	5/17/2010	0.178	U	0.178	0.079	U	0.079	-0.029	U	0.489	0.1	U	0.1	0.057	U	0.057	0.186	U	0.186	0.2	U	0.2
SPA-5	J19YJ1	5/17/2010	0.159	U	0.159	0.067	U	0.067	-0.014	U	0.525	0.11		0.077	0.078	U	0.078	0.204	U	0.204	0.25	U	0.25
SPA-6	J19YJ2	5/17/2010	0.128	U	0.128	0.13	U	0.13	0.145	U	0.519	0.307		0.132	0.114	U	0.114	0.287	U	0.287	0.355	U	0.355
SPA-7	J19YJ3	5/17/2010	0.085	U	0.085	0.067	U	0.067	-0.038	U	0.507	0.069	U	0.069	0.081	U	0.081	0.197	U	0.197	0.253	U	0.253
SPA-9	J19YJ5	5/17/2010	0.089	U	0.089	0.092	U	0.092	0.048	U	0.515	0.238		0.09	0.084	U	0.084	0.196	U	0.196	0.277	U	0.277
SPA-10	J19YJ6	5/17/2010	0.115	U	0.115	0.116	U	0.116	0.141	U	0.502	0.333		0.119	0.092	U	0.092	0.272	U	0.272	0.325	U	0.325
SPA-11	J19YJ7	5/17/2010	0.052	U	0.052	0.023	U	0.023	-0.003	U	0.522	0.056		0.028	0.025	U	0.025	0.064	U	0.064	0.085	U	0.085
SPA-12	J19YJ8	5/17/2010	0.045	U	0.045	0.044	U	0.044	-0.046	U	0.503	0.089		0.048	0.039	U	0.039	0.104	U	0.104	0.128	U	0.128

Acronyms and notes apply to all of the tables in this appendix

B = analyte detected below PQL; therefore result is estimated

D = diluted

J = estimate

MDA = miniumum detectable activity

PQL = practical quantitation limit

Q = qualifier

U = undetected

Table B-1. 116-H-5 Deep Zone and Staging Pile Area Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Europium-155			Nickel-63			Plutonium-238			Plutonium-239/240			Potassium-40			Radium-226			Radium-228		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/2010	0.135	U	0.135	-0.528	U	2.97	0.005	U	0.089	0.01	U	0.07	15.1		0.78	0.502		0.135	0.8		0.302
Duplicate of DZ-1	J19YF3	5/18/2010	0.14	U	0.14	0.44	U	2.98	0.051	U	0.194	0	U	0.194	15.1		0.852	0.576		0.128	0.539		0.333
DZ-2	J19YD2	5/18/2010	0.174	U	0.174	-0.578	U	3.03	-0.005	U	0.091	-0.01	U	0.057	9.42		0.79	0.425		0.165	0.349		0.338
DZ-3	J19YD3	5/18/2010	0.207	U	0.207	0.524	U	3.17	-0.027	U	0.087	-0.005	U	0.052	12.4		0.859	0.42		0.168	0.739		0.232
DZ-4	J19YD4	5/18/2010	0.195	U	0.195	-0.498	U	3.02	-0.005	U	0.098	0	U	0.044	10.9		1.35	0.437		0.155	0.654		0.349
DZ-5	J19YD5	5/18/2010	0.184	U	0.184	0.087	U	3.44	0.017	U	0.111	-0.006	U	0.071	11.5		0.709	0.495		0.126	0.828		0.258
DZ-6	J19YD6	5/18/2010	0.169	U	0.169	-0.158	U	3.11	0.014	U	0.142	0.007	U	0.055	11		1.05	0.505		0.154	0.571		0.314
DZ-7	J19YD7	5/18/2010	0.245	U	0.245	13.2		3.19	0.006	U	0.114	0.028	U	0.053	12		0.622	0.417		0.166	0.402		0.364
DZ-8	J19YD8	5/18/2010	0.145	U	0.145	-0.232	U	3.05	0.005	U	0.047	-0.005	U	0.037	14.2		0.809	0.586		0.142	0.434		0.393
DZ-9	J19YD9	5/18/2010	0.256	U	0.256	0	U	2.96	-0.017	U	0.063	-0.006	U	0.044	13.2		1.06	0.619		0.24	0.98		0.438
DZ-10	J19YF0	5/18/2010	0.141	U	0.141	0.914	U	3	0	U	0.063	0	U	0.039	12.4		0.609	0.402		0.111	0.551		0.293
DZ-11	J19YF1	5/18/2010	0.17	U	0.17	1.5	U	2.8	0.057	U	0.275	0.086	U	0.219	13		0.588	0.483		0.101	0.641		0.239
DZ-12	J19YF2	5/18/2010	0.194	U	0.194	1.4	U	2.75	0.082	U	0.392	0.041	U	0.313	11.5		0.61	0.49		0.15	0.373	U	0.377
SPA-8	J19YJ4	5/17/2010	0.191	U	0.191	1.15	U	3.63	-0.075	U	0.357	0	U	0.285	12.3		0.628	0.506		0.14	0.5		0.255
Duplicate of SPA-8	J19YJ9	5/17/2010	0.057	U	0.057	1.23	U	3	0	U	0.268	0	U	0.267	15.7		0.301	0.567		0.057	0.829		0.137
SPA-1	J19YH7	5/17/2010	0.128	U	0.128	0.588	U	3.18	0.056	U	0.269	0.028	U	0.215	12.7		0.574	0.404		0.095	0.608		0.231
SPA-2	J19YH8	5/17/2010	0.222	U	0.222	-0.083	U	3.15	0.033	U	0.256	0.033	U	0.255	14.8		1.08	0.505		0.239	0.818		0.451
SPA-3	J19YH9	5/17/2010	0.169	U	0.169	1.58	U	3.42	-0.039	U	0.376	-0.039	U	0.3	15.6		1.11	0.689		0.168	0.842		0.466
SPA-4	J19YJ0	5/17/2010	0.177	U	0.177	0.82	U	3.1	0	U	0.347	0.108	U	0.277	12.4		0.709	0.39		0.116	0.557		0.282
SPA-5	J19YJ1	5/17/2010	0.164	U	0.164	1.2	U	3.02	0	U	0.373	0.049	U	0.373	12.3		0.885	0.565		0.109	1.03		0.28
SPA-6	J19YJ2	5/17/2010	0.248	U	0.248	1.32	U	3.13	0	U	0.358	0.032	U	0.248	12.3		1.09	0.494		0.205	1.05		0.518
SPA-7	J19YJ3	5/17/2010	0.146	U	0.146	1.08	U	3.14	0.124	U	0.396	-0.041	U	0.316	15.6		0.834	0.395		0.138	0.775		0.256
SPA-9	J19YJ5	5/17/2010	0.188	U	0.188	0.856	U	3.08	0.074	U	0.354	0.037	U	0.283	11.8		0.881	0.37		0.159	0.736		0.363
SPA-10	J19YJ6	5/17/2010	0.251	U	0.251	1.6	U	3.11	-0.04	U	0.302	0	U	0.302	14.1		1.07	0.832		0.213	1.06		0.474
SPA-11	J19YJ7	5/17/2010	0.054	U	0.054	0.732	U	3.08	-0.032	U	0.248	0	U	0.247	12.9		0.258	0.496		0.048	0.676		0.098
SPA-12	J19YJ8	5/17/2010	0.084	U	0.084	0.22	U	3.33	0.034	U	0.258	0	U	0.258	14.6		0.43	0.551		0.085	0.75		0.178

Table B-1. 116-H-5 Deep Zone and Staging Pile Area Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Silver-108			Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total Beta			Tritium			Uranium-233/234		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/2010	0.047	U	0.047	0.13	U	0.382	0.668		0.086	0.8		0.302	-0.051	U	0.226	4.53		2.71	0.766		0.279
Duplicate of DZ-1	J19YF3	5/18/2010	0.052	U	0.052	-0.086	U	0.39	0.731		0.086	0.539		0.333	-0.084	U	0.217	0.202	U	3.1	0.567		0.181
DZ-2	J19YD2	5/18/2010	0.061	U	0.061	0.175	U	0.434	0.505		0.105	0.349		0.338	-0.06	U	0.291	2.13	U	2.6	0.318		0.244
DZ-3	J19YD3	5/18/2010	0.072	U	0.072	0.289	U	0.424	0.876		0.163	0.739		0.232	0.194	U	0.326	1.79	U	2.58	0.38		0.242
DZ-4	J19YD4	5/18/2010	0.06	U	0.06	0.166	U	0.375	0.586		0.147	0.654		0.349	0.059	U	0.257	2.55	U	2.64	0.395		0.202
DZ-5	J19YD5	5/18/2010	0.048	U	0.048	0.146	U	0.492	0.586		0.087	0.828		0.258	0.071	U	0.311	1.72	U	2.76	0.87		0.215
DZ-6	J19YD6	5/18/2010	0.055	U	0.055	0.194	U	0.384	0.544		0.091	0.571		0.314	0.051	U	0.244	2.32	U	2.55	0.702		0.244
DZ-7	J19YD7	5/18/2010	0.054	U	0.054	0.114	U	0.37	0.613		0.09	0.402		0.364	-0.065	U	0.285	4.34		2.59	0.648		0.236
DZ-8	J19YD8	5/18/2010	0.052	U	0.052	0.227	U	0.442	0.691		0.088	0.434		0.393	0.012	U	0.266	1.06	U	2.65	0.43		0.206
DZ-9	J19YD9	5/18/2010	0.082	U	0.082	0.15	U	0.387	0.557		0.147	0.98		0.438	-0.11	U	0.324	1.91	U	2.62	0.709		0.209
DZ-10	J19YF0	5/18/2010	0.047	U	0.047	-0.013	U	0.408	0.607		0.075	0.551		0.293	-0.053	U	0.272	2.53		2.53	0.594		0.182
DZ-11	J19YF1	5/18/2010	0.047	U	0.047	-0.029	U	0.385	0.75		0.126	0.641		0.239	-0.02	U	0.228	1.06	U	2.96	0.371		0.149
DZ-12	J19YF2	5/18/2010	0.066	U	0.066	0.012	U	0.4	0.615		0.175	0.373	U	0.377	0.006	U	0.207	0.297	U	3.03	0.553		0.184
SPA-8	J19YJ4	5/17/2010	0.054	U	0.054	0.012	U	0.42	0.573		0.079	0.5		0.255	0.122	U	0.327	-0.83	U	7.52	0.85		0.21
Duplicate of SPA-8	J19YJ9	5/17/2010	0.019	U	0.019	0.028	U	0.404	0.831		0.036	0.829		0.137	0.013	U	0.296	0.457	U	7.26	0.33		0.194
SPA-1	J19YH7	5/17/2010	0.046	U	0.046	0.048	U	0.453	0.455		0.064	0.608		0.231	0.013	U	0.289	1.42	U	7.5	0.236		0.164
SPA-2	J19YH8	5/17/2010	0.08	U	0.08	0.13	U	0.462	0.525		0.217	0.818		0.451	0.007	U	0.313	-0.359	U	7.59	0.552		0.264
SPA-3	J19YH9	5/17/2010	0.054	U	0.054	0.181	U	0.42	1.04		0.108	0.842		0.466	0.053	U	0.265	-2.56	U	7.38	0.32		0.204
SPA-4	J19YJ0	5/17/2010	0.051	U	0.051	0.082	U	0.418	0.564		0.094	0.557		0.282	0.088	U	0.325	-1.24	U	7.16	0.366		0.28
SPA-5	J19YJ1	5/17/2010	0.053	U	0.053	0.086	U	0.399	0.927		0.137	1.03		0.28	-0.028	U	0.244	-2.27	U	8.46	0.488		0.208
SPA-6	J19YJ2	5/17/2010	0.092	U	0.092	0.195	U	0.428	0.687		0.134	1.05		0.518	-0.038	U	0.317	2.46	U	7.44	0.474		0.202
SPA-7	J19YJ3	5/17/2010	0.047	U	0.047	0.034	U	0.435	0.697		0.097	0.775		0.256	-0.067	U	0.314	-1.83	U	8.27	1.01		0.257
SPA-9	J19YJ5	5/17/2010	0.056	U	0.056	0.086	U	0.417	0.693		0.098	0.736		0.363	0.033	U	0.29	1.25	U	8.79	0.497		0.055
SPA-10	J19YJ6	5/17/2010	0.082	U	0.082	0.144	U	0.426	0.666		0.154	1.06		0.474	0.004	U	0.328	-1.06	U	7.45	0.436		0.052
SPA-11	J19YJ7	5/17/2010	0.017	U	0.017	0.056	U	0.444	0.7		0.031	0.676		0.098	0.074	U	0.332	-1.64	U	7.42	0.496		0.158
SPA-12	J19YJ8	5/17/2010	0.032	U	0.032	-0.015	U	0.43	0.756		0.057	0.75		0.178	0.049	U	0.364	-1.72	U	7.77	0.692		0.165

Table B-1. 116-H-5 Deep Zone and Staging Pile Area Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/2010	0	U	0.338	0.336	U	0.336	0.62		0.279	7.78	U	7.78
Duplicate of DZ-1	J19YF3	5/18/2010	0	U	0.219	0.372	U	0.372	0.543		0.181	9.63	U	9.63
DZ-2	J19YD2	5/18/2010	0	U	0.295	0.42	U	0.42	0.51		0.244	10	U	10
DZ-3	J19YD3	5/18/2010	0	U	0.293	0.467	U	0.467	0.57		0.242	11.8	U	11.8
DZ-4	J19YD4	5/18/2010	0.064	U	0.244	0.391	U	0.391	0.501		0.202	11.1	U	11.1
DZ-5	J19YD5	5/18/2010	0.136	U	0.26	0.355	U	0.355	0.533		0.215	7.77	U	7.77
DZ-6	J19YD6	5/18/2010	0.039	U	0.296	0.34	U	0.34	0.766		0.244	9.78	U	9.78
DZ-7	J19YD7	5/18/2010	0	U	0.286	0.432	U	0.432	0.833		0.236	9.63	U	9.63
DZ-8	J19YD8	5/18/2010	0.033	U	0.249	0.34	U	0.34	0.349		0.206	10.5	U	10.5
DZ-9	J19YD9	5/18/2010	0.066	U	0.253	0.598	U	0.598	0.546		0.209	12.7	U	12.7
DZ-10	J19YF0	5/18/2010	0	U	0.22	0.326	U	0.326	0.57		0.182	6.66	U	6.66
DZ-11	J19YF1	5/18/2010	0	U	0.181	0.371	U	0.371	0.488		0.149	7.59	U	7.59
DZ-12	J19YF2	5/18/2010	0	U	0.223	0.39	U	0.39	0.481		0.184	9.86	U	9.86
SPA-8	J19YJ4	5/17/2010	0.033	U	0.254	0.413	U	0.413	0.302		0.21	8.54	U	8.54
Duplicate of SPA-8	J19YJ9	5/17/2010	0.031	U	0.235	0.148	U	0.148	0.635		0.194	4.79	U	4.79
SPA-1	J19YH7	5/17/2010	0.052	U	0.198	0.302	U	0.302	0.279		0.164	7.01	U	7.01
SPA-2	J19YH8	5/17/2010	0	U	0.32	0.529	U	0.529	0.345		0.264	12.6	U	12.6
SPA-3	J19YH9	5/17/2010	0.065	U	0.247	0.421	U	0.421	0.427		0.204	10.4	U	10.4
SPA-4	J19YJ0	5/17/2010	0.133	U	0.339	0.37	U	0.37	0.44		0.28	7.81	U	7.81
SPA-5	J19YJ1	5/17/2010	0.033	U	0.251	0.359	U	0.359	0.38		0.208	8.44	U	8.44
SPA-6	J19YJ2	5/17/2010	0.064	U	0.244	0.576	U	0.576	0.791		0.202	12.5	U	12.5
SPA-7	J19YJ3	5/17/2010	0		0.312	0.373	U	0.373	0.774		0.257	8.73	U	8.73
SPA-9	J19YJ5	5/17/2010	0.024	U	0.044	0.38	U	0.38	0.491		0.036	9.02	U	9.02
SPA-10	J19YJ6	5/17/2010	0.005	U	0.039	0.551	U	0.551	0.428		0.047	11.4	U	11.4
SPA-11	J19YJ7	5/17/2010	0.05	U	0.191	0.145	U	0.145	0.393		0.158	2.76	U	2.76
SPA-12	J19YJ8	5/17/2010	0	U	0.2	0.203	U	0.203	0.346		0.165	4.64	U	4.64

Table B-2. 116-H-5 Deep Zone and Staging Pile Area Inorganic Data Results. (5 Pages)

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/2010	5570		14.7	0.737	U	0.74	4.46		0.74	42.1		0.37	0.164		0.15	1.1	B	1.47
Duplicate of DZ-1	J19YF3	5/18/2010	5830		18.6	0.929	U	0.93	5.3		0.93	45.4		0.47	0.164	B	0.19	1.15	B	1.86
DZ-2	J19YD2	5/18/2010	5380		20.7	1.03	U	1.03	3.41		1.03	67.9		0.52	0.147	B	0.21	0.801	B	2.07
DZ-3	J19YD3	5/18/2010	6880		21	1.05	U	1.05	3.95		1.05	61.4		0.52	0.2	B	0.21	1.6	B	2.1
DZ-4	J19YD4	5/18/2010	6780		13.9	0.696	U	0.7	5.3		0.7	60.8		0.35	0.185		0.14	1.44		1.39
DZ-5	J19YD5	5/18/2010	7410		15.8	0.788	U	0.79	17.7		0.79	57.6		0.39	0.211		0.16	1.22	B	1.58
DZ-6	J19YD6	5/18/2010	6400		14.3	0.262	B	0.71	5.99		0.71	47.7		0.36	0.176		0.14	1.08	B	1.43
DZ-7	J19YD7	5/18/2010	7710		15.9	0.453	B	0.79	8.1		0.79	57.1		0.4	0.199		0.16	1.46	B	1.59
DZ-8	J19YD8	5/18/2010	5390		19.3	0.967	U	0.97	3.23		0.97	56.6		0.48	0.147	B	0.19	0.888	B	1.93
DZ-9	J19YD9	5/18/2010	5790		17.4	0.87	U	0.87	5.1		0.87	50.7		0.44	0.174		0.17	1.25	B	1.74
DZ-10	J19YF0	5/18/2010	5250		15	0.748	U	0.75	4.68		0.75	59.7		0.37	0.157		0.15	0.902	B	1.5
DZ-11	J19YF1	5/18/2010	6470		16.8	0.842	U	0.84	5.85		0.84	58.2		0.42	0.191		0.17	1.18	B	1.68
DZ-12	J19YF2	5/18/2010	6360		15.6	0.78	U	0.78	5.39		0.78	51.9		0.39	0.179		0.16	1.07	B	1.56
SPA-8	J19YJ4	5/17/2010	7140		13.3	0.346	B	0.66	7.32		0.66	66.8		0.33	0.21		0.13	3.26		1.33
Duplicate of SPA-8	J19YJ9	5/17/2010	7420		16.3	0.813	U	0.81	7.94		0.81	69.3		0.41	0.229		0.16	3.47		1.63
SPA-1	J19YH7	5/17/2010	5600		17	0.297	B	0.85	2.41		0.85	42.1		0.43	0.142	B	0.17	1.26	B	1.7
SPA-2	J19YH8	5/17/2010	9000		14.3	0.29	B	0.72	4.14		0.72	75.1		0.36	0.269		0.14	2.11		1.43
SPA-3	J19YH9	5/17/2010	9700		16.2	0.331	B	0.81	4.38		0.81	84		0.41	0.293		0.16	2.25		1.62
SPA-4	J19YJ0	5/17/2010	6850		12.9	0.288	B	0.64	2.53		0.64	54.6		0.32	0.181		0.13	1.31		1.29
SPA-5	J19YJ1	5/17/2010	8470		16.2	0.286	B	0.81	4.07		0.81	74.4		0.41	0.26		0.16	2.16		1.62
SPA-6	J19YJ2	5/17/2010	6710		15.5	0.334	B	0.78	5.25		0.78	82.3		0.39	0.226		0.16	6.47		1.55
SPA-7	J19YJ3	5/17/2010	7450		15	0.329	B	0.75	6.25		0.75	63.2		0.37	0.196		0.15	2.55		1.5
SPA-9	J19YJ5	5/17/2010	7060		12.6	0.281	B	0.63	6.11		0.63	76.8		0.31	0.216		0.13	4.16		1.26
SPA-10	J19YJ6	5/17/2010	6080		14	0.253	B	0.7	5.96		0.7	77.5		0.35	0.19		0.14	4.84		1.4
SPA-11	J19YJ7	5/17/2010	7710		14	0.393	B	0.7	8.71		0.7	66.7		0.35	0.227		0.14	3.03		1.4
SPA-12	J19YJ8	5/17/2010	7290		12.7	0.299	B	0.64	14.2		0.64	69.5		0.32	0.218		0.13	3.32		1.27

Table B-2. 116-H-5 Deep Zone and Staging Pile Area Inorganic Data Results. (5 Pages)

Sample Location	HEIS Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Hexavalent		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/2010	0.057	B	0.18	5100		14.7	8.71		0.74	5.03		2.21	12.8		1.47	0.21	U	0.21
Duplicate of DZ-1	J19YF3	5/18/2010	0.097	B	0.23	5360		18.6	9.56		0.93	5.58		2.79	12.7		1.86	0.21	U	0.21
DZ-2	J19YD2	5/18/2010	0.088	B	0.26	5120		20.7	10.7		1.03	7.58		3.1	13.6		2.07	0.21	U	0.21
DZ-3	J19YD3	5/18/2010	0.262	U	0.26	5660		21	15.6		1.05	5.96		3.15	12.8		2.1	0.21	U	0.21
DZ-4	J19YD4	5/18/2010	0.061	B	0.17	6420		13.9	11.5		0.7	5.77		2.09	13.4		1.39	0.21	U	0.21
DZ-5	J19YD5	5/18/2010	0.069	B	0.2	5060		15.8	11.3		0.79	5.8		2.36	13.5		1.58	0.21	U	0.21
DZ-6	J19YD6	5/18/2010	0.048	B	0.18	5340		14.3	11.1		0.71	5.47		2.14	13.8		1.43	0.21	U	0.21
DZ-7	J19YD7	5/18/2010	0.13	B	0.2	7540		15.9	19.9		0.79	5.88		2.38	14.9		1.59	0.21	U	0.21
DZ-8	J19YD8	5/18/2010	0.065	B	0.24	4450		19.3	8.55		0.97	4.97		2.9	11.9		1.93	0.21	U	0.21
DZ-9	J19YD9	5/18/2010	0.058	B	0.22	4660		17.4	9.92		0.87	5.87		2.61	13.4		1.74	0.21	U	0.21
DZ-10	J19YF0	5/18/2010	0.055	B	0.19	4590		15	7.37		0.75	6.19		2.25	14.1		1.5	0.21	U	0.21
DZ-11	J19YF1	5/18/2010	0.132	B	0.21	5760		16.8	12		0.84	5.35		2.53	14.9		1.68	0.21	U	0.21
DZ-12	J19YF2	5/18/2010	0.115	B	0.2	5590		15.6	10.3		0.78	5.36		2.34	13.6		1.56	0.21	U	0.21
SPA-8	J19YJ4	5/17/2010	0.082	B	0.17	4390		13.3	11.2		0.66	5.67		1.99	13.6		1.33	0.2	U	0.2
Duplicate of SPA-8	J19YJ9	5/17/2010	0.092	B	0.2	4500		16.3	11.1		0.81	5.96		2.44	14.8		1.63	0.2	U	0.2
SPA-1	J19YH7	5/17/2010	0.212	U	0.21	6170		17	9.89		0.85	4.98		2.55	11.6		1.7	0.2	U	0.2
SPA-2	J19YH8	5/17/2010	0.05	B	0.18	4580		14.3	12.3		0.72	6.44		2.15	13.3		1.43	0.2	U	0.2
SPA-3	J19YH9	5/17/2010	0.05	B	0.2	4270		16.2	12.2		0.81	6.86		2.43	13.6		1.62	0.2	U	0.2
SPA-4	J19YJ0	5/17/2010	0.035	B	0.16	4450		12.9	10.7		0.64	5.44		1.93	12.2		1.29	0.2	U	0.2
SPA-5	J19YJ1	5/17/2010	0.056	B	0.2	3700		16.2	11.1		0.81	6.09		2.43	12.1		1.62	0.2	U	0.2
SPA-6	J19YJ2	5/17/2010	0.141	B	0.19	4690		15.5	10.1		0.78	5.34		2.33	15.3		1.55	0.2	U	0.2
SPA-7	J19YJ3	5/17/2010	0.051	B	0.19	6240		15	13		0.75	5.83		2.24	13.6		1.5	0.2	U	0.2
SPA-9	J19YJ5	5/17/2010	0.104	B	0.16	4430		12.6	11.5		0.63	5.7		1.88	14.1		1.26	0.2	U	0.2
SPA-10	J19YJ6	5/17/2010	0.105	B	0.18	3950		14	10.1		0.7	4.84		2.1	14.6		1.4	0.2	U	0.2
SPA-11	J19YJ7	5/17/2010	0.083	B	0.18	4480		14	11.7		0.7	5.87		2.1	12.9		1.4	0.2	U	0.2
SPA-12	J19YJ8	5/17/2010	0.091	B	0.16	5100		12.7	11.3		0.64	6.05		1.91	13.3		1.27	0.2	U	0.2

Table B-2. 116-H-5 Deep Zone and Staging Pile Area Inorganic Data Results. (5 Pages)

Sample Location	HEIS Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Molybdenum		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/2010	15500		14.7	12.5		0.74	3430		3.68	220		0.74	0.011	B	0.03	0.213	B	0.74
Duplicate of DZ-1	J19YF3	5/18/2010	16200		18.6	14.3		0.93	3950		4.65	246		0.93	0.027		0.03	0.346	B	0.93
DZ-2	J19YD2	5/18/2010	20400		20.7	7.09		1.03	4290		5.17	269		1.03	0.011	B	0.03	0.288	B	1.03
DZ-3	J19YD3	5/18/2010	18600		21	7.83		1.05	4410		5.24	259		1.05	0.012	B	0.03	0.315	B	1.05
DZ-4	J19YD4	5/18/2010	17500		13.9	13.1		0.7	4250		3.48	264		0.7	0.01	B	0.03	0.299	B	0.7
DZ-5	J19YD5	5/18/2010	17800		15.8	58.2		0.79	4230		3.94	274		0.79	0.015	B	0.03	0.202	B	0.79
DZ-6	J19YD6	5/18/2010	16500		14.3	15.5		0.71	4120		3.56	251		0.71	0.009	B	0.03	0.264	B	0.71
DZ-7	J19YD7	5/18/2010	18300		15.9	22.8		0.79	4270		3.97	283		0.79	0.159		0.03	0.32	B	0.79
DZ-8	J19YD8	5/18/2010	15500		19.3	7.78		0.97	3270		4.83	230		0.97	0.012	B	0.03	0.248	B	0.97
DZ-9	J19YD9	5/18/2010	17800		17.4	14.4		0.87	4120		4.35	247		0.87	0.025	U	0.03	0.367	B	0.87
DZ-10	J19YF0	5/18/2010	17000		15	12.7		0.75	3130		3.74	257		0.75	0.026	U	0.03	0.239	B	0.75
DZ-11	J19YF1	5/18/2010	17400		16.8	15.8		0.84	3970		4.21	262		0.84	0.026	U	0.03	0.617	B	0.84
DZ-12	J19YF2	5/18/2010	17000		15.6	14.7		0.78	4250		3.9	251		0.78	0.01	B	0.03	0.262	B	0.78
SPA-8	J19YJ4	5/17/2010	17300		13.3	56.5		0.66	3910		3.32	262		0.66	0.028	U	0.03	0.364	B	0.66
Duplicate of SPA-8	J19YJ9	5/17/2010	17800		16.3	59.8		0.81	3960		4.06	271		0.81	0.026	U	0.03	0.401	B	0.81
SPA-1	J19YH7	5/17/2010	15400		17	4.63		0.85	3980		4.25	232		0.85	0.026	U	0.03	0.318	B	0.85
SPA-2	J19YH8	5/17/2010	19900		14.3	9.7		0.72	4190		3.59	310		0.72	0.027	U	0.03	0.374	B	0.72
SPA-3	J19YH9	5/17/2010	20600		16.2	9.45		0.81	4330		4.06	330		0.81	0.028	U	0.03	0.331	B	0.81
SPA-4	J19YJ0	5/17/2010	16900		12.9	3.61		0.64	3880		3.22	260		0.64	0.024	U	0.02	0.282	B	0.64
SPA-5	J19YJ1	5/17/2010	18000		16.2	9.15		0.81	3850		4.05	289		0.81	0.025	U	0.03	0.338	B	0.81
SPA-6	J19YJ2	5/17/2010	16600		15.5	32.9		0.78	3520		3.88	247		0.78	0.023	B	0.03	0.495	B	0.78
SPA-7	J19YJ3	5/17/2010	17500		15	19.3		0.75	4410		3.74	259		0.75	0.024	U	0.02	0.344	B	0.75
SPA-9	J19YJ5	5/17/2010	17000		12.6	43.4		0.63	3890		3.14	257		0.63	0.015	B	0.03	0.348	B	0.63
SPA-10	J19YJ6	5/17/2010	15300		14	42.8		0.7	3460		3.49	226		0.7	0.057		0.03	0.377	B	0.7
SPA-11	J19YJ7	5/17/2010	18300		14	65.6		0.7	4190		3.51	275		0.7	0.025	U	0.03	0.304	B	0.7
SPA-12	J19YJ8	5/17/2010	17800		12.7	87.1		0.64	3800		3.18	263		0.64	0.026	U	0.03	0.312	B	0.64

Table B-2. 116-H-5 Deep Zone and Staging Pile Area Inorganic Data Results. (5 Pages)

Sample Location	HEIS Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/2010	7.68		1.84	769		73.7	0.221	U	0.22	496		4.42	0.737	U	0.74	178		36.8
Duplicate of DZ-1	J19YF3	5/18/2010	8.62		2.32	802		92.9	0.279	U	0.28	563		5.57	0.929	U	0.93	174		46.5
DZ-2	J19YD2	5/18/2010	12.1		2.58	658		103	0.31	U	0.31	742		6.2	1.03	U	1.03	285		51.7
DZ-3	J19YD3	5/18/2010	12		2.62	978		105	0.315	U	0.32	1330		6.29	1.05	U	1.05	267		52.4
DZ-4	J19YD4	5/18/2010	9.86		1.74	975		69.6	0.209	U	0.21	1140		4.18	0.696	U	0.7	276		34.8
DZ-5	J19YD5	5/18/2010	9.92		1.97	1110		78.8	0.236	U	0.24	722		4.73	0.175	B	0.79	212		39.4
DZ-6	J19YD6	5/18/2010	9.93		1.78	844		71.3	0.214	U	0.21	634		4.28	0.713	U	0.71	214		35.6
DZ-7	J19YD7	5/18/2010	10.4		1.98	985		79.4	0.238	U	0.24	1190		4.76	0.794	U	0.79	247		39.7
DZ-8	J19YD8	5/18/2010	8.37		2.42	821		96.7	0.29	U	0.29	552		5.8	0.967	U	0.97	210		48.3
DZ-9	J19YD9	5/18/2010	13.7		2.18	731		87	0.261	U	0.26	507		5.22	0.87	U	0.87	221		43.5
DZ-10	J19YF0	5/18/2010	7.11		1.87	735		74.8	0.225	U	0.23	434		4.49	0.748	U	0.75	224		37.4
DZ-11	J19YF1	5/18/2010	9.14		2.1	892		84.2	0.253	U	0.25	565		5.05	0.842	U	0.84	245		42.1
DZ-12	J19YF2	5/18/2010	9.58		1.95	840		78	0.234	U	0.23	394		4.68	0.78	U	0.78	233		39
SPA-8	J19YJ4	5/17/2010	9.91		1.66	1410		66.3	0.199	U	0.2	433		3.98	0.145	B	0.66	183		33.2
Duplicate of SPA-8	J19YJ9	5/17/2010	10.2		2.03	1510		81.3	0.244	U	0.24	637		4.88	0.813	U	0.81	191		40.6
SPA-1	J19YH7	5/17/2010	9.52		2.12	748		85	0.255	U	0.26	362		5.1	0.85	U	0.85	173		42.5
SPA-2	J19YH8	5/17/2010	10.7		1.79	1800		71.7	0.215	U	0.22	617		4.3	0.717	U	0.72	200		35.9
SPA-3	J19YH9	5/17/2010	10.9		2.03	1980		81.1	0.243	U	0.24	753		4.87	0.811	U	0.81	203		40.6
SPA-4	J19YJ0	5/17/2010	10.2		1.61	1160		64.4	0.193	U	0.19	412		3.86	0.142	B	0.64	175		32.2
SPA-5	J19YJ1	5/17/2010	10.6		2.02	1760		81	0.243	U	0.24	493		4.86	0.81	U	0.81	179		40.5
SPA-6	J19YJ2	5/17/2010	9.26		1.94	1410		77.6	0.233	U	0.23	527		4.66	0.776	U	0.78	248		38.8
SPA-7	J19YJ3	5/17/2010	12		1.87	1200		74.8	0.224	U	0.22	535		4.49	0.748	U	0.75	220		37.4
SPA-9	J19YJ5	5/17/2010	11.2		1.57	1250		62.8	0.188	U	0.19	466		3.77	0.628	U	0.63	190		31.4
SPA-10	J19YJ6	5/17/2010	9.57		1.75	1190		69.9	0.21	U	0.21	442		4.19	0.145	B	0.7	190		34.9
SPA-11	J19YJ7	5/17/2010	10.4		1.75	1520		70.1	0.21	U	0.21	493		4.21	0.178	B	0.7	182		35.1
SPA-12	J19YJ8	5/17/2010	10.3		1.59	1720		63.6	0.191	U	0.19	457		3.82	0.157	B	0.64	191		31.8

Table B-2. 116-H-5 Deep Zone and Staging Pile Area Inorganic Data Results. (5 Pages)

Sample Location	HEIS Number	Sample Date	Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/2010	41		0.74	32.6		2.21
Duplicate of DZ-1	J19YF3	5/18/2010	45.4		0.93	34.6		2.79
DZ-2	J19YD2	5/18/2010	59.1		1.03	38.7		3.1
DZ-3	J19YD3	5/18/2010	47.2		1.05	38.2		3.15
DZ-4	J19YD4	5/18/2010	47.2		0.7	36.7		2.09
DZ-5	J19YD5	5/18/2010	45.1		0.79	36.7		2.36
DZ-6	J19YD6	5/18/2010	44.3		0.71	33.4		2.14
DZ-7	J19YD7	5/18/2010	49.3		0.79	70.2		2.38
DZ-8	J19YD8	5/18/2010	43.3		0.97	34		2.9
DZ-9	J19YD9	5/18/2010	50.2		0.87	36.1		2.61
DZ-10	J19YF0	5/18/2010	48.4		0.75	38		2.25
DZ-11	J19YF1	5/18/2010	45.8		0.84	41.3		2.53
DZ-12	J19YF2	5/18/2010	44.1		0.78	48.8		2.34
SPA-8	J19YJ4	5/17/2010	44.8		0.66	40		1.99
Duplicate of SPA-8	J19YJ9	5/17/2010	46.1		0.81	41.7		2.44
SPA-1	J19YH7	5/17/2010	40.9		0.85	34		2.55
SPA-2	J19YH8	5/17/2010	47		0.72	38.8		2.15
SPA-3	J19YH9	5/17/2010	46.3		0.81	39.9		2.43
SPA-4	J19YJ0	5/17/2010	43.4		0.64	32.5		1.93
SPA-5	J19YJ1	5/17/2010	41.1		0.81	37.9		2.43
SPA-6	J19YJ2	5/17/2010	44.5		0.78	45		2.33
SPA-7	J19YJ3	5/17/2010	43.7		0.75	37.9		2.24
SPA-9	J19YJ5	5/17/2010	43.2		0.63	41.6		1.88
SPA-10	J19YJ6	5/17/2010	39.1		0.7	38		2.1
SPA-11	J19YJ7	5/17/2010	45.3		0.7	42		2.1
SPA-12	J19YJ8	5/17/2010	45		0.64	41.2		1.91

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YD1 DZ-1 5/18/2010			J19YD2 DZ-2 5/18/2010			J19YD3 DZ-3 5/18/2010			J19YD4 DZ-4 5/18/2010			J19YD5 DZ-5 5/18/2010			J19YD6 DZ-6 5/18/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Acenaphthene	10.1		3.48	3.51	U	3.51	3.56	U	3.56	6.88		3.52	5.98		3.52	3.51	U	3.51
Acenaphthylene	3.48	U	3.48	3.51	U	3.51	3.56	U	3.56	3.52	U	3.52	3.52	U	3.52	3.51	U	3.51
Anthracene	3.48	U	3.48	3.51	U	3.51	0.891	J	3.56	1.41	J	3.52	3.52	U	3.52	12.8		3.51
Benzo(a)anthracene	5.76		3.48	3.69		3.51	21.2		3.56	14.5		3.52	5.46		3.52	69.1		3.51
Benzo(a)pyrene	5.93		3.48	2.46	J	3.51	17.8		3.56	15.7		3.52	5.1		3.52	61.7		3.51
Benzo(b)fluoranthene	8.89		3.48	3.86		3.51	33.7		3.56	25.8		3.52	6.51		3.52	88.4		3.51
Benzo(ghi)perylene	5.23		3.48	2.28	J	3.51	13.9		3.56	13.2		3.52	4.58		3.52	41.1		3.51
Benzo(k)fluoranthene	2.79	J	3.48	1.41	J	3.51	11.4		3.56	8.82		3.52	2.46	J	3.52	33.2		3.51
Chrysene	9.42		3.48	5.62		3.51	21.6		3.56	35.1		3.52	4.58		3.52	65		3.51
Dibenz[a,h]anthracene	3.48	U	3.48	3.51	U	3.51	2.5	J	3.56	2.65	J	3.52	3.52	U	3.52	9.49		3.51
Fluoranthene	14.1		3.48	9.13		3.51	42.8		3.56	40		3.52	18		3.52	211		3.51
Fluorene	3.48	U	3.48	3.51	U	3.51	3.56	U	3.56	2.12	J	3.52	3.52	U	3.52	5.27		3.51
Indeno(1,2,3-cd)pyrene	3.48	U	3.48	2.28	J	3.51	14.3		3.56	12.5		3.52	3.34	J	3.52	46.1		3.51
Naphthalene	3.48	U	3.48	3.51	U	3.51	3.56	U	3.56	3.52	U	3.52	3.52	U	3.52	3.51	U	3.51
Phenanthrene	5.58		3.48	3.16	J	3.51	6.77		3.56	9.17		3.52	6.51		3.52	50.5		3.51
Pyrene	12.9		3.48	7.2		3.51	46.7		3.56	34.2		3.52	12.3		3.52	194		3.51
Aroclor-1016	13.7	U	13.7	13.1	U	13.1	13.9	U	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aroclor-1221	13.7	U	13.7	13.1	U	13.1	13.9	U	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aroclor-1232	13.7	U	13.7	13.1	U	13.1	13.9	U	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aroclor-1242	13.7	U	13.7	13.1	U	13.1	13.9	U	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aroclor-1248	13.7	U	13.7	13.1	U	13.1	13.9	U	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aroclor-1254	13.7	U	13.7	13.1	U	13.1	13.9	U	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aroclor-1260	13.7	U	13.7	13.1	U	13.1	7.31	J	13.9	13.8	U	13.8	13.3	U	13.3	13.9	U	13.9
Aldrin	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Alpha-BHC	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
alpha-Chlordane	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Delta-BHC	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Dichlorodiphenyldichloroethane	1.37	UD	1.37	1.31	UD	1.31	2.12	JD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Dichlorodiphenyldichloroethylene	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Dichlorodiphenyltrichloroethane	1.37	UD	1.37	1.31	UD	1.31	3.1	JD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Dieldrin	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Endosulfan I	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Endosulfan II	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Endosulfan sulfate	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Endrin	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Endrin aldehyde	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Endrin ketone	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Gamma-BHC (Lindane)	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
gamma-Chlordane	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Heptachlor	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Heptachlor epoxide	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Methoxychlor	1.37	UD	1.37	1.31	UD	1.31	1.39	UD	1.39	1.39	UD	1.39	1.33	UD	1.33	1.4	UD	1.4
Toxaphene	20.6	UD	20.6	19.6	UD	19.6	20.9	UD	20.9	20.8	UD	20.8	20	UD	20	21	UD	21
1,2,4-Trichlorobenzene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
1,2-Dichlorobenzene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
1,3-Dichlorobenzene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
1,4-Dichlorobenzene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2,4,5-Trichlorophenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2,4,6-Trichlorophenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2,4-Dichlorophenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2,4-Dimethylphenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2,4-Dinitrophenol	1660	U	1660	1730	U	1730	1730	U	1730	1730	U	1730	1720	U	1720	1660	U	1660
2,4-Dinitrotoluene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2,6-Dinitrotoluene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2-Chloronaphthalene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2-Chlorophenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YD1 DZ-1 5/18/2010			J19YD2 DZ-2 5/18/2010			J19YD3 DZ-3 5/18/2010			J19YD4 DZ-4 5/18/2010			J19YD5 DZ-5 5/18/2010			J19YD6 DZ-6 5/18/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Methylnaphthalene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2-Methylphenol (cresol, o-)	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
2-Nitroaniline	1660	U	1660	1730	U	1730	1730	U	1730	1730	U	1730	1720	U	1720	1660	U	1660
2-Nitrophenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
3+4 Methylphenol (cresol, m+p)	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
3,3'-Dichlorobenzidine	665	U	665	693	U	693	691	U	691	693	U	693	687	U	687	662	U	662
3-Nitroaniline	1660	U	1660	1730	U	1730	1730	U	1730	1730	U	1730	1720	U	1720	1660	U	1660
4,6-Dinitro-2-methylphenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
4-Bromophenylphenyl ether	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
4-Chloro-3-methylphenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
4-Chloroaniline	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
4-Chlorophenylphenyl ether	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
4-Nitroaniline	1660	U	1660	1730	U	1730	1730	U	1730	1730	U	1730	1720	U	1720	1660	U	1660
4-Nitrophenol	1660	U	1660	1730	U	1730	1730	U	1730	1730	U	1730	1720	U	1720	1660	U	1660
Acenaphthene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Acenaphthylene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Anthracene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	92.2	J	331
Benzo(a)anthracene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	212	J	331
Benzo(a)pyrene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	164	J	331
Benzo(b)fluoranthene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	152	J	331
Benzo(ghi)perylene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	119	J	331
Benzo(k)fluoranthene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	158	J	331
Bis(2-chloro-1-methylethyl)ether	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Bis(2-Chloroethoxy)methane	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Bis(2-chloroethyl) ether	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Bis(2-ethylhexyl) phthalate	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Butylbenzylphthalate	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Carbazole	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Chrysene	333	U	333	347	U	347	53.9	J	346	346	U	346	343	U	343	219	J	331
Di-n-butylphthalate	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Di-n-octylphthalate	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Dibenz[a,h]anthracene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Dibenzofuran	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Diethyl phthalate	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Dimethyl phthalate	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Fluoranthene	333	U	333	347	U	347	85.7	J	85.7	58.1	J	346	343	U	343	543		331
Fluorene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Hexachlorobenzene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Hexachlorobutadiene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Hexachlorocyclopentadiene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Hexachloroethane	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Indeno(1,2,3-cd)pyrene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	102	J	331
Isophorone	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
N-Nitroso-di-n-dipropylamine	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
N-Nitrosodiphenylamine	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Naphthalene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Nitrobenzene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Pentachlorophenol	1660	U	1660	1730	U	1730	1730	U	1730	1730	U	1730	1720	U	1720	1660	U	1660
Phenanthrene	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	408		331
Phenol	333	U	333	347	U	347	346	U	346	346	U	346	343	U	343	331	U	331
Pyrene	333	U	333	347	U	347	85.4	J	346	52.9	J	346	343	U	343	335		331

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YD7 DZ-7 5/18/2010			J19YD8 DZ-8 5/18/2010			J19YD9 DZ-9 5/18/2010			J19YF0 DZ-10 5/18/2010			J19YF1 DZ-11 5/18/2010			J19YF2 DZ-12 5/18/2010			J19YF3 Duplicate of 5/18/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Acenaphthene	14.2	UD	14.2	37.1		3.54	3.48	U	3.48	3.49	U	3.49	7.77		3.38	3.4	U	3.4	3.33	U	3.33
Acenaphthylene	41.7	D	14.2	3.54	U	3.54	3.48	U	3.48	3.49	U	3.49	3.38	U	3.38	3.4	U	3.4	3.33	U	3.33
Anthracene	16.1	D	14.2	2.84	J	3.54	3.83		3.48	1.75	J	3.49	9.29		3.38	15.2		3.4	1.33	J	3.33
Benzo(a)anthracene	592	D	14.2	22.3		3.54	16.7		3.48	14.1		3.49	48.7		3.38	94		3.4	18.3		3.33
Benzo(a)pyrene	533	D	14.2	22.5		3.54	14.3		3.48	14.3		3.49	68.9		3.38	142		3.4	15.2		3.33
Benzo(b)fluoranthene	974	D	14.2	32.4		3.54	19		3.48	19.6		3.49	69.1		3.38	107		3.4	12.2		3.33
Benzo(ghi)perylene	488	D	14.2	19.5		3.54	10.1		3.48	10.1		3.49	3.38	U	3.38	3.4	U	3.4	8.33		3.33
Benzo(k)fluoranthene	350	D	14.2	11.5		3.54	7.49		3.48	6.99		3.49	27.4		3.38	57.2		3.4	6		3.33
Chrysene	602	D	14.2	27.7		3.54	18.5		3.48	15.2		3.49	32.6		3.38	51.1		3.4	26.3		3.33
Dibenz[a,h]anthracene	86.3	D	14.2	3.72		3.54	2.26	J	3.48	2.27	J	3.49	3.38	U	3.38	3.4	U	3.4	1.17	J	3.33
Fluoranthene	1140	D	14.2	47.3		3.54	6.09		3.48	39.8		3.49	112		3.38	177		3.4	40.5		3.33
Fluorene	14.2	UD	14.2	2.13	J	3.54	1.57	J	3.48	1.22	J	3.49	5.41		3.38	8.01		3.4	1.17	J	3.33
Indeno(1,2,3-cd)pyrene	460	D	14.2	18.1		3.54	10.8		3.48	11		3.49	3.38	U	3.38	3.4	U	3.4	9.33		3.33
Naphthalene	14.2	UD	14.2	3.54	U	3.54	3.48	U	3.48	3.49	U	3.49	3.38	U	3.38	3.4	U	3.4	3.33	U	3.33
Phenanthrene	79.1	D	14.2	12.8		3.54	14.1		3.48	1.75	J	3.49	40.7		3.38	55.9		3.4	14.7		3.33
Pyrene	1360	D	14.2	48.8		3.54	42.8		3.48	36.2		3.49	125		3.38	155		3.4	36		3.33
Aroclor-1016	13.8	U	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aroclor-1221	13.8	U	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aroclor-1232	13.8	U	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aroclor-1242	13.8	U	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aroclor-1248	13.8	U	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aroclor-1254	13.8	U	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aroclor-1260	6.28	J	13.8	14	U	14	13.4	U	13.4	13.8	U	13.8	14.1	U	14.1	13.7	U	13.7	13.8	U	13.8
Aldrin	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Alpha-BHC	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
alpha-Chlordane	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Delta-BHC	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Dichlorodiphenyldichloroethane	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Dichlorodiphenyldichloroethylene	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Dichlorodiphenyltrichloroethane	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Dieldrin	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Endosulfan I	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Endosulfan II	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Endosulfan sulfate	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Endrin	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Endrin aldehyde	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Endrin ketone	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Gamma-BHC (Lindane)	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
gamma-Chlordane	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Heptachlor	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Heptachlor epoxide	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Methoxychlor	1.38	UD	1.38	1.4	UD	1.4	1.34	UD	1.34	1.39	UD	1.39	1.41	UD	1.41	1.37	UD	1.37	1.39	UD	1.39
Toxaphene	20.7	UD	20.7	21.1	UD	21.1	20.1	UD	20.1	20.8	UD	20.8	21.2	UD	21.2	20.6	UD	20.6	20.8	UD	20.8
1,2,4-Trichlorobenzene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
1,2-Dichlorobenzene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
1,3-Dichlorobenzene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
1,4-Dichlorobenzene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2,4,5-Trichlorophenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2,4,6-Trichlorophenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2,4-Dichlorophenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2,4-Dimethylphenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2,4-Dinitrophenol	1720	U	1720	1740	U	1740	1680	U	1680	1720	U	1720	1750	U	1750	1700	U	1700	1720	U	1720
2,4-Dinitrotoluene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2,6-Dinitrotoluene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2-Chloronaphthalene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2-Chlorophenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YD7 DZ-7 5/18/2010			J19YD8 DZ-8 5/18/2010			J19YD9 DZ-9 5/18/2010			J19YF0 DZ-10 5/18/2010			J19YF1 DZ-11 5/18/2010			J19YF2 DZ-12 5/18/2010			J19YF3 Duplicate of 5/18/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Methylnaphthalene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2-Methylphenol (cresol, o-)	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
2-Nitroaniline	1720	U	1720	1740	U	1740	1680	U	1680	1720	U	1720	1750	U	1750	1700	U	1700	1720	U	1720
2-Nitrophenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
3+4 Methylphenol (cresol, m+p)	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
3,3'-Dichlorobenzidine	689	U	689	698	U	698	670	U	670	687	U	687	700	U	700	679	U	679	687	U	687
3-Nitroaniline	1720	U	1720	1740	U	1740	1680	U	1680	1720	U	1720	1750	U	1750	1700	U	1700	1720	U	1720
4,6-Dinitro-2-methylphenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
4-Bromophenylphenyl ether	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
4-Chloro-3-methylphenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
4-Chloroaniline	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
4-Chlorophenylphenyl ether	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
4-Nitroaniline	1720	U	1720	1740	U	1740	1680	U	1680	1720	U	1720	1750	U	1750	1700	U	1700	1720	U	1720
4-Nitrophenol	1720	U	1720	1740	U	1740	1680	U	1680	1720	U	1720	1750	U	1750	1700	U	1700	1720	U	1720
Acenaphthene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Acenaphthylene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Anthracene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Benzo(a)anthracene	682		344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Benzo(a)pyrene	515		344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Benzo(b)fluoranthene	666		344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Benzo(ghi)perylene	481		344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Benzo(k)fluoranthene	566		344	349	U	349	335	U	335	343	U	343	350	U	350	55.4	J	340	343	U	343
Bis(2-chloro-1-methylethyl)ether	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Bis(2-Chloroethoxy)methane	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Bis(2-chloroethyl) ether	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Bis(2-ethylhexyl) phthalate	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Butylbenzylphthalate	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Carbazole	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Chrysene	724		344	349	U	349	335	U	335	343	U	343	350	U	350	54.1	J	340	343	U	343
Di-n-butylphthalate	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Di-n-octylphthalate	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Dibenz[a,h]anthracene	134	J	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Dibenzofuran	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Diethyl phthalate	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Dimethyl phthalate	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Fluoranthene	954		344	349	U	349	335	U	335	343	U	343	350	U	350	78.6	J	340	343	U	343
Fluorene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Hexachlorobenzene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Hexachlorobutadiene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Hexachlorocyclopentadiene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Hexachloroethane	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Indeno(1,2,3-cd)pyrene	397		344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Isophorone	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
N-Nitroso-di-n-dipropylamine	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
N-Nitrosodiphenylamine	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Naphthalene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Nitrobenzene	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Pentachlorophenol	1720	U	1720	1740	U	1740	1680	U	1680	1720	U	1720	1750	U	1750	1700	U	1700	1720	U	1720
Phenanthrene	78.4	J	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Phenol	344	U	344	349	U	349	335	U	335	343	U	343	350	U	350	340	U	340	343	U	343
Pyrene	868		344	349	U	349	335	U	335	343	U	343	350	U	350	78.1	J	340	343	U	343

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YH7 SPA-1 5/17/2010			J19YH8 SPA-2 5/17/2010			J19YH9 SPA-3 5/17/2010			J19YJ0 SPA-4 5/17/2010			J19YJ1 SPA-5 5/17/2010			J19YJ2 SPA-6 5/17/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Acenaphthene	6.67	U	6.67	3.33	U	3.33	3.29	U	3.29	3.34	U	3.34	6.77		3.3	13.2	U	13.2
Acenaphthylene	6.67	U	6.67	34.9		3.33	3.29	U	3.29	16.7		3.34	85.1		3.3	53.3	D	13.2
Anthracene	71.7	D	6.67	3.33	U	3.33	1.7	J	3.29	3.34	U	3.34	3.3	U	3.3	62.3	D	13.2
Benzo(a)anthracene	258	D	6.67	7.26		3.33	4.56		3.29	1.04	J	3.34	14.5		3.3	334	D	13.2
Benzo(a)pyrene	307	D	6.67	10.5		3.33	5.52		3.29	2.07	J	3.34	10.4		3.3	380	D	13.2
Benzo(b)fluoranthene	338	D	6.67	11.2		3.33	4.51		3.29	1.81	J	3.34	7.95		3.3	366	D	13.2
Benzo(ghi)perylene	186	D	6.67	12.2		3.33	4.04		3.29	1.15	J	3.34	30.9		3.3	242	D	13.2
Benzo(k)fluoranthene	145	D	6.67	6.28		3.33	2.42	J	3.29	1	J	3.34	4.23		3.3	183	D	13.2
Chrysene	143	D	6.67	4.05		3.33	4.91		3.29	3.34	U	3.34	17.8		3.3	339	D	13.2
Dibenz[a,h]anthracene	39.9	D	6.67	1.5	J	3.33	3.29	U	3.29	3.34	U	3.34	9.3		3.3	49.8	D	13.2
Fluoranthene	731	D	6.67	29.7		3.33	17.7		3.29	6.67		3.34	33.5		3.3	905	D	13.2
Fluorene	32.9	D	6.67	3.33	U	3.33	3.29	U	3.29	3.34	U	3.34	3.3	U	3.3	32.2	D	13.2
Indeno(1,2,3-cd)pyrene	211	D	6.67	11.6		3.33	3.99		3.29	1.6	J	3.34	11.2		3.3	252	D	13.2
Naphthalene	6.67	U	6.67	3.33	U	3.33	3.29	U	3.29	3.34	U	3.34	3.3	U	3.3	13.2	U	13.2
Phenanthrene	247	D	6.67	10.6		3.33	5.73		3.29	1.96	J	3.34	12.1		3.3	326	D	13.2
Pyrene	790	D	6.67	22		3.33	10.6		3.29	1.49	J	3.34	24.2		3.3	956	D	13.2
Aroclor-1016	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.4	U	13.4
Aroclor-1221	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.4	U	13.4
Aroclor-1232	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.4	U	13.4
Aroclor-1242	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.4	U	13.4
Aroclor-1248	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.4	U	13.4
Aroclor-1254	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	20.8		13.4
Aroclor-1260	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	24.8		13.4
Aldrin	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Alpha-BHC	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
alpha-Chlordane	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Delta-BHC	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Dichlorodiphenyldichloroethane	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Dichlorodiphenyldichloroethylene	1.51	JD	1.51	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	268	D	268
Dichlorodiphenyltrichloroethane	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	17.5	D	17.5
Dieldrin	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Endosulfan I	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Endosulfan II	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Endosulfan sulfate	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Endrin	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Endrin aldehyde	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Endrin ketone	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Gamma-BHC (Lindane)	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
gamma-Chlordane	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Heptachlor	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Heptachlor epoxide	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Methoxychlor	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.34	UD	1.34	1.34	UD	1.34
Toxaphene	20.1	UD	20.1	19.9	UD	19.9	20.1	UD	20.1	20	UD	20	20.1	UD	20.1	20.1	UD	20.1
1,2,4-Trichlorobenzene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
1,2-Dichlorobenzene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
1,3-Dichlorobenzene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
1,4-Dichlorobenzene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2,4,5-Trichlorophenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2,4,6-Trichlorophenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2,4-Dichlorophenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2,4-Dimethylphenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2,4-Dinitrophenol	1640	U	1640	1650	U	1650	1660	U	1660	1630	U	1630	1650	U	1650	1630	U	1630
2,4-Dinitrotoluene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2,6-Dinitrotoluene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2-Chloronaphthalene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2-Chlorophenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YH7 SPA-1 5/17/2010			J19YH8 SPA-2 5/17/2010			J19YH9 SPA-3 5/17/2010			J19YJ0 SPA-4 5/17/2010			J19YJ1 SPA-5 5/17/2010			J19YJ2 SPA-6 5/17/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Methylnaphthalene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2-Methylphenol (cresol, o-)	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
2-Nitroaniline	1640	U	1640	1650	U	1650	1660	U	1660	1630	U	1630	1650	U	1650	1630	U	1630
2-Nitrophenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
3+4 Methylphenol (cresol, m+p)	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
3,3'-Dichlorobenzidine	655	U	655	662	U	662	664	U	664	650	U	650	662	U	662	651	U	651
3-Nitroaniline	1640	U	1640	1650	U	1650	1660	U	1660	1630	U	1630	1650	U	1650	1630	U	1630
4,6-Dinitro-2-methylphenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
4-Bromophenylphenyl ether	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
4-Chloro-3-methylphenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
4-Chloroaniline	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
4-Chlorophenylphenyl ether	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
4-Nitroaniline	1640	U	1640	1650	U	1650	1660	U	1660	1630	U	1630	1650	U	1650	1630	U	1630
4-Nitrophenol	1640	U	1640	1650	U	1650	1660	U	1660	1630	U	1630	1650	U	1650	1630	U	1630
Acenaphthene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Acenaphthylene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Anthracene	89.6	J	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Benzo(a)anthracene	435		327	331	U	331	332	U	332	325	U	325	331	U	331	179	J	326
Benzo(a)pyrene	400		327	331	U	331	332	U	332	325	U	325	331	U	331	176	J	326
Benzo(b)fluoranthene	369		327	331	U	331	332	U	332	325	U	325	331	U	331	172	J	326
Benzo(ghi)perylene	237	J	327	331	U	331	332	U	332	325	U	325	331	U	331	77.4	J	326
Benzo(k)fluoranthene	382		327	331	U	331	332	U	332	325	U	325	331	U	331	180	J	326
Bis(2-chloro-1-methylethyl)ether	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Bis(2-Chloroethoxy)methane	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Bis(2-chloroethyl) ether	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Bis(2-ethylhexyl) phthalate	327	U	327	273	J	331	332	U	332	325	U	325	331	U	331	326	U	326
Butylbenzylphthalate	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Carbazole	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Chrysene	441		327	331	U	331	332	U	332	325	U	325	331	U	331	194	J	326
Di-n-butylphthalate	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Di-n-octylphthalate	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Dibenz[a,h]anthracene	96.2	J	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Dibenzofuran	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Diethyl phthalate	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Dimethyl phthalate	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Fluoranthene	816		327	331	U	331	332	U	332	325	U	325	331	U	331	366		326
Fluorene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Hexachlorobenzene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Hexachlorobutadiene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Hexachlorocyclopentadiene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Hexachloroethane	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Indeno(1,2,3-cd)pyrene	243	J	327	331	U	331	332	U	332	325	U	325	331	U	331	83.1	J	326
Isophorone	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
N-Nitroso-di-n-dipropylamine	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
N-Nitrosodiphenylamine	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Naphthalene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Nitrobenzene	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Pentachlorophenol	1640	U	1640	1650	U	1650	1660	U	1660	1630	U	1630	1650	U	1650	1630	U	1630
Phenanthrene	318	J	327	331	U	331	332	U	332	325	U	325	331	U	331	171	J	326
Phenol	327	U	327	331	U	331	332	U	332	325	U	325	331	U	331	326	U	326
Pyrene	637		327	331	U	331	332	U	332	325	U	325	331	U	331	309	J	326

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YJ3 SPA-7 5/17/2010			J19YJ4 SPA-8 5/17/2010			J19YJ5 SPA-9 5/17/2010			J19YJ6 SPA-10 5/17/2010			J19YJ7 SPA-11 5/17/2010			J19YJ8 SPA-12 5/17/2010			J19YJ9 Duplicate of 5/17/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Acenaphthene	3.31	U	3.31	47.7		3.31	3.34	U	3.34	3.34	U	3.34	3.29	U	3.29	3.34	U	3.34	39.1		3.35
Acenaphthylene	3.31	U	3.31	3.31	U	3.31	3.34	U	3.34	3.34	U	3.34	13		3.29	3.34	U	3.34	3.35	U	3.35
Anthracene	6.24		3.31	29.7		3.31	4.66		3.34	4.65		3.34	6.44		3.29	4.89		3.34	28.4		3.35
Benzo(a)anthracene	40		3.31	141		3.31	61.2		3.34	68.6		3.34	57.5		3.29	47.8		3.34	128		3.35
Benzo(a)pyrene	41.9		3.31	117		3.31	64.5		3.34	75.1		3.34	72.4		3.29	52.4		3.34	142		3.35
Benzo(b)fluoranthene	55.2		3.31	148		3.31	81.8		3.34	98.4		3.34	91.8		3.29	67.8		3.34	179		3.35
Benzo(ghi)perylene	26.7		3.31	74.8		3.31	46.2		3.34	54.7		3.34	50.6		3.29	61.3		3.34	90.1		3.35
Benzo(k)fluoranthene	19		3.31	56.8		3.31	30		3.34	37.2		3.34	32.9		3.29	25.1		3.34	67		3.35
Chrysene	39		3.31	235		3.31	101		3.34	107		3.34	67.6		3.29	70.2		3.34	117		3.35
Dibenz[a,h]anthracene	4.74		3.31	14.3		3.31	8.71		3.34	10.6		3.34	8.93		3.29	8.69		3.34	19.2		3.35
Fluoranthene	133		3.31	297		3.31	149		3.34	220		3.34	171		3.29	139		3.34	333		3.35
Fluorene	2.85	J	3.31	14		3.31	2.89	J	3.34	7.59		3.34	3.05	J	3.29	2.49	J	3.34	11.9		3.35
Indeno(1,2,3-cd)pyrene	29		3.31	85.5		3.31	46.8		3.34	54.5		3.34	52.7		3.29	56.8		3.34	95.6		3.35
Naphthalene	3.31	U	3.31	3.31	U	3.31	16.4		3.34	7.54		3.34	13.7		3.29	3.34	U	3.34	3.35	U	3.35
Phenanthrene	47.6		3.31	143		3.31	41.7		3.34	65.9		3.34	51.1		3.29	52		3.34	128		3.35
Pyrene	104		3.31	299		3.31	148		3.34	185		3.34	158		3.29	123		3.34	346		3.35
Aroclor-1016	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1221	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1232	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1242	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1248	13.4	U	13.4	13.4	U	13.4	13.4	U	13.4	13.3	U	13.3	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1254	13.4	U	13.4	13.4	U	13.4	13	J	13.4	16.4		13.3	13.4	U	13.4	13.2	U	13.2	13.4	U	13.4
Aroclor-1260	4.45	J	13.4	5.35	J	13.4	11.7	J	13.4	16.8		13.3	5.37	J	13.4	13.2	U	13.2	5.26	J	13.4
Aldrin	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Alpha-BHC	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
alpha-Chlordane	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Delta-BHC	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Dichlorodiphenyldichloroethane	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Dichlorodiphenyldichloroethylene	1.37	JD	1.37	5.86	JD	5.86	24.7	D	24.7	10.3	D	10.3	4.87	JD	4.87	2.08	JD	2.08	6.74	D	6.74
Dichlorodiphenyltrichloroethane	1.34	UD	1.34	1.34	UD	1.34	2.54	JD	2.54	1.84	JD	1.84	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Dieldrin	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Endosulfan I	1.34	UD	1.34	1.35	JD	1.35	1.34	UD	1.34	4.68	JD	4.68	1.34	UD	1.34	1.32	UD	1.32	3.02	JD	3.02
Endosulfan II	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Endosulfan sulfate	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Endrin	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Endrin aldehyde	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Endrin ketone	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Gamma-BHC (Lindane)	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
gamma-Chlordane	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Heptachlor	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Heptachlor epoxide	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Methoxychlor	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.34	UD	1.34	1.32	UD	1.32	1.34	UD	1.34
Toxaphene	20.1	UD	20.1	20.2	UD	20.2	20.1	UD	20.1	20.1	UD	20.1	20.1	UD	20.1	19.8	UD	19.8	20.1	UD	20.1
1,2,4-Trichlorobenzene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
1,2-Dichlorobenzene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
1,3-Dichlorobenzene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
1,4-Dichlorobenzene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2,4,5-Trichlorophenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2,4,6-Trichlorophenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2,4-Dichlorophenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2,4-Dimethylphenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2,4-Dinitrophenol	1660	U	1660	1660	U	1660	1650	U	1650	1650	U	1650	1650	U	1650	1660	U	1660	3290	UD	3290
2,4-Dinitrotoluene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2,6-Dinitrotoluene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2-Chloronaphthalene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2-Chlorophenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658

Table B-3. 116-H-5 Deep Zone and Organics Data Results. (8 Pages)

Constituent	J19YJ3 SPA-7 5/17/2010			J19YJ4 SPA-8 5/17/2010			J19YJ5 SPA-9 5/17/2010			J19YJ6 SPA-10			J19YJ7 SPA-11 5/17/2010			J19YJ8 SPA-12 5/17/2010			J19YJ9 Duplicate of 5/17/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
2-Methylnaphthalene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2-Methylphenol (cresol, o-)	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
2-Nitroaniline	1660	U	1660	1660	U	1660	1650	U	1650	1650	U	1650	1650	U	1650	1660	U	1660	3290	UD	3290
2-Nitrophenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
3+4 Methylphenol (cresol, m+p)	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
3,3'-Dichlorobenzidine	663	U	663	663	U	663	661	U	661	660	U	660	660	U	660	663	U	663	1320	UD	1320
3-Nitroaniline	1660	U	1660	1660	U	1660	1650	U	1650	1650	U	1650	1650	U	1650	1660	U	1660	3290	UD	3290
4,6-Dinitro-2-methylphenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
4-Bromophenylphenyl ether	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
4-Chloro-3-methylphenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
4-Chloroaniline	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
4-Chlorophenylphenyl ether	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
4-Nitroaniline	1660	U	1660	1660	U	1660	1650	U	1650	1650	U	1650	1650	U	1650	1660	U	1660	3290	UD	3290
4-Nitrophenol	1660	U	1660	1660	U	1660	1650	U	1650	1650	U	1650	1650	U	1650	1660	U	1660	3290	UD	3290
Acenaphthene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	231	JD	658
Acenaphthylene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Anthracene	331	U	331	331	U	331	59.8	J	330	330	U	330	330	U	330	332	U	332	501	JD	658
Benzo(a)anthracene	70.2	J	331	91.6	J	331	283	J	330	84.4	J	330	121	J	330	117	J	332	1450	D	658
Benzo(a)pyrene	66.9	J	331	90.1	J	331	268	J	330	96.3	J	330	123	J	330	108	J	332	1310	D	658
Benzo(b)fluoranthene	62.7	J	331	88.5	J	331	260	J	330	97.3	J	330	119	J	330	102	J	332	1190	D	658
Benzo(ghi)perylene	331	U	331	331	U	331	115	J	330	330	U	330	54.7	J	330	117	J	332	906	D	658
Benzo(k)fluoranthene	65.8	J	331	91.5	J	331	269	J	330	93.6	J	330	117	J	330	90.8	J	332	1240	D	658
Bis(2-chloro-1-methylethyl)ether	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Bis(2-Chloroethoxy)methane	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Bis(2-chloroethyl) ether	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Bis(2-ethylhexyl) phthalate	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Butylbenzylphthalate	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Carbazole	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	267	JD	658
Chrysene	77.9	J	331	96.8	J	331	287	J	330	101	J	330	128	J	330	117	J	332	1440	D	658
Di-n-butylphthalate	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Di-n-octylphthalate	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Dibenz[a,h]anthracene	331	U	331	331	U	331	66.2	J	330	330	U	330	330	U	330	332	U	332	313	JD	658
Dibenzofuran	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	112	JD	658
Diethyl phthalate	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Dimethyl phthalate	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Fluoranthene	138	J	331	181	J	331	564		330	179	J	330	238	J	330	223	J	332	3120	D	658
Fluorene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	177	JD	658
Hexachlorobenzene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Hexachlorobutadiene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Hexachlorocyclopentadiene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Hexachloroethane	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Indeno(1,2,3-cd)pyrene	331	U	331	331	U	331	129	J	330	330	U	330	59.4	J	330	90.8	J	332	805	D	658
Isophorone	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
N-Nitroso-di-n-dipropylamine	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
N-Nitrosodiphenylamine	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Naphthalene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Nitrobenzene	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Pentachlorophenol	1660	U	1660	1660	U	1660	1650	U	1650	1650	U	1650	1650	U	1650	1660	U	1660	3290	UD	3290
Phenanthrene	64.2	J	331	105	J	331	240	J	330	73.4	J	330	104	J	330	111	J	332	2110	D	658
Phenol	331	U	331	331	U	331	330	U	330	330	U	330	330	U	330	332	U	332	658	UD	658
Pyrene	118	J	331	154	J	331	421		330	151	J	330	194	J	330	172	J	332	2190	D	658

APPENDIX C

SITE-SPECIFIC RESRAD CALCULATION FOR TECHNETIUM-99 AND LEAD

APPENDIX C

CALCULATION BRIEFS

The calculations in this appendix are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the files will be stored in a U.S. Department of Energy, Richland Operations Office, repository. These calculations have been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculation," Washington Closure Hanford, Richland, Washington. The following calculations are provided in this appendix.

116-H-5 RESRAD Calculation Brief for Lead & Tc-99 Groundwater and River Protection, 0100H-CA-V0163, Rev. 0, Washington Closure Hanford, Richland, Washington.

DISCLAIMER FOR CALCULATIONS

The calculations that are provided in this appendix have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

CALCULATION COVER SHEET

Project Title: 100-H Area Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0163

Subject: 116-H-5 RESRAD Calculation Brief for Lead & Tc-99 Groundwater and River Protection

Computer Program: RESRAD Program No: Version 6.5

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover – 1 pg Summary – 5 pg Attm. 1 - 18 pg Attm. 2 - 10 pg Total – 34 pages	S. W. Clark	M. W. Perrott	C. H. Dobie	D. F. Obenauer	4/26/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford DRAFT CALCULATION SHEET

Originator:	S. W. Clark	Date:	4/26/11	Calc. No.:	0100H-CA-V0163	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	M. W. Perrott	Date:	4/26/11
Subject:	116-H-5 RESRAD Calculation Brief for Lead and Tc-99 Groundwater and River Protection					Sheet No. 1 of 5	

PURPOSE:

Predict the groundwater and Columbia River concentrations over a period of 1,000 years from lead and technetium-99 analyses of the soil at the 116-H-5 cleanup verification sampling site.

GIVEN/REFERENCES:

1) Cleanup verification samples were collected from the excavation at the 116-H-5 waste site. Lead analysis of sample J1FKK5 (31.3 mg/kg) exceeded the lead soil cleanup levels for protection of the groundwater and the Columbia River. The Tc-99 analysis of sample JIFKM8 (0.8 mg/kg) exceeded soil cleanup levels for protection of the groundwater. The lead and Tc-99 analyses were evaluated by site-specific RESidual RADioactivity (RESRAD) modeling as described in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP). Site-specific RESRAD evaluations were performed to predict the lead and Tc-99 concentrations in groundwater due to lead and Tc-99 in the soil. Dilution and attenuation of lead and Tc-99 concentrations in groundwater as it flows from the area of the 116-H-5 waste site to the Columbia River was calculated using the formulas from the U.S. Environmental Protection Agency (EPA) *Soil Screening Guidance: User's Guide.*
2) Lead and Tc-99 analyses for HEIS sample numbers JIFKK5 and JIFKM8, respectively were obtained from laboratory sample data reports.
3) The RESidual RADioactivity (RESRAD) computer code, version 6.5, was developed for the U.S. Department of Energy by the Environmental Assessment Division of Argonne National Laboratory, Argonne, Illinois, to calculate compliance with residual radioactivity guidelines and may be accessed at < http://www.ead.anl.gov/resrad >.
4) Use of site-specific RESRAD evaluations to predict constituent concentrations in groundwater due to constituent concentrations in the soil at the individual sampling areas is discussed in Appendix C of the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) Formulas for calculation of dilution and attenuation in groundwater between the waste sites and the Columbia River were obtained from the *Soil Screening Guidance: User's Guide*, OSWER 9355.4-23, July 1996, U.S. Environmental Protection Agency, Washington, D.C.

SOLUTION:

1) As discussed in Sections 3.6.8 and 3.6.9 of the RDR/RAWP, the residual concentrations of radionuclides and nonradionuclides in the soil are compared to the soil remedial action goals (RAGs) for protection of groundwater and the Columbia River summarized in Table 2-1 of the RDR/RAWP. The groundwater and river protection RAGs are attained if the residual concentrations in soil are less than the RAGs in Table 2-1 and each sample data set meets the requirements of the WAC 173-340-740(7)(e) (1996) three-part test. If this is not the case, a more detailed assessment using RESRAD or other appropriate methods (e.g., dilution-attenuation evaluations) is used to assess the potential of residual site soil contaminants to impact groundwater and the river. If this more detailed assessment indicates that the residual contamination in the site soils will not impact groundwater or the river at concentrations

above groundwater or surface water cleanup levels, then the groundwater and river protection RAGs have been attained.

2) Site-specific RESRAD evaluations were performed for the lead and Tc-99 soil concentrations where the soil RAGs for groundwater and river protection were exceeded at the 116-H-5 sample locations. The areas of influence of the site-specific samples for purposes of the RESRAD evaluation are shown in Table 1, which includes soil concentrations and other parameters used in the RESRAD and dilution-attenuation calculations. Input factors for the RESRAD evaluation are also contained in the "Summary" section of the RESRAD "Mixture Sums and Single Radionuclide Guidelines" printout in Attachment 1 to this Calculation Summary.

Table 1. Waste Site-Specific Parameters for RESRAD and Dilution-Attenuation Modeling

Parameter	Units	Lead; 116-H-5 Sample # J1FKK5	Tc-99; 116-H-5 Sample # J1FKM8
Contaminant-Specific Input Parameters			
Radionuclide Surrogate for Lead		Cl-36	NA
Lead and Tc-99 Concentrations		31.3 mg/kg	0.8 pCi/g
Lead and Tc-99 Kd Value	mL/g	30	0
Contaminated Zone Dimensions			
Cover Depth	m	0	0
Area of Contaminated Zone (CZ)	m^2	426.9	124.6
Length Parallel to Aquifer Flow	m	21	12
Thickness of Vadose Zone Horizons			
Thickness: Contaminated Zone	m	1.0	11
Thickness: Unsaturated Zone	m	0	0
Distance from the Waste Sites to the Columbia River			
Saturated Zone Groundwater Flow Distance	m	40	NA

NA = Not Applicable

3) The years when the peak lead and Tc-99 concentrations are predicted to occur in groundwater from the waste sites were determined by preliminary RESRAD runs. These years were then added for all horizons for the final RESRAD runs. For the water pathways, the peak years for lead and Tc-99 in groundwater are predicted to occur at year 92 for lead and at year 0.5 for Tc-99.

METHODOLOGY:

1) Using the methodology described in Appendix C of the RDR/RAWP, RESRAD modeling was used to determine if residual soil concentrations of lead and Tc-99 are protective of groundwater. Runs of RESRAD version 6.5 were completed for the lead and Tc-99 soil concentrations where the groundwater and river protection RAGs were exceeded in the

Washington Closure Hanford	DRAFT CALCULATION SHEET						
Originator:	S. W. Clark *SWC*	Date:	4/26/11	Calc. No.:	0100H-CA-V0163	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	M. W. Perrott *MWP*	Date:	4/26/11
Subject:	116-H-5 RESRAD Calculation Brief for Lead and Tc-99 Groundwater and River Protection					Sheet No. 3 of 5	

116-H-5 waste site cleanup verification sampling activities using the long half-life radionuclide chlorine-36 (Cl-36) as a surrogate for evaluation of the lead concentration shown in Table 1 and replacing Cl-36 parameters with parameters specific to lead (such as the Kd value of 30 mL/g). RESRAD numerical output reports of predicted lead and Tc-99 concentrations in soil and groundwater are presented in Attachment 2 to this calculation summary.

2) Methodology for modeling to predict if soil concentrations are protective of the Columbia River is similar to that for modeling the protection of groundwater, with the groundwater concentration reduced by using a factor to account for dilution and attenuation as contaminants migrate through the groundwater to the river. Calculation of an appropriate dilution factor is accomplished using the formulas in the EPA *Soil Screening Guidance: User's Guide*. The following Excel spreadsheet incorporates the formulas for calculation of the dilution factor to account for dilution and attenuation as contaminants migrate through the groundwater to the river:

Table 2. Excel Calculation of Dilution Factor for Protection of the Columbia River

	A	B	C	D	E	F	G	H
1	Apparent Mixing Zone Depth (d) calculated from EPA *Soil Screening Guidance: User's Guide*, Equation 12:							
2	Apparent Mixing Zone Depth (d) = $(0.0112{*}L^2)^{0.5} + d_a(1 - \exp((-L{*}I)/(K{*}i{*}d_a)))$							
3	<u>Variable</u>	<u>Value</u>	<u>Description</u>					
4	L	40	m, Distance to the Columbia River from J1FKK5					
5	d_a	10	m, Aquifer Thickness					
6	I	0.07992	m/yr, Infiltration Rate, from I = (1-Ce((1-Cr)Pr + Irr					
7	Ce	0.91	Evapotranspiration Coefficient					
8	Cr	0.2	Runoff Coefficient					
9	Pr	0.16	m/yr, Precipitation					
10	Irr	0.76	m/yr, Irrigation					
11	K	5530	m/yr, Aquifer Hydraulic Conductivity					
12	i	0.00125	m/m, Hydraulic Gradient					
13								
14	Calculation of Dilution Factor per the EPA *Soil Screening Guidance: User's Guide*, Equation 11.							
15	Dilution Factor, D = 1 + (K*i*d/I*L)							
16	<u>Variable</u>	<u>Value</u>	<u>Description</u>					
17	K	5530	m/yr, Aquifer Hydraulic Conductivity					
18	i	0.00125	m/m, Hydraulic Gradient					
19	d	4.685	m, Apparent Mixing Zone Depth (see formula below)					
20	I	0.07992	m/yr, Infiltration Rate, from I = (1-Ce((1-Cr)Pr + Irr					
21	L	40	m, Distance to the Columbia River from J1FKK5					
22	Apparent Mixing Zone Depth (d) = E24 = ((0.0112*B4*B4)^0.5)+(B5*(1-EXP((-B4)*(B6)/(B11*B12*B5)))							
23	Dilution Factor (D) = E25 = 1+((B17*B18*B19)/(B20*B21))							
24	J1FKK5 Apparent Mixing Zone Depth (d) =				4.685	m		
25	J1FKK5 Dilution Factor (D) =				11.1			

Washington Closure Hanford DRAFT CALCULATION SHEET

Originator:	S. W. Clark	Date:	4/26/11	Calc. No.:	0100H-CA-V0163	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	M. W. Perrott	Date:	4/26/11
Subject:	116-H-5 RESRAD Calculation Brief for Lead and Tc-99 Groundwater and River Protection					Sheet No. 4 of 5	

RESULTS:

1) Groundwater Protection

The lead and Tc-99 concentrations in groundwater at different time intervals for up to 1,000 years were calculated by the RESRAD model using Cl-36 as a radionuclide surrogate for lead. RESRAD output is presented in Attachment 2 and summarized in Table 3. Lead and Tc-99 are predicted to reach groundwater within the 1,000 years of the RESRAD model evaluation and are predicted to peak at year 92 for lead and at year 0.5 for Tc-99 at the maximum groundwater concentrations shown in Table 3 (7.82 ug/L for lead and 197 pCi/L for Tc-99), which are less than the groundwater RAGs of 15 ug/L for lead and 900 pCi/L for Tc-99 from Tables B-2 and B-6, respectively of Appendix B of the RDR/RAWP.

Table 3. Predicted Groundwater (Well Water/Drinking Water) Concentrations at 116-H-5

Contaminant	Sample Number	Groundwater Concentrations in ug/L or pCi/L at Each Time Interval (yr)								RAGs
		0	0.5	1	10	30	92	300	1000	
Lead, ug/L	J1FKK5	0	0.043	0.086	0.86	2.57	7.82	7.44	6.28	15 ug/L[a]
Tc-99, pCi/L	J1FKM8	0	197	193.5	138	65.1	6.35	0	0	900 pCi/L[b]

[a] Based on the maximum contaminant level (MCL) for lead from 40 CFR 141, as discussed in Appendix B, Table B-2, of the a RDR/RAWP.
[b] Based on the maximum contaminant level (MCL) for Tc-99, as discussed in Appendix B and Table B-6, of the RDR/RAWP.

2) Columbia River Protection

Predicted lead and Tc-99 concentrations in groundwater at the Columbia River were calculated by dividing the predicted groundwater concentrations at the 116-H-5 waste sites in Table 3 by the dilution factor of 11.1 determined in Table 2. Results are summarized in Table 4. Due to dilution and attenuation, lead is predicted to reach the river at a maximum groundwater concentration of 0.705 ug/L, which is less than the RAG of 2.1 ug/L, from Table B-3 of Appendix B of the RDR/RAWP. Tc-99 is predicted to reach the river at a maximum groundwater concentration of 17.7 pCi/L, which is less than the RAG of 900 pCi/L, from Table B-6 of Appendix B of the RDR/RAWP.

Table 4. Predicted Groundwater Concentration at the Columbia River Based on Dilution and Attenuation of Groundwater from 116-H-5

Contaminant	Sample Number	Groundwater Concentrations in ug/L or pCi/L at Each Time Interval (yr)								RAGs
		0	0.5	1	10	30	92	300	1000	
Lead, ug/L	J1FKK5	0	0.004	0.008	0.077	0.232	0.705	0.670	0.566	2.1 ug/L[a]
Tc-99, pCi/L	J1FKM8	0	17.7	17.4	12.4	5.87	0.572	0	0	900 pCi/L[b]

[a] Based on the surface water ambient water quality criteria (AWQC) for Lead from 40 CFR 131.36, as discussed in Appendix B, Table B-3, of the RDR/RAWP.
[b] Based on the maximum contaminant level (MCL) for Tc-99, as discussed in Appendix B and Table B-6, of the RDR/RAWP.

Washington Closure Hanford DRAFT CALCULATION SHEET

Originator:	S. W. Clark	Date:	4/26/11	Calc. No.:	0100H-CA-V0163	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	M. W. Perrott	Date:	4/26/11
Subject:	116-H-5 RESRAD Calculation Brief for Lead and Tc-99 Groundwater and River Protection					Sheet No. 5 of 5	

CONCLUSIONS:

- Maximum lead and Tc-99 concentrations in the soil at the 116-H-5 waste site are predicted to be protective of groundwater and the Columbia River for 1,000 years based upon RESRAD vadose zone modeling and evaluation of dilution-attenuation in the saturated zone using the formulas in the EPA *Soil Screening Guidance: User's Guide.*

- The lead and Tc-99 concentrations in groundwater at different time intervals up to 1,000 years as calculated by the RESRAD model using Cl-36 as a radionuclide surrogate for lead are summarized in Table 3. Lead concentrations in groundwater are predicted to peak at year 92 at a maximum concentration of 7.82 ug/L. Tc-99 concentrations in groundwater are predicted to peak at year 0.5 at a maximum concentration of 197 pCi/L. The predicted maximum groundwater concentrations are less than the groundwater cleanup RAGs of 2.1 ug/L for lead from Table B-2 and 900 pCi/L for Tc-99 from Table B-6 of Appendix B of the RDR/RAWP.

- Lead and Tc-99 concentrations in groundwater at the Columbia River were calculated by dividing the predicted groundwater concentrations at the 116-H-5 waste site in Table 3 by the dilution factor of 11.1 determined in Table 2. Results are summarized in Table 4. Due to dilution and attenuation, lead from 116-H-5 is predicted to reach the river at a maximum concentration of 0.705 ug/L, which is less than the surface water cleanup RAG of 1.2 ug/L from Table B-3 of Appendix B of the RDR/RAWP. Tc-99 is predicted to reach the river at a maximum groundwater concentration of 17.7 pCi/L, which is less than the RAG of 900 pCi/L, from Table B-6 of Appendix B of the RDR/RAWP.

ATTACHMENTS:

1. RESRAD Output: 116-H-5 Lead and Tc-99 Groundwater and River Protection – Mixture Sums and Single Radionuclide Guidelines (19 pages).
2. RESRAD Output: 116-H-5 Lead and Tc-99 Groundwater and River Protection – Concentration of Radionuclides, (10 pages).

ATTACHMENT 1

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1RESRAD, Version 6.5      T« Limit = 180 days      04/25/2011  13:26  Page   1
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                       Table of Contents
                       ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
   Part I: Mixture Sums and Single Radionuclide Guidelines
   ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ
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Attachment 1 Sheet No. 1 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

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1RESRAD, Version 6.5      T« Limit = 180 days        04/25/2011  13:26  Page   2
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                              Dose Conversion Factor (and Related) Parameter Summary
                                          Dose Library: FGR 12 & FGR 11
0      ³                                                                   ³  Current  ³   Base    ³  Parameter
 Menu  ³                            Parameter                              ³  Value#   ³   Case*   ³    Name
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 A-1   ³ DCF's for external ground radiation, (mrem/yr)/(pCi/g)            ³           ³           ³
 A-1   ³ Cl-36     (Source: FGR 12)                                        ³ 2.391E-03 ³ 2.391E-03 ³ DCF1(  1)
       ³                                                                   ³           ³           ³
 B-1   ³ Dose conversion factors for inhalation, mrem/pCi:                 ³           ³           ³
 B-1   ³ Cl-36                                                             ³ 2.190E-05 ³ 2.190E-05 ³ DCF2(  1)
       ³                                                                   ³           ³           ³
 D-1   ³ Dose conversion factors for ingestion, mrem/pCi:                  ³           ³           ³
 D-1   ³ Cl-36                                                             ³ 3.030E-06 ³ 3.030E-06 ³ DCF3(  1)
       ³                                                                   ³           ³           ³
 D-34  ³ Food transfer factors:                                            ³           ³           ³
 D-34  ³ Cl-36       , plant/soil concentration ratio, dimensionless       ³ 2.000E+01 ³ 2.000E+01 ³ RTF(  1,1)
 D-34  ³ Cl-36       , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)       ³ 6.000E-02 ³ 6.000E-02 ³ RTF(  1,2)
 D-34  ³ Cl-36       , milk/livestock-intake ratio, (pCi/L)/(pCi/d)        ³ 2.000E-02 ³ 2.000E-02 ³ RTF(  1,3)
       ³                                                                   ³           ³           ³
 D-5   ³ Bioaccumulation factors, fresh water, L/kg:                       ³           ³           ³
 D-5   ³ Cl-36       , fish                                                ³ 1.000E+03 ³ 1.000E+03 ³ BIOFAC(  1,1)
 D-5   ³ Cl-36       , crustacea and mollusks                              ³ 1.900E+02 ³ 1.900E+02 ³ BIOFAC(  1,2)
ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 A-1   ³ DCF's for external ground radiation, (mrem/yr)/(pCi/g)            ³           ³           ³
 A-1   ³ Tc-99     (Source: FGR 12)                                        ³ 1.255E-04 ³ 1.255E-04 ³ DCF1(  1)
       ³                                                                   ³           ³           ³
 B-1   ³ Dose conversion factors for inhalation, mrem/pCi:                 ³           ³           ³
 B-1   ³ Tc-99                                                             ³ 8.320E-06 ³ 8.320E-06 ³ DCF2(  1)
       ³                                                                   ³           ³           ³
 D-1   ³ Dose conversion factors for ingestion, mrem/pCi:                  ³           ³           ³
 D-1   ³ Tc-99                                                             ³ 1.460E-06 ³ 1.460E-06 ³ DCF3(  1)
       ³                                                                   ³           ³           ³
 D-34  ³ Food transfer factors:                                            ³           ³           ³
 D-34  ³ Tc-99       , plant/soil concentration ratio, dimensionless       ³ 5.000E+00 ³ 5.000E+00 ³ RTF(  1,1)
 D-34  ³ Tc-99       , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)       ³ 1.000E-04 ³ 1.000E-04 ³ RTF(  1,2)
 D-34  ³ Tc-99       , milk/livestock-intake ratio, (pCi/L)/(pCi/d)        ³ 1.000E-03 ³ 1.000E-03 ³ RTF(  1,3)
       ³                                                                   ³           ³           ³
 D-5   ³ Bioaccumulation factors, fresh water, L/kg:                       ³           ³           ³
 D-5   ³ Tc-99       , fish                                                ³ 2.000E+01 ³ 2.000E+01 ³ BIOFAC(  1,1)
 D-5   ³ Tc-99       , crustacea and mollusks                              ³ 5.000E+00 ³ 5.000E+00 ³ BIOFAC(  1,2)
ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ
#For DCF1(xxx) only, factors are for infinite depth & area.  See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.
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Attachment 1	Sheet No. 2 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 1

1RESRAD, Version 6.5 T« Limit = 180 days 04/25/2011 13:26 Page 3
Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Cl-36 Area of contaminated zone (m**2)	4.269E+02	1.000E+04	---	AREA
R011	Cl-36 Thickness of contaminated zone (m)	1.000E+00	2.000E+00	---	THICK0
R011	Tc-99 Area of contaminated zone (m**2)	1.246E+02	1.000E+04	---	AREA
R011	Tc-99 Thickness of contaminated zone (m)	1.100E+01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	2.100E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	5.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	1.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	3.000E+00	1.000E+01	---	T(4)
R011	Times for calculations (yr)	1.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	3.000E+01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	9.200E+01	3.000E+02	---	T(7)
R011	Times for calculations (yr)	3.000E+02	1.000E+03	---	T(8)
R011	Times for calculations (yr)	1.000E+03	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Cl-36	3.130E+01	0.000E+00	---	S1(1)
R012	Concentration in groundwater (pCi/L): Cl-36	not used	0.000E+00	---	W1(1)
R012	Initial principal radionuclide (pCi/g): Tc-99	8.000E-01	0.000E+00	---	S1(1)
R012	Concentration in groundwater (pCi/L): Tc-99	not used	0.000E+00	---	W1(1)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.600E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	1.500E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.500E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	4.050E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	3.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.100E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.600E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.500E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	1.500E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.530E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.250E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	4.600E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02	---	UW

Attachment 1 Sheet No. 3 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

ATTACHMENT 1

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   4
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Number of unsaturated zone strata	0	1	---	NS
R016	Distribution coefficients for Cl-36				
R016	Contaminated zone (cm**3/g)	3.000E+01	1.000E-01	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	3.000E+01	1.000E-01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.392E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Tc-99				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.751E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R017	Inhalation rate (m**3/yr)	not used	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	not used	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	not used	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	not used	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	not used	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	not used	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)

Attachment 1	Sheet No. 4 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 1

1RESRAD, Version 6.5 T« Limit = 180 days 04/25/2011 13:26 Page 5
Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Soil ingestion rate (g/yr)	not used	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	7.300E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	not used	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5

Attachment 1 Sheet No. 5 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
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1RESRAD, Version 6.5   T« Limit = 180 days   04/25/2011 13:26 Page 6
Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	1	---	---	LYMAX
TITL	Maximum number of integration points for risk	5	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	suppressed
2 -- inhalation (w/o radon)	suppressed
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	suppressed
9 -- radon	suppressed
Find peak pathway doses	suppressed

Attachment 1 Sheet No. 6 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   7
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

      Contaminated Zone Dimensions                 Initial Soil Concentrations, pCi/g
      ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ                  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
        Cl-36 Area:    426.90 square meters             Cl-36      3.130E+01
   Cl-36 Thickness:      1.00 meters
 Cl-36 Cover Depth:      0.00 meters

        Tc-99 Area:    124.60 square meters             Tc-99      8.000E-01
   Tc-99 Thickness:     11.00 meters
 Tc-99 Cover Depth:      0.00 meters

                                     Total Dose TDOSE(t), mrem/yr
                                Basic Radiation Dose Limit = 1.500E+01 mrem/yr
                      Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)
                      ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
    t (years):  0.000E+00  5.000E-01  1.000E+00  3.000E+00  1.000E+01  3.000E+01  9.200E+01  3.000E+02  1.000E+03
     TDOSE(t):  0.000E+00  9.468E-05  1.899E-04  5.705E-04  1.901E-03  5.691E-03  1.730E-02  1.646E-02  1.390E-02
         M(t):  0.000E+00  6.312E-06  1.266E-05  3.803E-05  1.268E-04  3.794E-04  1.154E-03  1.097E-03  9.264E-04
0Maximum TDOSE(t):  1.730E-02 mrem/yr   at t =    92.0 ñ 0.2 years
0
                        Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                   As mrem/yr and Fraction of Total Dose At t = 9.200E+01 years
                                     Water Independent Pathways (Inhalation excludes radon)
              Ground           Inhalation          Radon             Plant             Meat              Milk              Soil
Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Nuclide  mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.
ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ
Cl-36    0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
Tc-99    5.661E-05 0.0002  1.660E-07 0.0000  0.000E+00 0.0000  4.031E-02 0.1557  8.815E-06 0.0000  1.977E-04 0.0008  8.344E-06 0.0000
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                        Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                   As mrem/yr and Fraction of Total Dose At t = 9.200E+01 years
                                                     Water Dependent Pathways
              Water              Fish              Radon             Plant             Meat              Milk          All Pathways*
Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Nuclide  mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.
ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ
Cl-36    1.730E-02 1.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  1.730E-02 1.0000
Tc-99    2.106E-01 0.8135  2.395E-04 0.0009  0.000E+00 0.0000  7.370E-03 0.0285  2.818E-06 0.0000  9.412E-05 0.0004  2.589E-01 1.0000
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*Sum of all water independent and dependent pathways.
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Attachment 1	Sheet No. 7 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   8
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                      Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                     As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
0                                       Water Independent Pathways (Inhalation excludes radon)
D           Ground           Inhalation           Radon             Plant              Meat               Milk               Soil
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.
 ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ
 Cl-36   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
 Tc-99   5.766E-05 0.0014  1.691E-07 0.0000  0.000E+00 0.0000  4.100E-02 0.9933  8.920E-06 0.0002  2.005E-04 0.0049  8.499E-06 0.0002
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 Total   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
0
                      Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                     As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
0                                                Water Dependent Pathways
0           Water             Fish              Radon             Plant              Meat               Milk          All Pathways*
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.
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 Cl-36   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
 Tc-99   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  4.128E-02 1.0000
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 Total   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
0*Sum of all water independent and dependent pathways.
```

Attachment 1	Sheet No. 8 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

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1RESRAD, Version 6.5       T« Limit = 180 days        04/25/2011  13:26  Page    9
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                   As mrem/yr and Fraction of Total Dose At t = 5.000E-01 years
0                                    Water Independent Pathways (Inhalation excludes radon)
0            Ground           Inhalation          Radon             Plant              Meat               Milk               Soil
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide  mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.
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 Cl-36   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
 Tc-99   5.659E-05 0.0002  1.660E-07 0.0000  0.000E+00 0.0000  4.030E-02 0.1558  8.813E-06 0.0000  1.977E-04 0.0008  8.341E-06 0.0000
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 Total   0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000
0
                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                   As mrem/yr and Fraction of Total Dose At t = 5.000E-01 years
0                                                Water Dependent Pathways
0            Water              Fish              Radon             Plant              Meat               Milk          All Pathways*
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide  mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.    mrem/yr  fract.
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 Cl-36   9.468E-05 1.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  9.468E-05 1.0000
 Tc-99   2.105E-01 0.8134  2.391E-04 0.0009  0.000E+00 0.0000  7.359E-03 0.0284  2.884E-06 0.0000  9.560E-05 0.0004  2.587E-01 1.0000
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 Total   9.468E-05 1.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  0.000E+00 0.0000  9.468E-05 1.0000
0*Sum of all water independent and dependent pathways.
```

Attachment 1	Sheet No. 9 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

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1RESRAD, Version 6.5      T« Limit = 180 days        04/25/2011  13:26  Page  10
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD
```

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cl-36	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	5.554E-05	0.0002	1.629E-07	0.0000	0.000E+00	0.0000	3.955E-02	0.1560	8.649E-06	0.0000	1.940E-04	0.0008	8.186E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cl-36	1.899E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.899E-04	1.0000
Tc-99	2.063E-01	0.8134	2.327E-04	0.0009	0.000E+00	0.0000	7.155E-03	0.0282	3.747E-06	0.0000	1.051E-04	0.0004	2.536E-01	1.0000
Total	1.899E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.899E-04	1.0000

0*Sum of all water independent and dependent pathways.

Attachment 1 Sheet No. 10 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page  11
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD
```

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0
Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Cl-36	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	5.153E-05	0.0002	1.511E-07	0.0000	0.000E+00	0.0000	3.669E-02	0.1560	8.024E-06	0.0000	1.800E-04	0.0008	7.595E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

0
Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
0
Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Cl-36	5.705E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.705E-04	1.0000
Tc-99	1.913E-01	0.8134	2.159E-04	0.0009	0.000E+00	0.0000	6.638E-03	0.0282	3.476E-06	0.0000	9.746E-05	0.0004	2.352E-01	1.0000
Total	5.705E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.705E-04	1.0000

0*Sum of all water independent and dependent pathways.

Attachment 1	Sheet No. 11 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 1

1RESRAD, Version 6.5 T« Limit = 180 days 04/25/2011 13:26 Page 12
Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years
0 Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Cl-36	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	3.963E-05	0.0002	1.162E-07	0.0000	0.000E+00	0.0000	2.822E-02	0.1560	6.171E-06	0.0000	1.384E-04	0.0008	5.841E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years
0 Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Cl-36	1.901E-03	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.901E-03	1.0000
Tc-99	1.471E-01	0.8134	1.660E-04	0.0009	0.000E+00	0.0000	5.103E-03	0.0282	2.672E-06	0.0000	7.493E-05	0.0004	1.809E-01	1.0000
Total	1.901E-03	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.901E-03	1.0000

0*Sum of all water independent and dependent pathways.

Attachment 1 Sheet No. 12 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

ATTACHMENT 1

1RESRAD, Version 6.5   T« Limit = 180 days   04/25/2011 13:26 Page 13
Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
File   : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years
0
Water Independent Pathways (Inhalation excludes radon)
0

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Cl-36	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	1.872E-05	0.0002	5.489E-08	0.0000	0.000E+00	0.0000	1.333E-02	0.1561	2.914E-06	0.0000	6.537E-05	0.0008	2.759E-06	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years
0
Water Dependent Pathways
0

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Cl-36	5.691E-03	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.691E-03	1.0000
Tc-99	6.941E-02	0.8132	7.832E-05	0.0009	0.000E+00	0.0000	2.408E-03	0.0282	1.261E-06	0.0000	3.536E-05	0.0004	8.535E-02	1.0000
Total	5.691E-03	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.691E-03	1.0000

0*Sum of all water independent and dependent pathways.

Attachment 1	Sheet No. 13 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 1

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1RESRAD, Version 6.5     T« Limit = 180 days       04/25/2011  13:26  Page  14
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                As mrem/yr and Fraction of Total Dose At t = 9.200E+01 years
0                                    Water Independent Pathways (Inhalation excludes radon)
0           Ground           Inhalation           Radon             Plant              Meat              Milk              Soil
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.
 ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ
 Cl-36   0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000
 Tc-99   1.829E-06 0.0002 5.364E-09 0.0000 0.000E+00 0.0000 1.302E-03 0.1565 2.848E-07 0.0000 6.389E-06 0.0008 2.696E-07 0.0000
 ÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ
 Total   0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000
0
                     Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                As mrem/yr and Fraction of Total Dose At t = 9.200E+01 years
0                                              Water Dependent Pathways
0           Water             Fish              Radon             Plant              Meat              Milk          All Pathways*
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.  mrem/yr  fract.
 ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄ
 Cl-36   1.730E-02 1.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.730E-02 1.0000
 Tc-99   6.764E-03 0.8129 7.632E-06 0.0009 0.000E+00 0.0000 2.346E-04 0.0282 1.229E-07 0.0000 3.445E-06 0.0004 8.321E-03 1.0000
 ÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍ
 Total   1.730E-02 1.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.730E-02 1.0000
0*Sum of all water independent and dependent pathways.
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Attachment	1	Sheet No.	14 of 18
Originator:	S. W. Clark	Date	4/26/2011
Chk'd By	M. W. Perrott	Date	4/26/2011
Calc. No.	0100H-CA-V0163	Rev. No.	0

ATTACHMENT 1

1RESRAD, Version 6.5 T« Limit = 180 days 04/25/2011 13:26 Page 15
Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years
0 Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cl-36	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Tc-99	7.481E-10	0.0002	2.194E-12	0.0000	0.000E+00	0.0000	5.327E-07	0.1579	1.165E-10	0.0000	2.613E-09	0.0008	1.103E-10	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years
0 Water Dependent Pathways

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cl-36	1.646E-02	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-02	1.0000
Tc-99	2.739E-06	0.8116	3.090E-09	0.0009	0.000E+00	0.0000	9.500E-08	0.0282	4.975E-11	0.0000	1.395E-09	0.0004	3.375E-06	1.0000
Total	1.646E-02	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.646E-02	1.0000

0*Sum of all water independent and dependent pathways.

Attachment	1	Sheet No.	15 of 18
Originator:	S. W. Clark	Date	4/26/2011
Chk'd By	M. W. Perrott	Date	4/26/2011
Calc. No.	0100H-CA-V0163	Rev. No.	0

ATTACHMENT 1

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page  16
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                         Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                  As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
0                                    Water Independent Pathways (Inhalation excludes radon)
0            Ground          Inhalation         Radon            Plant             Meat              Milk              Soil
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide  mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.
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 Cl-36   0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000
 Tc-99   2.959E-21 0.0002 8.677E-24 0.0000 0.000E+00 0.0000 2.107E-18 0.1628 4.608E-22 0.0000 1.034E-20 0.0008 4.361E-22 0.0000
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 Total   0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000
0
                         Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
                                  As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years
0                                                Water Dependent Pathways
0            Water             Fish            Radon            Plant             Meat              Milk         All Pathways*
 Radio-  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
 Nuclide  mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.   mrem/yr  fract.
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 Cl-36   1.390E-02 1.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.390E-02 1.0000
 Tc-99   1.044E-17 0.8068 1.178E-20 0.0009 0.000E+00 0.0000 3.622E-19 0.0280 1.897E-22 0.0000 5.318E-21 0.0004 1.294E-17 1.0000
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 Total   1.390E-02 1.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 0.000E+00 0.0000 1.390E-02 1.0000
0*Sum of all water independent and dependent pathways.
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Attachment 1	Sheet No. 16 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 1

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page  17
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                                     Dose/Source Ratios Summed Over All Pathways
                              Parent and Progeny Principal Radionuclide Contributions Indicated
0  Parent     Product    Thread                          DSR(j,t) At Time in Years   (mrem/yr)/(pCi/g)
    (i)         (j)      Fraction   0.000E+00 5.000E-01 1.000E+00 3.000E+00 1.000E+01 3.000E+01 9.200E+01 3.000E+02 1.000E+03
 ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ
 Cl-36       Cl-36       1.000E+00  0.000E+00 3.025E-06 6.066E-06 1.823E-05 6.074E-05 1.818E-04 5.528E-04 5.257E-04 4.440E-04
 Tc-99       Tc-99       1.000E+00  5.160E-02 3.234E-01 3.170E-01 2.941E-01 2.261E-01 1.067E-01 1.040E-02 4.218E-06 1.618E-17
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 The DSR includes contributions from associated (half-life ó 180 days) daughters.
0
                                   Single Radionuclide Soil Guidelines G(i,t) in pCi/g
                                     Basic Radiation Dose Limit = 1.500E+01 mrem/yr
0Nuclide
   (i)     t= 0.000E+00    5.000E-01    1.000E+00    3.000E+00    1.000E+01    3.000E+01    9.200E+01    3.000E+02    1.000E+03
 ÄÄÄÄÄÄÄ       ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ    ÄÄÄÄÄÄÄÄÄ
 Cl-36        *3.302E+10    4.959E+06    2.473E+06    8.230E+05    2.469E+05    8.250E+04    2.713E+04    2.853E+04    3.379E+04
 Tc-99         2.907E+02    4.638E+01    4.732E+01    5.101E+01    6.635E+01    1.406E+02    1.442E+03    3.556E+06   *1.697E+10
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 *At specific activity limit
0
            Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
            and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
          at tmin = time of minimum single radionuclide soil guideline
      and at tmax = time of maximum total dose =     92.0 ñ 0.2 years
0Nuclide  Initial          tmin        DSR(i,tmin) G(i,tmin) DSR(i,tmax) G(i,tmax)
   (i)    (pCi/g)        (years)                    (pCi/g)               (pCi/g)
 ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄ
 Cl-36   3.130E+01      92.0 ñ 0.2     5.528E-04  2.713E+04  5.528E-04  2.713E+04
 Tc-99   8.000E-01   0.4918 ñ 0.0010   3.236E-01  4.636E+01  3.236E-01  4.636E+01
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Attachment ____1____ Sheet No. 17 of 18
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

ATTACHMENT 1

```
1RESRAD, Version 6.5      T« Limit = 180 days        04/25/2011  13:26  Page  18
 Summary : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                                        Individual Nuclide Dose Summed Over All Pathways
                                         Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent   THF(i)                                         DOSE(j,t), mrem/yr
  (j)     (i)               t= 0.000E+00 5.000E-01 1.000E+00 3.000E+00 1.000E+01 3.000E+01 9.200E+01 3.000E+02 1.000E+03
 ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ     ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ
 Cl-36   Cl-36   1.000E+00     0.000E+00 9.468E-05 1.899E-04 5.705E-04 1.901E-03 5.691E-03 1.730E-02 1.646E-02 1.390E-02
 Tc-99   Tc-99   1.000E+00     4.128E-02 2.587E-01 2.536E-01 2.352E-01 1.809E-01 8.535E-02 8.321E-03 3.375E-06 1.294E-17
 ííííííí ííííííí ííííííííí     ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí
 THF(i) is the thread fraction of the parent nuclide.


                                        Individual Nuclide Soil Concentration
                                         Parent Nuclide and Branch Fraction Indicated
0Nuclide Parent   THF(i)                                         S(j,t), pCi/g
  (j)     (i)               t= 0.000E+00 5.000E-01 1.000E+00 3.000E+00 1.000E+01 3.000E+01 9.200E+01 3.000E+02 1.000E+03
 ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ     ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄ
 Cl-36   Cl-36   1.000E+00     3.130E+01 3.130E+01 3.129E+01 3.128E+01 3.122E+01 3.107E+01 3.061E+01 2.911E+01 2.458E+01
 Tc-99   Tc-99   1.000E+00     8.000E-01 7.851E-01 7.705E-01 7.149E-01 5.498E-01 2.597E-01 2.538E-02 1.038E-05 4.105E-17
 ííííííí ííííííí ííííííííí     ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí ííííííííí
 THF(i) is the thread fraction of the parent nuclide.
0RESCALC.EXE execution time =     5.01 seconds
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Attachment 1	Sheet No. 18 of 18
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

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1RESRAD, Version 6.5      T« Limit = 180 days      04/25/2011  13:26  Page   1
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

                     Table of Contents
                     ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
              Part IV: Concentration of Radionuclides
              ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ
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Concentration of radionuclides in different media

Attachment 2 Sheet No. 1 of 10
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

ATTACHMENT 2

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   2
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD
```

Concentration of radionuclides in environmental media
at t = 0.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Cl-36	3.130E+01	3.130E+01	2.825E-04	0.000E+00	0.000E+00
Tc-99	8.000E-01	8.000E-01	6.328E-06	0.000E+00	0.000E+00

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 0.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Cl-36	0.000E+00	6.260E+05	6.260E+05	6.260E+05	6.260E+05	2.555E+06	6.889E+05	0.000E+00	0.000E+00
Tc-99	0.000E+00	4.000E+03	4.000E+03	4.000E+03	4.000E+03	2.724E+01	2.204E+02	0.000E+00	0.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Attachment 2	Sheet No. 2 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   3
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

      Concentration of radionuclides in environmental media
                    at t = 5.000E-01 years

         Contaminat-  Surface   Air Par-     Well      Surface
          ted Zone     Soil*    ticulate     Water      Water
Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Nuclide     pCi/g      pCi/g    pCi/m**3     pCi/L      pCi/L
ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Cl-36     3.130E+01  3.130E+01  2.824E-04  4.304E-02  2.415E-03
Tc-99     7.851E-01  7.851E-01  6.210E-06  1.972E+02  8.146E-01
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*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.


                        Concentration of radionuclides in foodstuff media
                                  at t = 5.000E-01 years*

          Drinking   Nonleafy    Leafy      Fodder     Fodder      Meat       Milk       Fish     Crustacea
           Water    Vegetable  Vegetable     Meat       Milk
Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Nuclide     pCi/L     pCi/kg     pCi/kg     pCi/kg     pCi/kg     pCi/kg      pCi/L     pCi/kg     pCi/kg
ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Cl-36     4.280E-02  6.259E+05  6.259E+05  6.260E+05  6.259E+05  2.555E+06  6.889E+05  2.322E+00  4.413E-01
Tc-99     1.975E+02  4.621E+03  5.793E+03  5.102E+03  5.280E+03  3.572E+01  3.224E+02  1.644E+01  4.110E+00
ÍÍÍÍÍÍÍ  ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ ÍÍÍÍÍÍÍÍÍÍ
*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
 For livestock fodder, consumption time is t minus meat or milk storage time.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
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Attachment 2	Sheet No. 3 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

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1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   4
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD
```

Concentration of radionuclides in environmental media
at t = 1.000E+00 years

Radio-Nuclide	Contaminated Zone (pCi/g)	Surface Soil* (pCi/g)	Air Particulate (pCi/m**3)	Well Water (pCi/L)	Surface Water (pCi/L)
Cl-36	3.129E+01	3.129E+01	2.824E-04	8.607E-02	4.830E-03
Tc-99	7.705E-01	7.705E-01	6.095E-06	1.935E+02	7.995E-01

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+00 years*

Radio-Nuclide	Drinking Water (pCi/L)	Nonleafy Vegetable (pCi/kg)	Leafy Vegetable (pCi/kg)	Fodder Meat (pCi/kg)	Fodder Milk (pCi/kg)	Meat (pCi/kg)	Milk (pCi/L)	Fish (pCi/kg)	Crustacea (pCi/kg)
Cl-36	8.584E-02	6.259E+05	6.259E+05	6.259E+05	6.259E+05	2.555E+06	6.888E+05	4.737E+00	9.001E-01
Tc-99	1.935E+02	4.529E+03	5.681E+03	5.419E+03	5.408E+03	3.786E+01	3.288E+02	1.600E+01	4.000E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Attachment 2	Sheet No. 4 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

1RESRAD, Version 6.5 T« Limit = 180 days 04/25/2011 13:26 Page 5
Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Concentration of radionuclides in environmental media
at t = 3.000E+00 years

Radio-Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
Cl-36	3.128E+01	3.128E+01	2.823E-04	2.582E-01	1.449E-02
Tc-99	7.149E-01	7.149E-01	5.654E-06	1.795E+02	7.416E-01

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 3.000E+00 years*

Radio-Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
Cl-36	2.579E-01	6.256E+05	6.255E+05	6.256E+05	6.256E+05	2.553E+06	6.884E+05	1.439E+01	2.735E+00
Tc-99	1.795E+02	4.201E+03	5.270E+03	5.027E+03	5.017E+03	3.512E+01	3.050E+02	1.484E+01	3.711E+00

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Attachment 2 Sheet No. 5 of 10
Originator: S. W. Clark Date 4/26/2011
Chk'd By M. W. Perrott Date 4/26/2011
Calc. No. 0100H-CA-V0163 Rev. No. 0

ATTACHMENT 2

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1RESRAD, Version 6.5      T« Limit = 180 days        04/25/2011  13:26  Page   6
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

      Concentration of radionuclides in environmental media
                    at t = 1.000E+01 years

          Contaminat-  Surface   Air Par-     Well      Surface
           ted Zone     Soil*    ticulate    Water       Water
 Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
 Nuclide    pCi/g      pCi/g    pCi/m**3     pCi/L      pCi/L
 ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
 Cl-36     3.122E+01  3.122E+01  2.818E-04  8.598E-01  4.824E-02
 Tc-99     5.498E-01  5.498E-01  4.349E-06  1.380E+02  5.702E-01
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 *The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

                         Concentration of radionuclides in foodstuff media
                                   at t = 1.000E+01 years*

           Drinking   Nonleafy     Leafy      Fodder     Fodder      Meat       Milk       Fish     Crustacea
            Water    Vegetable  Vegetable     Meat        Milk
 Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
 Nuclide    pCi/L      pCi/kg     pCi/kg     pCi/kg     pCi/kg     pCi/kg     pCi/L      pCi/kg     pCi/kg
 ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
 Cl-36     8.596E-01  6.245E+05  6.245E+05  6.245E+05  6.245E+05  2.549E+06  6.873E+05  4.815E+01  9.149E+00
 Tc-99     1.380E+02  3.231E+03  4.053E+03  3.866E+03  3.858E+03  2.701E+01  2.346E+02  1.141E+01  2.853E+00
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 *Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
  For livestock fodder, consumption time is t minus meat or milk storage time.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
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Attachment 2	Sheet No. 6 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

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1RESRAD, Version 6.5      T« Limit = 180 days        04/25/2011  13:26  Page   7
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

      Concentration of radionuclides in environmental media
                       at t = 3.000E+01 years

         Contaminat- Surface   Air Par-     Well      Surface
          ted Zone    Soil*    ticulate     Water      Water
Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Nuclide     pCi/g      pCi/g   pCi/m**3     pCi/L      pCi/L
ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Cl-36     3.107E+01  3.107E+01  2.804E-04  2.573E+00  1.444E-01
Tc-99     2.597E-01  2.597E-01  2.054E-06  6.512E+01  2.690E-01
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*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.


                          Concentration of radionuclides in foodstuff media
                                     at t = 3.000E+01 years*

          Drinking   Nonleafy     Leafy     Fodder     Fodder       Meat       Milk       Fish    Crustacea
           Water    Vegetable  Vegetable    Meat       Milk
Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Nuclide     pCi/L     pCi/kg     pCi/kg     pCi/kg     pCi/kg     pCi/kg     pCi/L      pCi/kg     pCi/kg
ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Cl-36     2.573E+00  6.215E+05  6.215E+05  6.215E+05  6.215E+05  2.537E+06  6.840E+05  1.443E+02  2.741E+01
Tc-99     6.513E+01  1.526E+03  1.913E+03  1.825E+03  1.822E+03  1.275E+01  1.107E+02  5.385E+00  1.346E+00
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*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
 For livestock fodder, consumption time is t minus meat or milk storage time.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
```

Attachment 2	Sheet No. 7 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

```
1RESRAD, Version 6.5     T« Limit = 180 days       04/25/2011  13:26  Page   8
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD
```

Concentration of radionuclides in environmental media
at t = 9.200E+01 years

Radio-Nuclide	Contaminated Zone (pCi/g)	Surface Soil* (pCi/g)	Air Particulate (pCi/m**3)	Well Water (pCi/L)	Surface Water (pCi/L)
Cl-36	3.061E+01	3.061E+01	2.763E-04	7.823E+00	4.389E-01
Tc-99	2.538E-02	2.538E-02	2.007E-07	6.346E+00	2.622E-02

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 9.200E+01 years*

Radio-Nuclide	Drinking Water (pCi/L)	Nonleafy Vegetable (pCi/kg)	Leafy Vegetable (pCi/kg)	Fodder Meat (pCi/kg)	Fodder Milk (pCi/kg)	Meat (pCi/kg)	Milk (pCi/L)	Fish (pCi/kg)	Crustacea (pCi/kg)
Cl-36	7.823E+00	6.123E+05	6.122E+05	6.123E+05	6.123E+05	2.499E+06	6.738E+05	4.390E+02	8.340E+01
Tc-99	6.346E+00	1.490E+02	1.868E+02	1.782E+02	1.779E+02	1.245E+00	1.081E+01	5.247E-01	1.312E-01

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Attachment 2	Sheet No. 8 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

```
1RESRAD, Version 6.5      T« Limit = 180 days       04/25/2011  13:26  Page   9
 Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
 File    : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

      Concentration of radionuclides in environmental media
                    at t = 3.000E+02 years

         Contaminat-  Surface   Air Par-     Well      Surface
          ted Zone     Soil*    ticulate     Water      Water
Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Nuclide     pCi/g      pCi/g    pCi/m**3     pCi/L      pCi/L
ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Cl-36     2.911E+01  2.911E+01  2.627E-04  7.440E+00  4.174E-01
Tc-99     1.038E-05  1.038E-05  8.210E-11  2.569E-03  1.061E-05
ßßßßßßß  ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß
*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

                         Concentration of radionuclides in foodstuff media
                                   at t = 3.000E+02 years*

          Drinking   Nonleafy     Leafy     Fodder     Fodder      Meat        Milk        Fish     Crustacea
           Water    Vegetable  Vegetable     Meat       Milk
Radio-   ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Nuclide     pCi/L     pCi/kg     pCi/kg     pCi/kg     pCi/kg     pCi/kg      pCi/L      pCi/kg     pCi/kg
ÄÄÄÄÄÄÄ  ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ ÄÄÄÄÄÄÄÄÄÄ
Cl-36     7.440E+00  5.823E+05  5.823E+05  5.823E+05  5.823E+05  2.377E+06  6.408E+05  4.174E+02  7.931E+01
Tc-99     2.570E-03  6.087E-02  7.617E-02  7.269E-02  7.255E-02  5.077E-04  4.407E-03  2.124E-04  5.311E-05
ßßßßßßß  ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß ßßßßßßßßßß
*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
 For livestock fodder, consumption time is t minus meat or milk storage time.

 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
```

Attachment 2	Sheet No. 9 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

ATTACHMENT 2

1RESRAD, Version 6.5   T« Limit = 180 days   04/25/2011 13:26 Page 10
Concent : 116-H-5 LEAD Groundwater and Columbia River Protection
File   : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\116-H-5_LEAD.RAD

Concentration of radionuclides in environmental media
at t = 1.000E+03 years

Radio- Nuclide	Contaminated Zone pCi/g	Surface Soil* pCi/g	Air Particulate pCi/m**3	Well Water pCi/L	Surface Water pCi/L
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Cl-36	2.458E+01	2.458E+01	2.219E-04	6.283E+00	3.525E-01
Tc-99	4.105E-17	4.105E-17	3.247E-22	9.796E-15	4.047E-17
ÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ

*The Surface Soil is the top layer of soil within the user specified mixing zone/depth.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Concentration of radionuclides in foodstuff media
at t = 1.000E+03 years*

Radio- Nuclide	Drinking Water pCi/L	Nonleafy Vegetable pCi/kg	Leafy Vegetable pCi/kg	Fodder Meat pCi/kg	Fodder Milk pCi/kg	Meat pCi/kg	Milk pCi/L	Fish pCi/kg	Crustacea pCi/kg
ÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ	ÄÄÄÄÄÄÄÄÄÄ
Cl-36	6.283E+00	4.917E+05	4.917E+05	4.917E+05	4.917E+05	2.007E+06	5.411E+05	3.525E+02	6.698E+01
Tc-99	9.797E-15	2.395E-13	2.978E-13	2.846E-13	2.840E-13	1.986E-15	1.721E-14	8.100E-16	2.025E-16
ÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ	ÍÍÍÍÍÍÍÍÍÍ

*Concentrations are at consumption time and include radioactive decay and ingrowth during storage time.
For livestock fodder, consumption time is t minus meat or milk storage time.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

Attachment 2	Sheet No. 10 of 10
Originator: S. W. Clark	Date 4/26/2011
Chk'd By M. W. Perrott	Date 4/26/2011
Calc. No. 0100H-CA-V0163	Rev. No. 0

APPENDIX D

CALCULATIONS

APPENDIX D

CALCULATION BRIEFS

The calculations in this appendix are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the files will be stored in a U.S. Department of Energy, Richland Operations Office, repository. These calculations have been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculation," Washington Closure Hanford, Richland, Washington. The following calculations are provided in this appendix.

116-H-5 Waste Site Cleanup Verification 95% UCL Calculation, 0100H-CA-V0164, Rev. 0, Washington Closure Hanford, Richland, Washington.

116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations, 0100H-CA-V0165, Rev. 0, Washington Closure Hanford, Richland, Washington.

116-H-5 Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater, 0100H-CA-V0166, Rev. 0, Washington Closure Hanford, Richland, Washington.

DISCLAIMER FOR CALCULATIONS

The calculations that are provided in this appendix have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0164

Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculation

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 47 Attm. 1 = 79 Total = 127	J. D. Skoglie	T. E. Queen	**B. L. Vedder**	D. F. Obenauer	6/22/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford — **CALCULATION SHEET**

Originator J. D. Skoglie **Date** 05/17/11 **Calc. No.** 0100H-CA-V0164 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** T. E. Queen **Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 1 of 47

Summary

Purpose:

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) Model Toxics Control Act (MTCA) 3-part test for nonradionuclide analytes and calculate the relative percent difference (RPD) for primary-duplicate sample pairs for each contaminant of concern (COC) and contaminant of potential concern (COPC), as necessary.

Table of Contents:

Given/References:

1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2009b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets),* Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
10) EPA, 1989, Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A; Interim Final, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D.C.
11) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Administrative Code.*

Solution:

Calculation methodology is described in Ecology Pub. #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2009b). Use data from attached worksheets to perform the 95% UCL calculation for each analyte, the WAC 173-340-740(7)(e) 3-part test for nonradionuclides, and the RPD calculations for each COC/COPC. The hazard quotient and carcinogenic risk calculations are located in a separate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:

The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 116-H-5 waste site. The data were entered into an EXCEL 2003 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with the RDR/RAWP (DOE-RL 2009b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:

The 116-H-5 waste site underwent statistical sampling at four decision units; shallow zone, dep zone, overburden, and the staging pile area for verification sampling. Information on the re-samples taken at these locations are available in the RSVP.

Analytical results for all sampling locations are summarized in the tables provided on sheets 3, 4, and 5. Further information of the sample data quality is presented in the data quality assessment section of the associated RSVP.

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 2 of 47

Summary (continued)

Methodology, continued:

For nonradioactive analytes with ≤50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup is the 95% UCL. For nonradioactive analytes with >50% of the data below detection limits, as determined by direct inspection of the sample results (Attachment 1), the maximum detected value for the data set (which includes primary and duplicate samples) is used instead of the 95% UCL, and no further calculations are performed for those data sets. For convenience, these maximum detected values are included in the summary tables that follow. The 95% UCL was not calculated for data sets with no reported detections. Calculated cleanup levels are not available in Ecology (2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs/COPCs and are also not included in these calculations. The 95% UCL values were not calculated for potassium-40, radium-226, radium-228, thorium-228, and thorium-232 based on natural occurence at the Hanford Site.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above. For radionuclide data, calculation of the statistics is done using the reported value. In cases where the laboratory does not report a value below the minimum detectable activity (MDA), half of the MDA is used in the calculation. For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above.

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets (n < 10), the calculations are performed assuming nonparametric distribution, so no tests for distribution are performed. For nonradionuclide data sets of ten or greater, as for the subject site, distributional testing is done using Ecology's MTCAStat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2009b) and MTCAStat coding and due to a limitation in the MTCAStat coding (no direct capability to address variable quantitation limits within a data set), substitutions for censored data are performed before software input and the resulting data set treated as uncensored.

The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:
1) the 95% UCL exceeds the most stringent cleanup limit for each COPC/COC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC/COC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC/COC.

The RPD is calculated when both the primary value and either the duplicate or split value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed in Table 2-1 of the SAP (DOE-RL 2009a) for certain constituents. All other constituents will have their own pre-determined TDL's based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

$$RPD = [\,|M-S|/((M+S)/2)]*100$$

where, M = Main Sample Value S = Split (or duplicate) Sample Value

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. If the RPD is greater than 30%, further investigation regarding the usability of the data is performed. To assist in the identification of anomalous sample pairs, when an analyte is detected in the primary or duplicate/split sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate/split result exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie **Date** 05/17/11 **Calc. No.** 0100H-CA-V0164 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** T. E. Queen **Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 3 of 47

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the shallow zone, deep zone, overburden, staging pile area, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Shallow and Deep Zones					
Analyte	SZ		DZ		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Carbon-14	0.800	–	0.898	–	pCi/g
Cesium-137	–	–	0.161	–	pCi/g
Cobalt-60	–	–	0.045	–	pCi/g
Europium-152	–	–	1.37	–	pCi/g
Nickel-63	3.72	–	3.11	–	pCi/g
Total beta radiostrontium	0.357	–	–	–	pCi/g
Tritium	2.08	–	2.49	–	pCi/g
Uranium-233/234	0.633	–	0.635	–	pCi/g
Uranium-238	0.646	–	0.622	–	pCi/g
Arsenic	6.53	–	6.3	–	mg/kg
Barium	62.4	–	69.8	–	mg/kg
Beryllium	0.198	–	0.089	–	mg/kg
Boron	1.59	–	–	1.2	mg/kg
Cadmium	0.0853	–	0.089	–	mg/kg
Chromium	12.9	–	11.6	–	mg/kg
Cobalt	6.30	–	6.2	–	mg/kg
Copper	14.4	–	15.3	–	mg/kg
Hexavalent chromium	–	0.060	–	–	mg/kg
Lead	18.8	–	18.7	–	mg/kg
Manganese	269	–	255	–	mg/kg
Mercury	–	0.019	–	0.020	mg/kg
Molybdenum	0.273	–	–	0.87	mg/kg
Nickel	11.5	–	11.7	–	mg/kg
Vanadium	48.2	–	47.0	–	mg/kg
Zinc	47.2	–	43.6	–	mg/kg
Chloride	–	2.1	–	17.6	mg/kg
Fluoride	0.98	–	1.3	–	mg/kg
Nitrogen in nitrate	2.44	–	34.0	–	mg/kg
Nitrogen in nitrate and nitrite	1.90	–	31.3	–	mg/kg
Nitrogen in nitrite	–	–	–	0.40	mg/kg
Sulfate	9.2	–	55.2	–	mg/kg
Acenaphthene	–	2.79	–	–	ug/kg
Anthracene	–	7.60	–	5.1	ug/kg
Benzo(a)anthracene	20.8	–	–	54	ug/kg
Benzo(a)pyrene	18.8	–	–	41	ug/kg
Benzo(b)fluoranthene	14.0	–	–	51	ug/kg
Benzo(ghi)perylene	11.7	–	–	32	ug/kg
Benzo(k)fluoranthene	6.75	–	–	30	ug/kg
Bis(2-ethylhexl)phthalate	–	–	67	–	ug/kg
Chrysene	23.6	–	–	45	ug/kg
Dibenz[a,h]anthracene	–	2.75	–	–	ug/kg
Fluorene	–	1.57	–	–	ug/kg
Fluoranthene	66.6	–	–	69	ug/kg
Indeno(1,2,3-cd)pyrene	13.6	–	–	35	ug/kg
Naphthalene	–	15.0	–	–	ug/kg
Phenanthrene	21.7	–	–	18	ug/kg
Pyrene	25.4	–	–	77	ug/kg
Aroclor-1260	–	3.85	–	7.31	ug/kg
4,4'-DDD	–	–	–	2.12	ug/kg
4,4'-DDE	–	0.45	–	–	ug/kg
4,4'-DDT	–	–	–	3.10	ug/kg
TPH-diesel range	–	2600	–	–	ug/kg
TPH-diesel range EXT	–	8100	–	–	ug/kg
TPH-motor oil (high boiling)	13352	–	33760	–	ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	SZ		DZ	
Cleanup Limit?	YES	NO	YES	YES
> 10% above Cleanup Limit?	YES	NO	YES	YES
Any sample > 2x Cleanup Limit?	YES	NO	YES	YES

[a]The 95% UCL result or maximum value, depending on data censorship.
– = not applicable
B = blank contamination (inorganic constituents)
C = Sample was ≤5X the blank concentration
CVP = closeout verification package
D = dilution
DE = direct exposure
GW = groundwater
J = estimate
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
Q = qualifier

QA/QC = quality assurance/quality control
RAG = remedial action goal
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
SAP = sampling and analysis plan
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = Washington Administrative Code

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0164 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 4 of 47

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the shallow zone, deep zone, overburden, staging pile area, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Results Summary - Overburden and Staging Pile Area

Analyte	OB		SPA		Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	
Carbon-14	0.868	–	–	–	pCi/g
Cesium-137	–	–	0.0245	–	pCi/g
Plutonium-238	0.268	–	–	–	pCi/g
Technetium-99	–	–	0.499	–	pCi/g
Tritium	0.570	–	–	–	pCi/g
Uranium-233/234	1.16	–	0.0822	–	pCi/g
Uranium-238	0.547	–	1.10	–	pCi/g
Antimony	0.414	–	–	–	mg/kg
Arsenic	5.89	–	14.0	–	mg/kg
Barium	53.8	–	80.0	–	mg/kg
Beryllium	0.174	–	0.17	–	mg/kg
Boron	1.43	–	2.4	–	mg/kg
Cadmium	0.094	–	0.12	–	mg/kg
Chromium	11.5	–	11.0	–	mg/kg
Cobalt	5.58	–	6.9	–	mg/kg
Copper	13.6	–	14.8	–	mg/kg
Hexavalent chromium	0.16	–	–	–	mg/kg
Lead	17.0	–	33.4	–	mg/kg
Manganese	258	–	283	–	mg/kg
Mercury	–	–	–	0.014	mg/kg
Molybdenum	0.318	–	–	0.33	mg/kg
Nickel	10.8	–	10.8	–	mg/kg
Silver	–	0.156	–	–	mg/kg
Vanadium	44.4	–	48.0	–	mg/kg
Zinc	43.4	–	41.1	–	mg/kg
Chloride	–	20.6	–	9.5	mg/kg
Fluoride	0.8	–	1.0	–	mg/kg
Nitrogen in nitrate	3.0	–	15.3	–	mg/kg
Nitrogen in nitrate and nitrite	2.4	–	16.0	–	mg/kg
Sulfate	8.2	–	51.6	–	mg/kg
Acenaphthene	–	21.9	–	–	ug/kg
Acenapthylene	–	–	–	27	ug/kg
Anthracene	–	58.4		87	ug/kg
Benzo(a)anthracene	78.5	–	58	–	ug/kg
Benzo(a)pyrene	83.1	–	88.5	–	ug/kg
Benzo(b)fluoranthene	105	–	48	–	ug/kg
Benzo(ghi)perylene	62.9	–	–	96	ug/kg
Benzo(k)fluoranthene	21.9	–	23	–	ug/kg
Bis(2-ethylhexl)phthalate	–	120	121	–	ug/kg
Chrysene	113	–	47	–	ug/kg
Dibenz[a,h]anthracene	6.29	–	–	26	ug/kg
Fluoranthene	188	–	–	400	ug/kg
Fluorene	–	32.3	–	57	ug/kg
Indeno(1,2,3-cd)pyrene	83.4	–	36	–	ug/kg
Naphthalene	–	25.1	–	–	ug/kg
Phenanthrene	107	–	50	–	ug/kg
Pyrene	342	–	105	–	ug/kg
Aroclor-1254	–	–	–	15	ug/kg
Aroclor-1260	–	–	–	10	ug/kg
4,4'-DDE	–	0.45	–	40	ug/kg
4,4'-DDT	–		–	5.3	ug/kg
TPH-diesel range	–	3200	6149	–	ug/kg
TPH-diesel range EXT	–	6500	19353	–	ug/kg
TPH-motor oil (high boiling)	–	15000	147061	–	ug/kg

3-Part Test Evaluation:

95% UCL or maximum[a] >	OB		SPA	
Cleanup Limit?	YES	NO	YES	YES
> 10% above Cleanup Limit?	YES	NO	YES	YES
Any sample > 2x Cleanup Limit?	YES	NO	YES	YES

[a]The 95% UCL result or maximum value, depending on data censorship.

– = not applicable
B = blank contamination (inorganic constituents)
C = Sample was ≤5X the blank concentration
CVP = closeout verification package
D = dilution
DE = direct exposure
GW = groundwater
J = estimate
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
Q = qualifier

QA/QC = quality assurance/quality control
RAG = remedial action goal
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
SAP = sampling and analysis plan
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = Washington Administrative Code

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 5 of 47

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the shallow zone, deep zone, overburden, staging pile area, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for this site.

Relative Percent Difference Results and QA/QC Analysis[a]

Analyte	**Duplicate Analysis**			
	SZ	**DZ**	**OB**	**SPA**
Potassium-40	11.6%	0.0%	12.4%	24.3%
Radium-226	1.9%	13.7%	–	11.4%
Radium-228	7.1%	–	–	–
Aluminum	10.0%	5.7%	4.8%	3.0%
Barium	12.0%	3.0%	8.5%	10.1%
Calcium	4.8%	6.6%	12.1%	2.3%
Chromium	28.6%	16.5%	2.9%	8.7%
Copper	9.2%	13.3%	0.0%	7.6%
Iron	14.9%	4.1%	2.5%	1.5%
Magnesium	12.8%	8.3%	1.0%	7.2%
Manganese	8.2%	3.1%	4.5%	1.3%
Silicon	10.9%	13.1%	13.0%	17.3%
Vanadium	18.5%	3.3%	7.3%	6.0%
Zinc	10.9%	23.8%	3.2%	1.1%
Benzo(a)anthracene (Method 8310)	–	–	–	30.0%
Benzo(a)pyrene (Method 8310)	–	–	–	***34.5%***
Benzo(b)fluoranthene (Method 8310)	–	–	–	30.3%
Chrysene (Method 8310)	–	–	–	13.3%
Fluoranthene (Method 8310)	–	–	–	***31.9%***
Indeno (1,2,3-cd)pyrene (Method 8310)	–	–	–	8.7%
Phenanthrene (Method 8310)	–	–	–	***59.5%***
Pyrene (Method 8310)	–	–	–	28.6%
TPH motor oil (high boiling)	–	–	–	***45.6%***

[a] RPD listed where result produced, based on criteria. If RPD not required, no value is listed. The significance of the reported RPD values, including values greater than 30%, is addressed in the data quality assessment section of the RSVP.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

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1 **116-H-5 Statistical Calculations**

2 **Verification Data -Shallow Zone**

	Sample	Sample	Sample	Carbon-14			Nickel-63			Total beta radiostrontium			Tritium			Uranium-233/234			Uranium-238		
4	Area	Number	Date	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
5	SZ-2	J19YB9	5/18/10	0.701	UJ	0.814	0	U	3.08	0	U	0.316	2.83	J	2.55	0.77		0.226	0.681		0.226
6	Duplicate of J19YB9	J19YD0	5/18/10	1.20		0.938	0.357	U	2.66	0	U	0.236	0	U	3.15	0.930		0.178	0.768		0.178
7	SZ-1	J19YB8	5/18/10	0.772	UJ	0.882	0	U	3.17	0	U	0.303	4.84	J	2.66	0.266		0.157	0.225		0.157
8	SZ-3	J19YC0	5/18/10	0.773	UJ	0.799	0.638	U	2.96	0.00100	U	0.277	3.97	J	2.63	0.395		0.233	0.426		0.233
9	SZ-4	J19YC1	5/18/10	0.946	J	0.802	0	U	3.32	0	U	0.296	4.01	J	2.53	0.326		0.226	0.444		0.226
10	SZ-5	J19YC2	5/18/10	0.809	UJ	0.970	0	U	3.22	0.0280	U	0.257	3.72	J	2.63	0.811		0.222	0.753		0.222
11	SZ-6	J19YC3	5/18/10	0.603	UJ	0.893	0	U	3.02	0	U	0.264	4.70	J	2.78	0.739		0.202	0.739		0.202
12	SZ-7	J19YC4	5/18/10	0.874	J	0.805	0	U	2.90	0.0120	U	0.281	5.90	J	2.59	0.594		0.216	0.678		0.216
13	SZ-8	J19YC5	5/18/10	0.521	UJ	0.916	0	U	2.98	2.40		0.242	0.994	J	2.73	0.724		0.213	0.669		0.213
14	SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.000142	U	0.463	0	U	13.8	0	U	0.174	0.0527		0.0245	0.0792	U	0.114	0.214		0.123
15	SZ-10	J19YC7	5/18/10	0.520	UJ	0.801	1.05	U	2.96	0	U	0.251	3.75	J	2.64	0.609		0.245	0.833		0.245
16	SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0	U	0.464	18.5		14.6	0	U	0.193	0.0530		0.0137	0.196		0.123	0.454		0.137
17	SZ-12	J19YC9	5/18/10	0.951		0.867	1.28	U	2.97	0	U	0.252	0	U	2.97	0.552		0.156	0.368		0.156

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Carbon-14	Nickel-63	Total beta radiostrontium	Tritium	Uranium-233/234	Uranium-238
21	Area	Number	Date	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g
22	SZ-2	J19YB9/ J19YD0	5/18/10	0.951	0.179	0	1.42	0.850	0.725
23	SZ-1	J19YB8	5/18/10	0.772	0	0	4.84	0.266	0.225
24	SZ-3	J19YC0	5/18/10	0.773	0.638	0	3.97	0.395	0.426
25	SZ-4	J19YC1	5/18/10	0.946	0	0	4.01	0.326	0.444
26	SZ-5	J19YC2	5/18/10	0.809	0	0.0280	3.72	0.811	0.753
27	SZ-6	J19YC3	5/18/10	0.603	0	0	4.70	0.739	0.739
28	SZ-7	J19YC4	5/18/10	0.874	0	0.0120	5.90	0.594	0.678
29	SZ-8	J19YC5	5/18/10	0.521	0	2.40	0.994	0.724	0.669
30	SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0	0	0	0.0527	0.079	0.214
31	SZ-10	J19YC7	5/18/10	0.520	1.05	0	3.75	0.609	0.833
32	SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0	18.5	0	0.0530	0.196	0.454
33	SZ-12	J19YC9	5/18/10	0.951	1.28	0	0	0.552	0.368

34 **Statistical Computations**

35		Carbon-14	Nickel-63	Total beta radiostrontium	Tritium	Uranium-233/234	Uranium-238
36	95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
37	N	12	12	12	12	12	12
38	% < Detection limit	67%	92%	92%	8%	8%	0%
39	Mean	0.640	1.21	0.0290	1.07	0.512	0.544
40	Standard deviation	0.338	5.28	0.692	2.13	0.255	0.214
41	Z-statistic	1.64	1.64	1.64	1.64	1.64	1.64
42	95% UCL on mean	0.800	3.72	0.357	2.08	0.633	0.646
43	Maximum value	1.20	18.5	2.40	5.90	0.930	0.833

Footnotes apply to all calculations sheets and attachment 1.

[a] Location re-sampled due to RAG exceedance. All replaced data is shown in attachment 1 and is for information only. Re-sample strategy is further explained in the RSVP.

[b] Nitrate, nitrite, and phosphate were converted to nitrogen in nitrate, nitrogen in nitrite, and phosphorus in phosphate respectively.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
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116-H-5 Statistical Calculations

Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	4.27		0.907	67.8		0.453	0.263		0.181	1.22	B	1.81	0.227	U	0.227	21.2		0.907	6.33		2.72	12.5		1.81	4.66		0.907	278		0.907
Duplicate of J19YB9	J19YD0	5/18/10	3.99		0.695	60.1		0.348	0.232		0.139	1.11	B	1.39	0.073	B	0.174	15.9		0.695	5.42		2.09	11.4		1.39	5.41		0.695	256		0.695
SZ-1	J19YB8	5/18/10	2.13		0.742	33.6		0.371	0.13	B	0.148	0.759	B	1.48	0.0410	B	0.186	8.93		0.742	4.91		2.23	12.2		1.48	3.44		0.742	227		0.742
SZ-3	J19YC0	5/18/10	2.83		0.801	69.8		0.401	0.208		0.160	3.44		1.60	0.0861	B	0.200	12.7		0.801	5.79		2.40	13.1		1.60	8.37		0.801	268		0.801
SZ-4	J19YC1	5/18/10	5.32		0.902	51.9		0.451	0.172	B	0.180	1.26	B	1.80	0.0649	B	0.225	10.4		0.902	6.11		2.71	16.1		1.80	15.2		0.902	257		0.902
SZ-5	J19YC2	5/18/10	6.45		0.767	46.7		0.383	0.192		0.153	1.12	B	1.53	0.0602	B	0.192	11.0		0.767	5.45		2.30	13.0		1.53	15.9		0.767	263		0.767
SZ-6	J19YC3	5/18/10	3.75		0.837	63.4		0.418	0.216		0.167	1.26	B	1.67	0.0586	B	0.209	12.8		0.837	6.41		2.51	12.8		1.67	6.41		0.837	274		0.837
SZ-7	J19YC4	5/18/10	6.58		0.378	52.0		0.486	0.193	B	0.194	1.18	B	1.94	0.0522	B	0.243	11.7		0.971	5.82		2.91	13.3		1.94	17.3		0.971	272		0.971
SZ-8	J19YC5	5/18/10	4.84		0.753	62.2		0.377	0.206		0.151	1.34	B	1.51	0.101	B	0.188	12.6		0.753	5.65		2.26	12.0		1.51	15.1		0.753	270		0.753
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	4.80		0.630	69.6		0.073	0.110	BM	0.032	1.00	B	0.940	0.0740	BM	0.0390	9.90	X	0.055	6.60	X	0.095	17.3		0.21	8.00		0.260	284	X	0.095
SZ-10	J19YC7	5/18/10	7.65		0.678	54.8		33.9	0.181		0.136	0.967	B	1.36	0.0594	B	0.170	10.2		0.678	5.60		2.04	14.3		1.36	24.2		0.678	266		0.678
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	1.10		0.580	43.0		0.066	0.029	U	0.029	0.860	U	0.860	0.0700	B	0.0360	5.3	X	0.051	7.60	X	0.087	14.5		0.19	2.30		0.240	234	X	0.087
SZ-12	J19YC9	5/18/10	3.06		0.859	50.7		0.430	0.155	B	0.172	1.00	B	1.72	0.105	B	0.215	13.1		0.859	5.38		2.58	12.5		1.72	5.80		0.859	251		0.859

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
SZ-2	J19YB9/ J19YD0	5/18/10	4.13	64.0	0.248	1.17	0.0933	18.6	5.88	12.0	5.04	267
SZ-1	J19YB8	5/18/10	2.13	33.6	0.130	0.759	0.0410	8.9	4.91	12.2	3.44	227
SZ-3	J19YC0	5/18/10	2.83	69.8	0.208	3.44	0.0861	12.7	5.79	13.1	8.37	268
SZ-4	J19YC1	5/18/10	5.32	51.9	0.172	1.26	0.0649	10.4	6.11	16.1	15.2	257
SZ-5	J19YC2	5/18/10	6.45	46.7	0.192	1.12	0.0602	11.0	5.45	13.0	15.9	263
SZ-6	J19YC3	5/18/10	3.8	63.4	0.216	1.26	0.0586	12.8	6.41	12.8	6.41	274
SZ-7	J19YC4	5/18/10	6.58	52.0	0.193	1.18	0.0522	11.7	5.82	13.3	17.3	272
SZ-8	J19YC5	5/18/10	4.84	62.2	0.206	1.34	0.101	12.6	5.65	12.0	15.1	270
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	4.80	69.6	0.110	1.00	0.0740	9.90	6.60	17.3	8.00	284
SZ-10	J19YC7	5/18/10	7.65	54.8	0.181	0.967	0.0594	10.2	5.60	14.3	24.2	266
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	1.10	43.0	0.015	0.430	0.0700	5.30	7.60	14.5	2.30	234
SZ-12	J19YC9	5/18/10	3.06	50.7	0.155	1.00	0.105	13.1	5.38	12.5	5.80	251

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	8%	8%	0%	0%	0%	0%	0%	0%
Mean	4.39	55.1	0.169	1.24	0.0721	11.4	5.93	13.6	10.59	261
Standard deviation	1.94	11.0	0.0615	0.736	0.0202	3.12	0.694	1.68	6.76	16.6
95% UCL on mean	6.53	62.4	0.198	1.59	0.0853	12.9	6.30	14.4	18.8	269
Maximum value	7.65	69.8	0.263	3.44	0.105	21.2	7.60	17.3	24.2	284
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NO	NA	NA	YES	NA
> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NO	NA	NA	YES	NA
Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NO	NA	NA	YES	NA
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0164 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 8 of 47

116-H-5 Statistical Calculations

Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.294	B	0.907	15.6		2.27	52.6		0.91	37.8		2.72
Duplicate of J19YB9	J19YD0	5/18/10	0.243	B	0.695	12.2		1.74	43.7		0.70	33.9		2.09
SZ-1	J19YB8	5/18/10	0.252	B	0.742	8.94		1.86	42.9		0.74	29.0		2.23
SZ-3	J19YC0	5/18/10	0.271	B	0.801	10.9		2.00	47.0		0.80	68.7		2.40
SZ-4	J19YC1	5/18/10	0.276	B	0.902	9.84		2.25	46.8		0.90	38.0		2.71
SZ-5	J19YC2	5/18/10	0.233	B	0.767	10.0		1.92	46.1		0.77	33.4		2.30
SZ-6	J19YC3	5/18/10	0.321	B	0.837	10.8		2.09	52.8		0.84	39.2		2.51
SZ-7	J19YC4	5/18/10	0.260	B	0.971	10.0		2.43	49.4		0.97	35.8		2.91
SZ-8	J19YC5	5/18/10	0.252	B	0.753	10.2		1.88	45.2		0.75	69.8		2.26
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.250	U	0.250	11.1	X	0.12	42.6		0.090	35.2	X	0.38
SZ-10	J19YC7	5/18/10	0.250	B	0.678	9.63		1.70	45.4		0.68	34.8		2.04
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.230	U	0.230	11.5	X	0.11	47.4		0.082	34.3	X	0.35
SZ-12	J19YC9	5/18/10	0.298	B	0.859	12.5		2.15	46.6		0.86	35.5		2.58

Sample Area	Sample Number	Sample Date	Benzo(a)anthracene ug/kg	Q	PQL	Benzo(a)pyrene ug/kg	Q	PQL	Benzo(b)fluoranthene ug/kg	Q	PQL	Benzo(ghi)perylene ug/kg	Q	PQL	Benzo(k)fluoranthene ug/kg	Q	PQL	Chrysene ug/kg	Q	PQL
SZ-2	J19YB9	5/18/10	3.87	U	3.87	3.87	U	3.87	1.16	J	3.87	3.87	U	3.87	3.87	U	3.87	3.87	U	3.87
Duplicate of J19YB9	J19YD0	5/18/10	0.858	J	3.43	1.20	J	3.43	1.54	J	3.43	1.03	J	3.43	3.43	U	3.43	3.43	U	3.43
SZ-1	J19YB8	5/18/10	1.05	J	3.51	3.51	U	3.51	0.878	J	3.51	3.51	U	3.51	3.51	U	3.51	1.05	J	3.51
SZ-3	J19YC0	5/18/10	4.71		3.36	5.05		3.36	6.73		3.36	3.87		3.36	2.52	J	3.36	5.38		3.36
SZ-4	J19YC1	5/18/10	7.32		3.48	6.97		3.48	11.3		3.48	3.48	U	3.48	3.49		3.48	8.37		3.48
SZ-5	J19YC2	5/18/10	8.99		3.52	8.99		3.52	9.17		3.52	6.52		3.52	3.88		3.52	11.5		3.52
SZ-6	J19YC3	5/18/10	3.11	J	3.45	3.98		3.45	7.95		3.45	3.63		3.45	1.73	J	3.45	2.94	J	3.45
SZ-7	J19YC4	5/18/10	11.2		3.49	11.4		3.49	18.4		3.49	10.1		3.49	5.77		3.49	16.4		3.49
SZ-8	J19YC5	5/18/10	6.59		3.46	8.15		3.46	12.0		3.46	9.36		3.46	3.99		3.46	4.68		3.46
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	10.0	J	3.40	11.0	J	6.80	5.70	JX	4.40	7.60	U	7.60	5.80	J	4.20	10.0	J	5.10
SZ-10	J19YC7	5/18/10	15.5		3.43	15.8		3.43	24.9		3.43	23.4		3.43	8.59		3.43	12.2		3.43
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	23.0		3.20	18.0		6.40	20.0		4.20	7.20	U	7.20	10.0	J	4.00	18.0	J	4.90
SZ-12	J19YC9	5/18/10	3.40	U	3.40	1.19	J	3.40	1.19	J	3.40	3.40	U	3.40	3.40	U	3.40	0.851	J	3.40

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	Benzo(a)anthracene ug/kg	Benzo(a)pyrene ug/kg	Benzo(b)fluoranthene ug/kg	Benzo(ghi)perylene ug/kg	Benzo(k)fluoranthene ug/kg	Chrysene ug/kg
SZ-2	J19YB9/ J19YD0	5/18/10	0.269	13.9	48.2	35.9	1.40	1.57	1.35	1.48	1.83	1.83
SZ-1	J19YB8	5/18/10	0.252	8.94	42.9	29.0	1.05	1.76	0.88	1.76	1.76	1.05
SZ-3	J19YC0	5/18/10	0.271	10.9	47.0	68.7	4.71	5.05	6.73	3.87	2.52	5.38
SZ-4	J19YC1	5/18/10	0.276	9.84	46.8	38.0	7.32	6.97	11.3	1.74	3.49	8.37
SZ-5	J19YC2	5/18/10	0.233	10.0	46.1	33.4	8.99	8.99	9.17	6.52	3.88	11.5
SZ-6	J19YC3	5/18/10	0.321	10.8	52.8	39.2	3.11	3.98	7.95	3.63	1.73	2.94
SZ-7	J19YC4	5/18/10	0.260	10.0	49.4	35.8	11.2	11.4	18.4	10.1	5.77	16.4
SZ-8	J19YC5	5/18/10	0.252	10.2	45.2	69.8	6.59	8.15	12.0	9.36	3.99	4.68
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.125	11.1	42.6	35.2	10.0	11.0	5.70	3.80	5.80	10.0
SZ-10	J19YC7	5/18/10	0.250	9.63	45.4	34.8	15.5	15.8	24.9	23.4	8.59	12.2
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.115	11.5	47.4	34.3	23.0	18.0	20.0	3.60	10.0	18.0
SZ-12	J19YC9	5/18/10	0.298	12.5	46.6	35.5	1.70	1.19	1.19	1.70	1.70	0.851

Statistical Computations

	Molybdenum	Nickel	Vanadium	Zinc	Benzo(a)anthracene
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12
% < Detection limit	17%	0%	0%	0%	8%
Mean	0.243	10.8	46.7	40.8	7.88
Standard deviation	0.0622	1.36	2.74	13.5	6.50
95% UCL on mean	0.273	11.5	48.2	47.2	20.8
Maximum value	0.321	15.6	52.8	69.8	23.0
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	8 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	15 ug/kg GW & River Protection
WAC 173-340 3-PART TEST					
95% UCL > Cleanup Limit?	NO	NA	NA	NO	YES
> 10% above Cleanup Limit?	NO	NA	NA	YES	YES
Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NO
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	12	12	12	12	12
% < Detection limit	8%	0%	42%	25%	8%
Mean	7.82	10.0	5.91	4.25	7.77
Standard deviation	5.52	7.79	6.23	2.79	5.92
95% UCL on mean	18.8	14.0	11.7	6.75	23.6
Maximum value	18.0	24.9	23.4	10.0	18.0
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	48000 ug/kg GW & River Protection	15 ug/kg GW & River Protection	100 ug/kg GW & River Protection
WAC 173-340 3-PART TEST					
95% UCL > Cleanup Limit?	YES	NO	NO	NO	NO
> 10% above Cleanup Limit?	YES	YES	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO
WAC 173-340 Compliance?	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator: J. D. Skoglie
Project: 100-H Field Remediation
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations
Date: 05/17/11
Job No.: 14655
Calc. No.: 0100H-CA-V0164
Checked: T. E. Queen
Rev. No.: 0
Date: 05/17/11
Sheet No.: 9 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Shallow Zone**

3	Sample	Sample	Sample	Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in Nitrite and Nitrate			Sulfate			TPH-motor oil (high boiling)		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
5	SZ-2	J19YB9	5/18/10	3.87	U	3.87	3.87	U	3.87	1.16	J	3.87	3.87	U	3.87	0.70	B	2.8	0.59	JB	0.63	0.49		0.22	2.6	B	2.8	11500	UJ	11500
6	Duplicate of J19YB9	J19YD0	5/18/10	2.57	J	3.43	3.43	U	3.43	1.20	J	3.43	3.43	U	3.43	0.80	B	2.5	0.84		0.56	0.62		0.19	3.2		2.5	10200	U	10200
7	SZ-1	J19YB8	5/18/10	2.46	J	3.51	3.51	U	3.51	1.58	J	3.51	1.23	J	3.51	0.50	B	2.6	0.84	J	0.59	1.4		0.22	3.2		2.6	10500	UJ	10500
8	SZ-3	J19YC0	5/18/10	21.4		3.36	4.54		3.36	7.57		3.36	14.5		3.36	0.70	B	2.2	0.18	JB	0.50	0.15	B	0.19	1.9	B	2.2	27600	J	9940
9	SZ-4	J19YC1	5/18/10	19.9		3.48	7.15		3.48	5.93		3.48	17.3		3.48	0.80	B	2.6	1.06	J	0.59	0.69		0.22	4.6		2.6	4760	J	10300
10	SZ-5	J19YC2	5/18/10	31.2		3.52	6.70		3.52	11.6		3.52	23.1		3.52	0.40	B	2.5	1.81	J	0.56	1.17		0.21	5.4		2.5	10600	UJ	10600
11	SZ-6	J19YC3	5/18/10	9.34		3.45	5.01		3.45	3.98		3.45	6.40		3.45	0.40	B	2.6	1.94	J	0.59	1.03		0.22	10.2		2.6	4330	J	10000
12	SZ-7	J19YC4	5/18/10	27.1		3.49	9.97		3.49	10.5		3.49	29.4		3.49	0.90	B	2.5	0.75	J	0.56	0.67		0.20	6.2		2.5	4900	J	10400
13	SZ-8	J19YC5	5/18/10	25.0		3.46	8.32		3.46	9.88		3.46	16.5		3.46	0.90	B	2.5	3.37	J	0.56	2.43		0.20	14.3		2.5	3850	J	10300
	SZ-9	J19YC6	5/18/10																									29900	J	10200
14	SZ-9 re-sample 1[a]	J1FKL4	3/16/11	14.0	U	14.0	13.0	U	13.0	13.0	U	13.0	14.0	J	13.0	1.5	B	0.88	1.10	B	0.34	0.53	BMN	0.38	5.8		1.8			
15	SZ-10	J19YC7	5/18/10	38.5		3.43	16.8		3.43	10.8		3.43	39.4		3.43	0.50	B	2.4	2.08	J	0.54	1.68		0.22	9.3		2.4	4620	J	10200
	SZ-11	J19YC8	5/18/10																									6290	J	10300
16	SZ-11 re-sample 1[a]	J1FKL5	3/16/11	48.0		13.0	14.0	J	12.0	31.0	J	12.0	47.0		12.0	0.81	U	0.81	0.40	B	0.31	0.37	U	0.37	2.1	B	1.7			
17	SZ-12	J19YC9	5/18/10	3.06	J	3.4	3.40	U	3.40	1.53	J	3.4	3.40	U	3.40	2.3	U	2.30	0.77		0.52	0.52		0.19	2.6		2.3	10200	U	10200

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH-motor oil (high boiling)
21	Area	Number	Date	ug/kg	ug/kg	ug/kg	ug/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg
22	SZ-2	J19YB9/ J19YD0	5/18/10	2.25	1.83	1.18	1.83	0.75	0.71	0.56	2.9	5425
23	SZ-1	J19YB8	5/18/10	2.46	1.76	1.58	1.23	0.50	0.84	1.40	3.2	5250
24	SZ-3	J19YC0	5/18/10	21.4	4.54	7.57	14.5	0.70	0.18	0.15	1.9	27600
25	SZ-4	J19YC1	5/18/10	19.9	7.15	5.93	17.3	0.80	1.06	0.69	4.6	4760
26	SZ-5	J19YC2	5/18/10	31.2	6.70	11.6	23.1	0.40	1.81	1.17	5.4	5300
27	SZ-6	J19YC3	5/18/10	9.34	5.01	3.98	6.40	0.40	1.94	1.03	10.2	4330
28	SZ-7	J19YC4	5/18/10	27.1	9.97	10.5	29.4	0.90	0.75	0.67	6.2	4900
29	SZ-8	J19YC5	5/18/10	25.0	8.32	9.88	16.5	0.90	3.37	2.43	14.3	3850
	SZ-9	J19YC6	5/18/10									29900
30	SZ-9 re-sample 1[a]	J1FKL4	3/16/11	7.00	6.50	6.50	14.0	1.50	1.10	0.53	5.8	
31	SZ-10	J19YC7	5/18/10	38.5	16.8	10.8	39.4	0.50	2.08	1.68	9.3	4620
	SZ-11	J19YC8	5/18/10									6290
32	SZ-11 re-sample 1[a]	J1FKL5	3/16/11	48.0	14.0	31.0	47.0	0.41	0.40	0.19	2.1	
33	SZ-12	J19YC9	5/18/10	3.06	1.70	1.53	1.70	1.15	0.77	0.52	2.6	5100

34 **Statistical Computations**

35		Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH-motor oil (high boiling)
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12
38	% < Detection limit	8%	33%	8%	17%	17%	0%	8%	0%	33%
39	Mean	19.6	7.0	8.5	17.7	0.74	1.25	0.92	5.7	8944
40	Standard deviation	15.1	4.8	8.0	14.9	0.34	0.90	0.66	3.8	9284
41	95% UCL on mean	66.6	13.6	21.7	25.4	0.98	2.44	1.90	9.2	13352
42	Maximum value	48.0	16.8	31.0	47.0	1.5	3.37	2.43	14.3	27600
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	18000 ug/kg River Protection	330 ug/kg GW & River Protection	240000 ug/kg GW Protection	48000 ug/kg GW Protection	96 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection	200000 ug/kg DE, GW & River Protection
44	WAC 173-340 3-PART TEST									
45	95% UCL > Cleanup Limit?	NO	NO	NO	NO	NA	NA	NA	NA	NO
46	> 10% above Cleanup Limit?	NO	NO	NO	NO	NA	NA	NA	NA	NO
47	Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NA	NA	NA	NA	NO
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 10 of 47

116-H-5 Maximum Calculations
Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Hexavalent chromium			Mercury			Acenaphthene			Anthracene			Dibenz[a,h]anthracene			Fluorene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.230	U	0.230	0.015	B	0.030	3.87	U	3.87	3.87	U	3.87	3.87	U	3.87	3.87	U	3.87
Duplicate of J19YB9	J19YD0	5/18/10	0.210	U	0.210	0.027	U	0.027	3.43	U	3.43	3.43	U	3.43	3.43	U	3.43	3.43	U	3.43
SZ-1	J19YB8	5/18/10	0.060	B	0.210	0.026	U	0.026	3.51	U	3.51	3.51	U	3.51	3.51	U	3.51	3.51	U	3.51
SZ-3	J19YC0	5/18/10	0.200	U	0.200	0.019	B	0.030	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36	3.36	U	3.36
SZ-4	J19YC1	5/18/10	0.210	U	0.210	0.026	U	0.026	2.79	J	3.48	3.48	U	3.48	2.62	J	3.48	3.48	U	3.48
SZ-5	J19YC2	5/18/10	0.210	U	0.210	0.024	U	0.24	3.52	U	3.52	3.52	U	3.52	1.23	J	3.52	3.52	U	3.52
SZ-6	J19YC3	5/18/10	0.210	U	0.210	0.018	B	0.030	3.45	U	3.45	3.45	U	3.45	3.45	U	3.45	3.45	U	3.45
SZ-7	J19YC4	5/18/10	0.210	U	0.210	0.030	U	0.030	3.49	U	3.49	2.45	J	3.49	2.10	J	3.49	1.57	J	3.49
SZ-8	J19YC5	5/18/10	0.210	U	0.210	0.027	U	0.027	3.46	U	3.46	1.04	J	3.46	1.56	J	3.46	0.867	J	3.46
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.145	U	0.145	0.0054	U	0.0054	11.0	U	11.0	3.20	U	3.20	12.0	U	12.0	5.60	U	5.60
SZ-10	J19YC7	5/18/10	0.210	U	0.210	0.011	B	0.020	3.43	U	3.43	2.23	J	3.43	2.75	J	3.43	1.03	J	3.43
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.146	U	0.146	0.0050	U	0.0050	10.0	U	10.0	7.60	J	3.10	11.0	U	11.0	5.30	U	5.30
SZ-12	J19YC9	5/18/10	0.210	U	0.210	0.027	U	0.027	3.4	U	3.4	3.40	U	3.40	3.40	U	3.40	3.40	U	3.40

Statistical Computations

	Hexavalent chromium	Mercury	Acenaphthene	Anthracene	Dibenz[a,h]anthracene	Fluorene
% < Detection limit	92%	67%	92%	67%	58%	75%
Maximum value	0.060	0.019	2.79	7.60	2.75	1.57
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	2 River Protection	0.33 GW & River Protection	96000 ug/kg GW Protection	240000 ug/kg GW Protection	30 ug/kg GW & River Protection	64000 ug/kg GW Protection
3-PART TEST						
Maximum > Cleanup Limit?	NO	NA	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NA	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NA	NO	NO	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3 part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3 part test criteria when compared to the most stringent RAG.

116-H-5 Maximum Calculations
Verification Data -Shallow Zone

Sample Area	Sample Number	Sample Date	Naphthalene			Aroclor-1260			4,4'-DDE			TPH-diesel range			TPH-diesel range EXT			Chloride		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	3.87	U	3.87	14.6	U	14.6	1.46	UD	1.46	3830	U	3830				2.8	U	2.8
Duplicate of J19YB9	J19YD0	5/18/10	3.43	U	3.43	13.7	U	13.7	1.37	UD	1.37	3410	U	3410				2.5	U	2.5
SZ-1	J19YB8	5/18/10	3.51	U	3.51	13.8	U	13.8	1.38	UD	1.38	3490	U	3490				2.6	U	2.6
SZ-3	J19YC0	5/18/10	15.0		3.36	3.85	J	13.4	1.34	UD	1.34	3310	U	3310				2.2	U	2.2
SZ-4	J19YC1	5/18/10	3.48	U	3.48	13.8	U	13.8	1.39	UD	1.39	3430	U	3430				2.6	U	2.6
SZ-5	J19YC2	5/18/10	3.52	U	3.52	13.5	U	13.5	1.35	UD	1.35	3530	U	3530				2.5	U	2.5
SZ-6	J19YC3	5/18/10	3.45	U	3.45	13.7	U	13.7	1.37	UD	1.37	3350	U	3350				2.6	U	2.6
SZ-7	J19YC4	5/18/10	3.49	U	3.49	13.6	U	13.6	1.36	UD	1.36	3480	U	3480				2.5	U	2.5
SZ-8	J19YC5	5/18/10	3.46	U	3.46	13.7	U	13.7	1.37	UD	1.37	3440	U	3440				2.5	U	2.5
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	13.0	U	13.0	2.70	U	2.70	0.25	U	0.25	2600	J	720	8100		1100	2.1	B	2.1
SZ-10	J19YC7	5/18/10	3.43	U	3.43	13.5	U	13.5	1.36	UD	1.36	3410	U	3410				2.4	U	2.4
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	12.0	U	12.0	2.70	U	2.70	0.45	J	0.24	700	U	700	1200	J	1000	2.0	U	2.0
SZ-12	J19YC9	5/18/10	3.40	U	3.40	13.7	U	13.7	1.37	UD	1.37	3420	U	3420				2.3	U	2.3

Statistical Computations

	Naphthalene	Aroclor-1260	4,4'-DDE	TPH-diesel range	TPH-diesel range EXT	Chloride
% < Detection limit	92%	92%	92%	92%	0%	92%
Maximum value	15.0	3.85	0.45	2600	8100	2.1
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	16000 ug/kg GW Protection	17 ug/kg GW & River Protection	3.3 ug/kg River Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection	25000 GW Protection
3-PART TEST						
Maximum > Cleanup Limit?	NO	NO	NO	NO	NO	NA
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NA
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NA
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3 part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (100 mg/kg) the 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie **Date** 05/17/11 **Calc. No.** 0100H-CA-V0164 **Rev. No.** 0

Project 100-H Field Remediation **Job No.** 14655 **Checked** T. E. Queen **Date** 05/17/11

Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 11 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Deep Zone**

3	Sample	Sample	Sample	Carbon-14			Cesium-137			Cobalt-60			Europium-152			Nickel-63			Tritium			Uranium-233/234			Uranium-238		
4	Area	Number	Date	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
5	DZ-1	J19YD1	5/18/10	0.718	UJ	0.918	0.069	U	0.069	0.086	U	0.086	0.174	U	0.174	0	U	2.97	4.53	J	2.71	0.766		0.279	0.620		0.279
6	Duplicate of J19YD1	J19YF3	5/18/10	0.903		0.883	0.074	U	0.074	0.085	U	0.085	0.192	U	0.192	0.440	U	2.98	0.202	U	3.10	0.567		0.181	0.543		0.181
7	DZ-2	J19YD2	5/18/10	0.203	UJ	0.850	0.089	U	0.089	0.082	U	0.082	0.240	U	0.240	0	U	3.03	2.13	UJ	2.60	0.318		0.244	0.510		0.244
8	DZ-3	J19YD3	5/18/10	1.23	J	0.881	0.095	U	0.095	0.108	U	0.108	0.230	U	0.230	0.524	U	3.17	1.79	UJ	2.58	0.380		0.242	0.570		0.242
9	DZ-4	J19YD4	5/18/10	0.534	UJ	0.841	0.078	U	0.078	0.103	U	0.103	0.209	U	0.209	0	U	3.02	2.55	UJ	2.64	0.395		0.202	0.501		0.202
10	DZ-5	J19YD5	5/18/10	0.267	UJ	0.961	0.056	U	0.056	0.068	U	0.068	0.162	U	0.162	0.0870	U	3.44	1.72	UJ	2.76	0.870		0.215	0.533		0.215
11	DZ-6	J19YD6	5/18/10	1.15	J	0.809	0.089	U	0.089	0.087	U	0.087	0.182	U	0.182	0	U	3.11	2.32	UJ	2.55	0.702		0.244	0.766		0.244
12	DZ-7	J19YD7	5/18/10	0.725	UJ	0.830	0.594		0.087	0.145		0.076	2.28		0.200	13.2		3.19	4.34	J	2.59	0.648		0.236	0.833		0.236
13	DZ-8	J19YD8	5/18/10	0.513	UJ	0.881	0.071	U	0.071	0.086	U	0.086	0.198	U	0.198	0	U	3.05	1.06	UJ	2.65	0.430		0.206	0.349		0.206
14	DZ-9	J19YD9	5/18/10	0.581	UJ	0.860	0.114	U	0.114	0.095	U	0.095	0.280	U	0.280	0	U	2.96	1.91	UJ	2.62	0.709		0.209	0.546		0.209
15	DZ-10	J19YF0	5/18/10	0.509	UJ	0.800	0.055	U	0.055	0.072	U	0.072	0.181	U	0.181	0.914	U	3.00	2.53	J	2.53	0.594		0.182	0.570		0.182
16	DZ-11	J19YF1	5/18/10	1.41		0.901	0.066	U	0.066	0.055	U	0.055	0.182	U	0.182	1.50	U	2.80	1.06	U	2.96	0.371		0.149	0.488		0.149
17	DZ-12	J19YF2	5/18/10	0.766	U	0.900	0.078	U	0.078	0.086	U	0.086	0.183	U	0.183	1.40	U	2.75	0.297	U	3.03	0.553		0.184	0.481		0.184

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Carbon-14	Cesium-137	Cobalt-60	Europium-152	Nickel-63	Tritium	Uranium-233/234	Uranium-238
21	Area	Number	Date	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g
22	DZ-1	J19YD1/ J19YF3	5/18/10	0.811	0.036	0.043	0.092	0.220	2.37	0.667	0.582
23	DZ-2	J19YD2	5/18/10	0.203	0.045	0	0.120	0	2.13	0.318	0.510
24	DZ-3	J19YD3	5/18/10	1.23	0.048	0	0.115	0.524	1.79	0.380	0.570
25	DZ-4	J19YD4	5/18/10	0.534	0.039	0.052	0.105	0	2.55	0.395	0.501
26	DZ-5	J19YD5	5/18/10	0.267	0.028	0.034	0.081	0.0870	1.72	0.870	0.533
27	DZ-6	J19YD6	5/18/10	1.15	0.045	0	0.091	0	2.32	0.702	0.766
28	DZ-7	J19YD7	5/18/10	0.725	0.594	0.145	2.28	13.2	4.34	0.648	0.833
29	DZ-8	J19YD8	5/18/10	0.513	0.036	0.043	0.099	0	1.06	0.430	0.349
30	DZ-9	J19YD9	5/18/10	0.581	0.057	0.048	0.140	0	1.91	0.709	0.546
31	DZ-10	J19YF0	5/18/10	0.509	0.028	0.036	0.091	0.914	2.53	0.594	0.570
32	DZ-11	J19YF1	5/18/10	1.41	0.033	0	0.091	1.50	1.06	0.371	0.488
33	DZ-12	J19YF2	5/18/10	0.766	0.039	0.043	0.092	1.40	0.297	0.553	0.481

34 **Statistical Computations**

35		Carbon-14	Cesium-137	Cobalt-60	Europium-152	Nickel-63	Tritium	Uranium-233/234	Uranium-238
36	95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	67%	92%	92%	92%	92%	75%	0%	0%
39	Mean	0.720	0.085	0.029	1.07	1.34	2.01	0.553	0.561
40	Standard deviation	0.375	0.160	0.034	0.629	3.73	1.00	0.173	0.128
41	Z-statistic	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
42	95% UCL on mean	0.898	0.161	0.045	1.37	3.11	2.49	0.635	0.622
43	Maximum value	1.41	0.594	0.145	2.28	13.2	4.53	0.870	0.833

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 12 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Deep Zone**

	Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Cadmium			Chromium			Cobalt			Copper			Lead		
4				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	DZ-8 re-sample 2[a]	J1HH85	4/13/11	6.0		0.60	43.4		0.069	0.12	B	0.030	0.14	B	0.037	12.8		0.053	5.3	X	0.091	18.5		0.20	14.3	X	0.25
6	Duplicate of J1HH85[a]	J1HH86	4/13/11	6.7		0.64	42.1		0.074	0.13	B	0.032	0.19		0.040	15.1		0.056	5.4	X	0.097	16.2		0.21	17.3	X	0.26
7	DZ-1 re-sample 2[a]	J1HH80	4/13/11	7.0		0.65	60.9		0.074	0.13	B	0.032	0.067	B	0.040	9.8		0.057	6.2	X	0.098	14.0		0.21	18.5	X	0.26
8	DZ-2 re-sample 2[a]	J1HH81	4/13/11	2.5		0.61	57.7		0.070	0.063	B	0.031	0.046	B	0.038	6.2		0.054	6.4	X	0.093	15.3		0.20	4.2	X	0.25
9	DZ-3 re-sample 2[a]	J1HH82	4/13/11	1.9		0.64	59.7		0.074	0.042	B	0.032	0.042	B	0.040	15.1		0.057	6.6	X	0.098	13.4		0.21	2.9	X	0.26
10	DZ-4 re-sample 2[a]	J1HH83	4/13/11	4.8		0.63	68.3		0.073	0.16	B	0.032	0.081	B	0.039	12.9		0.056	6.3	X	0.096	14.4		0.21	11.4	X	0.26
11	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	9.8		0.63	35.5		0.072	0.031	U	0.031	0.039	U	0.039	7.6		0.055	5.1	X	0.095	12.8		0.21	31.3		0.26
12	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	1.8		0.59	50.3		0.068	0.030	U	0.030	0.052	B	0.037	7.2		0.052	5.5	X	0.090	15.4		0.19	8.4		0.24
13	DZ-7 re-sample 2[a]	J1HH84	4/13/11	4.2		0.69	34.7		0.079	0.098	B	0.034	0.055	B	0.043	8.8		0.060	4.7	X	0.10	11.7		0.23	11.3	X	0.28
14	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	1.1		0.62	77.1		0.072	0.031	U	0.031	0.039	U	0.039	6.5		0.055	5.5	X	0.095	12.7		0.21	3.5		0.26
15	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	2.4		0.65	57.4		0.075	0.033	U	0.033	0.041	U	0.041	8.7		0.057	5.7	X	0.099	13.6		0.21	6.0		0.27
16	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	2.8		0.67	69.0		0.077	0.074	B	0.034	0.042	U	0.042	11.6		0.059	6.4	X	0.10	15.9		0.22	8.4		0.27
17	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	3.2		0.68	90.3		0.078	0.034	U	0.034	0.064	B	0.042	8.3		0.060	6.7	X	0.10	15.8		0.22	9.8		0.28

19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg
22	DZ-8 re-sample 2[a]	J1HH85/ J1HH86	4/13/11	6.4	42.8	0.125	0.17	14.0	5.4	17.4	15.8
23	DZ-1 re-sample 2[a]	J1HH80	4/13/11	7.0	60.9	0.130	0.067	9.80	6.2	14.0	18.5
24	DZ-2 re-sample 2[a]	J1HH81	4/13/11	2.5	57.7	0.063	0.046	6.20	6.4	15.3	4.2
25	DZ-3 re-sample 2[a]	J1HH82	4/13/11	1.9	59.7	0.042	0.042	15.1	6.6	13.4	2.9
26	DZ-4 re-sample 2[a]	J1HH83	4/13/11	4.8	68.3	0.160	0.081	12.9	6.3	14.4	11.4
27	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	9.8	35.5	0.016	0.020	7.60	5.1	12.8	31.3
28	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	1.8	50.3	0.015	0.052	7.20	5.5	15.4	8.4
29	DZ-7 re-sample 2[a]	J1HH84	4/13/11	4.2	34.7	0.098	0.055	8.80	4.7	11.7	11.3
30	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	1.1	77.1	0.016	0.020	6.50	5.5	12.7	3.5
31	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	2.4	57.4	0.017	0.021	8.70	5.7	13.6	6.0
32	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	2.8	69.0	0.074	0.021	11.6	6.4	15.9	8.4
33	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	3.2	90.3	0.017	0.064	8.30	6.7	15.8	9.8

34 **Statistical Computations**

35		Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	42%	33%	0%	0%	0%	0%
39	Mean	4.0	58.6	0.064	0.054	9.72	5.9	14.4	11.0
40	Standard deviation	2.6	16.5	0.053	0.041	2.98	0.65	1.63	7.98
41	95% UCL on mean	6.3	69.8	0.089	0.089	11.6	6.2	15.3	18.7
42	Maximum value	9.8	90.3	0.160	0.19	15.1	6.7	18.5	31.3
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	20 GW & River Protection	200 GW Protection	1.51 GW & River Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection
44	**WAC 173-340 3-PART TEST**								
45	95% UCL > Cleanup Limit?	NO	NA	NA	NA	NA	NA	NA	YES
46	> 10% above Cleanup Limit?	NO	NA	NA	NA	NA	NA	NA	YES
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NA	NA	NA	NA	YES
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie

Project 100-H Field Remediation

Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11

Job No. 14655

Calc. No. 0100H-CA-V0164

Checked T. E. Queen

Rev. No. 0

Date 05/17/11

Sheet No. 13 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Deep Zone**

	Sample	Sample	Sample	Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl)phthalate			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in nitrate and nitrite		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	DZ-8 re-sample 2[a]	J1HH85	4/13/11	221		0.091	9.9	X	0.11	35.9		0.086	60.8		0.36	69	JB	47	0.9	B	2.3	2.78	J	0.52	1.70		0.21
6	Duplicate of J1HH85[a]	J1HH86	4/13/11	228		0.097	11.3	X	0.12	37.1		0.091	77.2		0.39	83	JB	47	1.2	B	2.4	2.64		0.54	1.62		0.22
7	DZ-1 re-sample 2[a]	J1HH80	4/13/11	283		0.098	10.6	X	0.12	40.3		0.092	39.0		0.39	94	JB	48	0.6	B	2.2	1.02	J	0.50	0.66		0.22
8	DZ-2 re-sample 2[a]	J1HH81	4/13/11	252		0.093	8.1	X	0.11	48.7		0.087	35.5		0.37	80	JB	47	0.7	B	2.4	55.8	JD	2.76	43.4	D	2.12
9	DZ-3 re-sample 2[a]	J1HH82	4/13/11	231		0.098	12.8	X	0.12	56.4		0.092	34.4		0.39	72	JB	45	0.9	B	2.6	26.7	JD	1.20	22.7	D	1.03
10	DZ-4 re-sample 2[a]	J1HH83	4/13/11	261		0.096	11.5	X	0.12	41.9		0.090	38.9		0.38	89	JB	45	1.7	B	2.5	2.26	J	0.56	1.40		0.22
11	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	209		0.095	10.1	X	0.12	33.6		0.089	27.4	X	0.38	48	U	48	1.0	B	2.4	7.59	J	0.54	5.36		0.22
12	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	217		0.090	9.2	X	0.11	39.4		0.084	31.6	X	0.36	47	U	47	2.6	U	2.6	5.38	J	0.59	5.67		0.23
13	DZ-7 re-sample 2[a]	J1HH84	4/13/11	206		0.10	12.2	X	0.13	30.5		0.098	29.6		0.41	78	JB	48	0.6	B	2.5	1.13	J	0.56	0.79		0.23
14	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	219		0.095	6.8	X	0.12	47.9		0.089	30.9	X	0.38	45	U	45	0.3	B	2.4	0.79	J	0.54	0.63		0.21
15	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	230		0.099	9.2	X	0.12	35.4		0.093	31.3	X	0.39	47	U	47	0.4	B	2.5	3.19	J	0.56	2.08		0.21
16	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	260		0.10	13.5	X	0.13	40.9		0.096	44.7	X	0.41	51	U	51	1.1	B	2.5	4.02		0.56	2.94		0.22
17	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	284		0.10	11.3	X	0.13	54.7		0.097	46.2	X	0.41	48	U	48	1.1	B	2.3	5.11		0.52	4.37		0.20

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19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Manganese	Nickel	Vanadium	Zinc	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in nitrate and nitrite
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	mg/kg	mg/kg	mg/kg
22	DZ-8 re-sample 2[a]	J1HH85/ J1HH86	4/13/11	225	10.6	36.5	69.0	76	1.1	2.71	1.66
23	DZ-1 re-sample 2[a]	J1HH80	4/13/11	283	10.6	40.3	39.0	94	0.6	1.02	0.66
24	DZ-2 re-sample 2[a]	J1HH81	4/13/11	252	8.10	48.7	35.5	80	0.7	55.8	43.4
25	DZ-3 re-sample 2[a]	J1HH82	4/13/11	231	12.8	56.4	34.4	72	0.9	26.7	22.7
26	DZ-4 re-sample 2[a]	J1HH83	4/13/11	261	11.5	41.9	38.9	89	1.7	2.26	1.40
27	DZ-5 re-sample 1[a]	J1FKK5	3/16/11	209	10.1	33.6	27.4	24	1.0	7.59	5.36
28	DZ-6 re-sample 1[a]	J1FKK6	3/16/11	217	9.20	39.4	31.6	24	1.3	5.38	5.67
29	DZ-7 re-sample 2[a]	J1HH84	4/13/11	206	12.2	30.5	29.6	78	0.6	1.13	0.79
30	DZ-9 re-sample 1[a]	J1FKK9	3/16/11	219	6.80	47.9	30.9	23	0.3	0.79	0.63
31	DZ-10 re-sample 1[a]	J1FKL0	3/16/11	230	9.20	35.4	31.3	24	0.4	3.19	2.08
32	DZ-11 re-sample 1[a]	J1FKL1	3/16/11	260	13.5	40.9	44.7	26	1.1	4.02	2.94
33	DZ-12 re-sample 1[a]	J1FKL2	3/16/11	284	11.3	54.7	46.2	24	1.1	5.11	4.37

34 **Statistical Computations**

35		Manganese	Nickel	Vanadium	Zinc	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in Nitrate [b]	Nitrogen in nitrate and nitrite
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	0%	50%	8%	0%	0%
39	Mean	240	10.5	42.2	38.2	53	0.9	9.64	7.64
40	Standard deviation	27	1.95	8.2	11.3	31	0.4	16.1	12.8
41	95% UCL on mean	255	11.7	47.0	43.6	67	1.3	34.0	31.3
42	Maximum value	284	13.5	56.4	77.2	94	1.7	55.8	43.4
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	512 GW & River Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	360 ug/kg River Protection	96.0 GW Protection	1000 GW Protection	1000 GW Protection
44	**WAC 173-340 3-PART TEST**								
45	95% UCL > Cleanup Limit?	NA	NA	NA	NO	NO	NA	NO	NO
46	> 10% above Cleanup Limit?	NA	NA	NA	NO	NO	NA	NO	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	NO	NO	NA	NO	NO
48	**WAC 173-340 Compliance?**	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator: J. D. Skoglie   Date: 05/17/11   Calc. No.: 0100H-CA-V0164   Rev. No.: 0
Project: 100-H Field Remediation   Job No.: 14655   Checked: T. E. Queen   Date: 05/17/11
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations   Sheet No.: 14 of 47

116-H-5 Statistical Calculations

Verification Data -Deep Zone

Sample Area	Sample Number	Sample Date	Sulfate mg/kg	Q	PQL	TPH-motor oil (high boiling) ug/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	7.8		2.3	5670	J	10200
Duplicate of J1HH85[a]	J1HH86	4/13/11	8.4		2.4	3480	J	10400
DZ-1 re-sample 2[a]	J1HH80	4/13/11	4.9		2.2	10400	UJ	10400
DZ-2 re-sample 2[a]	J1HH81	4/13/11	160	JD	12.2	10600	UJ	10600
DZ-3 re-sample 2[a]	J1HH82	4/13/11	101		2.6	10300	UJ	10300
DZ-4 re-sample 2[a]	J1HH83	4/13/11	8.1		2.5	9290	J	10400
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	17.6		2.4	10500	UJ	10500
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	19.2		2.6	127000	J	10500
DZ-7 re-sample 2[a]	J1HH84	4/13/11	10.3		2.5	4230	J	10300
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	5.8		2.4	18700	J	10400
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	11.3		2.5	6750	J	10400
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	18.6		2.5	6760	J	10500
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	25.3		2.3	8670	J	10100

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Sulfate mg/kg	TPH-motor oil (high boiling) ug/kg
DZ-8 re-sample 2[a]	J1HH85/ J1HH86	4/13/11	8.1	4575
DZ-1 re-sample 2[a]	J1HH80	4/13/11	4.9	5200
DZ-2 re-sample 2[a]	J1HH81	4/13/11	160	5300
DZ-3 re-sample 2[a]	J1HH82	4/13/11	101	5150
DZ-4 re-sample 2[a]	J1HH83	4/13/11	8.1	9290
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	17.6	5250
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	19.2	127000
DZ-7 re-sample 2[a]	J1HH84	4/13/11	10.3	4230
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	5.8	18700
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	11.3	6750
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	18.6	6760
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	25.3	8670

Statistical Computations

	Sulfate	TPH-motor oil (high boiling)
95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
N	12	12
% < Detection limit	0%	33%
Mean	32.5	17240
Standard deviation	47.9	34789
95% UCL on mean	55.2	33760
Maximum value	160	127000
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	25000 GW Protection	200000 ug/kg GW & River Protection
WAC 173-340 3-PART TEST		
95% UCL > Cleanup Limit?	NA	NO
> 10% above Cleanup Limit?	NA	NO
Any sample > 2X Cleanup Limit?	NA	NO
WAC 173-340 Compliance?	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 15 of 47

116-H-5 Maximum Calculations

Verification Data -Deep Zone

Sample Area	Sample Number	Sample Date	Boron			Mercury			Molybdenum			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	0.90	U	0.90	0.019		0.0050	0.24	U	0.24	3.0	U	3.0	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
Duplicate of J1HH85[a]	J1HH86	4/13/11	0.95	U	0.95	0.020		0.0050	0.25	U	0.25	3.1	U	3.1	3.2	U	3.2	6.5	U	6.5	4.3	U	4.3
DZ-1 re-sample 2[a]	J1HH80	4/13/11	1.2	B	0.96	0.0055	U	0.0055	0.25	U	0.25	5.1	J	3.3	32		3.4	27		6.9	27		4.5
DZ-2 re-sample 2[a]	J1HH81	4/13/11	0.91	U	0.91	0.0051	U	0.0051	0.24	U	0.24	3.1	U	3.1	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
DZ-3 re-sample 2[a]	J1HH82	4/13/11	0.96	U	0.96	0.0053	U	0.0053	0.25	U	0.25	3.0	U	3.0	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1
DZ-4 re-sample 2[a]	J1HH83	4/13/11	0.94	U	0.94	0.0057	U	0.0057	0.87	B	0.25	3.1	U	3.1	54		3.2	41		6.4	51		4.2
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	0.93	U	0.93	0.0056	U	0.0056	0.25	U	0.25	3.2	U	3.2	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	0.88	U	0.88	0.0057	U	0.0057	0.23	U	0.23	3.1	U	3.1	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3
DZ-7 re-sample 2[a]	J1HH84	4/13/11	1.0	U	1.0	0.0063	U	0.0063	0.27	U	0.27	3.4	U	3.4	3.6	U	3.6	11	J	7.2	8.2	J	4.7
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	0.93	U	0.93	0.0055	U	0.0055	0.25	U	0.25	3.0	U	3.0	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	0.97	U	0.97	0.0054	U	0.0054	0.26	U	0.26	3.1	U	3.1	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	1.0	U	1.0	0.0060	U	0.0060	0.26	U	0.26	3.3	U	3.3	3.5	U	3.5	7.0	U	7.0	4.6	U	4.6
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	1.0	U	1.0	0.0052	U	0.0052	0.27	U	0.27	3.1	U	3.1	3.2	U	3.2	6.5	U	6.5	4.2	U	4.2

Statistical Computations

	Boron	Mercury	Molybdenum	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
% < Detection limit	92%	92%	92%	92%	83%	75%	75%
Maximum value	1.2	0.020	0.87	5.1	54	41	51
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	320 GW Protection	0.33 GW & River Protection	8 GW Protection	240000 ug/kg GW Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection
3-PART TEST							
Maximum > Cleanup Limit?	NO	NA	NO	NO	YES	YES	YES
> 10% above Cleanup Limit?	NO	NA	NO	NO	YES	YES	YES
Any sample > 2X Cleanup Limit?	NO	NA	NO	NO	YES	YES	YES
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed.	A detailed assessment will be performed.	A detailed assessment will be performed.

116-H-5 Maximum Calculations

Verification Data -Deep Zone

Sample Area	Sample Number	Sample Date	Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Fluoranthene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	7.1	U	7.1	3.9	U	3.9	4.8	U	4.8	13	U	13	12	U	12	12	U	12	12	U	12
Duplicate of J1HH85[a]	J1HH86	4/13/11	7.3	U	7.3	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12
DZ-1 re-sample 2[a]	J1HH80	4/13/11	16	J	7.7	13	J	4.2	26	J	5.2	43		14	19	J	13	18	J	13	48		13
DZ-2 re-sample 2[a]	J1HH81	4/13/11	7.2	U	7.2	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12
DZ-3 re-sample 2[a]	J1HH82	4/13/11	7.1	U	7.1	3.9	U	3.9	4.8	U	4.8	13	U	13	12	U	12	12	U	12	12	U	12
DZ-4 re-sample 2[a]	J1HH83	4/13/11	32		7.2	30		4.0	45		4.9	69		13	35		12	17	J	12	77		12
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	7.4	U	7.4	4.1	U	4.1	5.0	U	5.0	13	U	13	12	U	12	12	U	12	12	U	12
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	7.4	U	7.4	4.1	U	4.1	5.0	U	5.0	13	U	13	12	U	12	12	U	12	12	U	12
DZ-7 re-sample 2[a]	J1HH84	4/13/11	8.1	U	8.1	5.8	J	4.4	8.6	J	5.4	15	U	15	13	U	13	13	U	13	15	J	13
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	7.2	U	7.2	3.9	U	3.9	4.8	U	4.8	13	U	13	12	U	12	12	U	12	12	U	12
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	7.2	U	7.2	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	7.8	U	7.8	4.3	U	4.3	5.3	U	5.3	14	U	14	13	U	13	13	U	13	13	U	13
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	7.3	U	7.3	4.0	U	4.0	4.9	U	4.9	13	U	13	12	U	12	12	U	12	12	U	12

Statistical Computations

	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
% < Detection limit	83%	75%	75%	83%	83%	83%	75%
Maximum value	32	30	45	69	35	18	77
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	48000 ug/kg GW & River Protection	15 ug/kg GW & River Protection	100 ug/kg GW & River Protection	18000 ug/kg River Protection	330 ug/kg GW & River Protection	240000 ug/kg GW Protection	48000 ug/kg GW Protection
3-PART TEST							
Maximum > Cleanup Limit?	NO	YES	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	A detailed assessment will be performed.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 16 of 47

116-H-5 Maximum Calculations

Verification Data -Deep Zone

Sample Area	Sample Number	Sample Date	Aroclor-1260			4,4'-DDD			4,4'-DDT			Chloride			Nitrogen in nitrite [b]		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-1	J19YD1	5/18/10	13.7	U	13.7	1.37	UD	1.37	1.37	UD	1.37	2.3	U	2.3	0.70	UR	0.70
Duplicate of J19YD1	J19YF3	5/18/10	13.8	U	13.8	1.39	UD	1.39	1.39	UD	1.39	2.4	U	2.4	0.73	U	0.73
DZ-2	J19YD2	5/18/10	13.1	U	13.1	1.31	UD	1.31	1.31	UD	1.31	2.2	U	2.2	0.67	UR	0.67
DZ-3	J19YD3	5/18/10	7.31	J	13.9	2.12	JD	1.39	3.1	JD	1.39	17.6		2.4	0.40	JB	0.73
DZ-4	J19YD4	5/18/10	13.8	U	13.8	1.39	UD	1.39	1.39	UD	1.39	5.1		2.6	0.79	UR	0.79
DZ-5	J19YD5	5/18/10	13.3	U	13.3	1.33	UD	1.33	1.33	UD	1.33	2.5	U	2.5	0.76	UR	0.76
DZ-6	J19YD6	5/18/10	13.9	U	13.9	1.4	UD	1.4	1.4	UD	1.4	2.4	U	2.4	0.73	UR	0.73
DZ-7	J19YD7	5/18/10	6.28	J	13.8	1.38	UD	1.38	1.38	UD	1.38	2.6	U	2.6	0.79	UR	0.79
DZ-8	J19YD8	5/18/10	14	U	14	1.4	UD	1.4	1.4	UD	1.4	2.5	U	2.5	0.76	UR	0.76
DZ-9	J19YD9	5/18/10	13.4	U	13.4	1.34	UD	1.34	1.34	UD	1.34	2.4	U	2.4	0.73	UR	0.73
DZ-10	J19YF0	5/18/10	13.8	UJ	13.8	1.39	UD	1.39	1.39	UD	1.39	2.5	U	2.5	0.76	UR	0.76
DZ-11	J19YF1	5/18/10	14.1	U	14.1	1.41	UD	1.41	1.41	UD	1.41	2.5	U	2.5	0.76	U	0.76
DZ-12	J19YF2	5/18/10	13.7	U	13.7	1.37	UD	1.37	1.37	UD	1.37	2.9		2.3	0.70	U	0.70

Statistical Computations

	Aroclor-1260		4,4'-DDD		4,4'-DDT		Chloride		Nitrogen in nitrite [b]	
% < Detection limit	83%		92%		92%		75%		92%	
Maximum value	7.31		2.12		3.10		17.6		0.40	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	17 ug/kg	GW & River Protection	3.3 ug/kg	River Protection	3.3 ug/kg	River Protection	25000	GW Protection	100	GW Protection
3-PART TEST										
Maximum > Cleanup Limit?	NO		NO		NO		NA		NO	
> 10% above Cleanup Limit?	NO		NO		NO		NA		NO	
Any sample > 2X Cleanup Limit?	NO		NO		NO		NA		NO	
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (100 mg/kg) the 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

CALCULATION SHEET

Washington Closure Hanford

Originator: J. D. Skoglie
Project: 100-H Field Remediation
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date: 05/17/11
Job No.: 14655

Calc. No.: 0100H-CA-V0164
Checked: T. E. Queen

Rev. No.: 0
Date: 05/17/11
Sheet No.: 17 of 47

116-H-5 Statistical Calculations

Verification Data -Overburden

Sample Area	Sample Number	Sample Date	Carbon-14			Plutonium-238			Tritium			Uranium-233/234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.663	U	0.866	0	U	0.269	1.61	U	2.42	0.517		0.172	0.427		0.172
Duplicate of J19YF8	J19YH6	5/13/10	0.910	U	0.933	0.030	U	0.230	1.88	U	2.60	0.579		0.201	0.526		0.201
OB-1	J19YF4	5/13/10	0.576	U	0.674	0.024	U	0.227	0.746	U	2.51	0.541		0.138	0.559		0.138
OB-2	J19YF5	5/13/10	0.872	U	0.968	0.267		0.227	2.93		2.68	0.494		0.169	0.459		0.135
OB-3	J19YF6	5/13/10	0.145	U	0.982	0	U	0.267	3.04		2.74	0.401		0.161	0.527		0.161
OB-4	J19YF7	5/13/10	1.54		0.920	0	U	0.332	3.61		2.67	0.598		0.148	0.444		0.148
OB-6	J19YF9	5/13/10	1.24		0.890	0	U	0.322	0.975	U	2.50	0.620		0.250	0.588		0.250
OB-7	J19YH0	5/13/10	1.24		0.917	0.0230	U	0.224	2.78		2.59	0.558		0.194	0.660		0.194
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0	U	0.451	0.0395	U	0.148	0.00188	U	0.0264	0.138	U	0.177	0.186	U	0.191
OB-9	J19YH2	5/13/10	1.49		0.882	1.46		0.298	2.22	U	2.44	0.482		0.194	0.508		0.194
OB-10	J19YH3	5/13/10	1.02		0.904	0	U	0.180	2.61		2.56	0.632		0.186	0.292		0.186
OB-11	J19YH4	5/13/10	0.261	U	0.882	0	U	0.170	0.916	U	2.47	0.464		0.209	0.628		0.209
OB-12	J19YH5	5/13/10	0.430	U	0.943	0	U	0.185	0.680	U	2.62	0.760		0.224	0.731		0.224
OB-13	J1B4H9	5/17/10	0.051	U	0.513	0.037	U	0.282	0	U	7.04	0.495		0.223	0.524		0.223
OB-14	J1B4J0	5/17/10	0.063	U	0.511	0	U	0.262	0	U	7.68	0.778		0.161	0.421		0.161
OB-15	J1B4J1	5/17/10	0	U	0.526	0	U	0.242	0	U	7.28	0	U	0.046	0.013	U	0.032

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Plutonium-238 pCi/g	Tritium pCi/g	Uranium-233/234 pCi/g	Uranium-238 pCi/g
OB-5	J19YF8/ J19YH6	5/13/10	0.787	0.015	1.75	0.548	0.477
OB-1	J19YF4	5/13/10	0.576	0.024	0.746	0.541	0.559
OB-2	J19YF5	5/13/10	0.872	0.267	0	0.494	0.459
OB-3	J19YF6	5/13/10	0.145	0	3.04	0.401	0.527
OB-4	J19YF7	5/13/10	1.54	0	3.61	0.598	0.444
OB-6	J19YF9	5/13/10	1.24	0	0.975	0.620	0.588
OB-7	J19YH0	5/13/10	1.24	0.023	2.78	0.558	0.660
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0	0.040	0.00188	0.138	0.186
OB-9	J19YH2	5/13/10	1.49	1.46	2.22	0.482	0.508
OB-10	J19YH3	5/13/10	1.02	0	2.61	0.632	0.292
OB-11	J19YH4	5/13/10	0.261	0	0.92	0.464	0.628
OB-12	J19YH5	5/13/10	0.430	0	0.680	0.760	0.731
OB-13	J1B4H9	5/17/10	0.0510	0.037	0	0.495	0.524
OB-14	J1B4J0	5/17/10	0.0630	0	0	0.778	0.421
OB-15	J1B4J1	5/17/10	0	0	0	0	0.0130

Statistical Computations

	Carbon-14	Plutonium-238	Tritium	Uranium-233/234	Uranium-238
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
N	15	15	15	15	15
% < Detection limit	67%	87%	67%	13%	13%
Mean	0.628	0.108	0.0290	1.07	0.468
Standard deviation	0.561	0.376	1.27	0.205	0.186
Z-statistic	1.64	1.64	1.64	1.64	1.64
95% UCL on mean	0.866	0.268	0.570	1.16	0.547
Maximum value	1.54	0.267	3.61	0.778	0.731

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0		
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11		
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 18 of 47		

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Overburden**

Row	Sample Area	Sample Number	Sample Date	Antimony mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	0.344	B	0.813	4.95		0.813	51.4		0.407	0.162	B	0.163	0.938	B	1.63	0.203	U	0.203	10.4		0.813	5.41		2.44
6	Duplicate of J19YF8	J19YH6	5/13/10	0.388	B	0.951	4.74		0.951	47.2		0.478	0.149	B	0.190	0.842	B	1.90	0.238	U	0.238	10.1		0.951	5.16		2.85
7	OB-1	J19YF4	5/13/10	0.377	B	0.722	3.27		0.722	50.9		0.361	0.153		0.144	0.853	B	1.44	0.180	U	0.180	13.2		0.722	5.37		2.17
8	OB-2	J19YF5	5/13/10	0.437	B	0.912	4.17		0.912	51.8		0.456	0.161	B	0.182	0.958	B	1.82	0.054	B	0.228	11.4		0.912	5.34		2.74
9	OB-3	J19YF6	5/13/10	0.464	B	0.854	6.21		0.854	47.8		0.427	0.169	B	0.171	0.916	B	1.71	0.213	U	0.213	10.7		0.854	5.52		2.56
10	OB-4	J19YF7	5/13/10	0.272	B	0.840	3.96		0.840	48.5		0.420	0.162	B	0.168	0.902	B	1.68	0.210	U	0.210	11.7		0.840	5.15		2.52
11	OB-6	J19YF9	5/13/10	0.426	B	0.869	8.14		0.869	54.4		0.434	0.197		0.174	1.17	B	1.74	0.070	B	0.217	11.7		0.869	5.80		2.61
12	OB-7	J19YH0	5/13/10	0.279	B	0.855	5.13		0.855	43.1		0.427	0.149	B	0.171	0.805	B	1.71	0.084	B	0.214	9.84		0.855	4.93		2.56
13	OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.370	U	0.370	6.50		0.630	49.8	X	0.073	0.120	B	0.032	1.30	B	0.94	0.064	B	0.039	10.6	X	0.056	6.10	X	0.096
14	OB-9	J19YH2	5/13/10	0.773	U	0.773	3.59		0.773	48.7		0.386	0.136	B	0.155	0.752	B	1.55	0.193	U	0.193	9.58		0.773	4.95		2.32
15	OB-10	J19YH3	5/13/10	0.309	B	0.933	4.77		0.933	37.8		0.466	0.140	B	0.187	0.843	B	1.87	0.233	U	0.233	9.93		0.933	5.27		2.80
16	OB-11	J19YH4	5/13/10	0.491	B	0.854	6.82		0.854	67.6		0.427	0.208		0.171	1.34	B	1.71	0.064	B	0.214	12.8		0.854	5.88		2.56
17	OB-12	J19YH5	5/13/10	0.469	B	0.776	5.29		0.776	46.4		0.388	0.175		0.155	1.15	B	1.55	0.039	B	0.194	11.7		0.776	5.39		2.33
18	OB-13	J1B4H9	5/17/10	0.254	B	0.652	4.23		0.652	57.1		0.326	0.181		0.130	2.55		1.30	0.068	B	0.163	10.3		0.652	5.36		1.96
19	OB-14	J1B4J0	5/17/10	0.772	U	0.772	4.75		0.772	46.2		0.386	0.147	B	0.154	1.70		1.54	0.042	B	0.193	11.0		0.772	4.92		2.32
20	OB-15	J1B4J1	5/17/10	0.274	B	0.881	6.10		0.881	57.4		0.441	0.181		0.176	2.02		1.76	0.057	B	0.220	11.1		0.881	5.90		2.64

22 **Statistical Computation Input Data**

Row	Sample Area	Sample Number	Sample Date	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg
25	OB-5	J19YF8/ J19YH6	5/13/10	0.366	4.85	49.3	0.156	0.890	0.110	10.3	5.29
26	OB-1	J19YF4	5/13/10	0.377	3.27	50.9	0.153	0.853	0.090	13.2	5.37
27	OB-2	J19YF5	5/13/10	0.437	4.17	51.8	0.161	0.958	0.054	11.4	5.34
28	OB-3	J19YF6	5/13/10	0.464	6.21	47.8	0.169	0.916	0.107	10.7	5.52
29	OB-4	J19YF7	5/13/10	0.272	3.96	48.5	0.162	0.902	0.105	11.7	5.15
30	OB-6	J19YF9	5/13/10	0.426	8.14	54.4	0.197	1.17	0.070	11.7	5.80
31	OB-7	J19YH0	5/13/10	0.279	5.13	43.1	0.149	0.805	0.084	9.84	4.93
32	OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.185	6.50	49.8	0.120	1.30	0.064	10.6	6.10
33	OB-9	J19YH2	5/13/10	0.387	3.59	48.7	0.136	0.752	0.097	9.58	4.95
34	OB-10	J19YH3	5/13/10	0.309	4.77	37.8	0.140	0.843	0.117	9.93	5.27
35	OB-11	J19YH4	5/13/10	0.491	6.82	67.6	0.208	1.34	0.064	12.8	5.88
36	OB-12	J19YH5	5/13/10	0.469	5.29	46.4	0.175	1.15	0.039	11.7	5.39
37	OB-13	J1B4H9	5/17/10	0.254	4.23	57.1	0.181	2.55	0.068	10.3	5.36
38	OB-14	J1B4J0	5/17/10	0.386	4.75	46.2	0.147	1.70	0.042	11.0	4.92
39	OB-15	J1B4J1	5/17/10	0.274	6.10	57.4	0.181	2.02	0.057	11.1	5.90

40 **Statistical Computations**

Row		Antimony		Arsenic		Barium		Beryllium		Boron		Cadmium		Chromium		Cobalt	
42	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
43	N	15		15		15		15		15		15		15		15	
44	% < Detection limit	20%		0%		0%		0%		0%		40%		0%		0%	
45	Mean	0.358		5.19		50.5		0.162		1.21		0.078		11.1		5.41	
46	Standard deviation	0.092		1.34		6.9		0.023		0.51		0.025		1.05		0.37	
47	95% UCL on mean	0.414		5.89		53.8		0.174		1.43		0.094		11.5		5.58	
48	Maximum value	0.491		8.14		67.6		0.208		2.55		0.070		13.2		5.90	
49	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	5	GW & River Protection	20	DE, GW & River Protection	200	GW Protection	1.51	GW & River Protection	320	GW Protection	0.81	GW & River Protection	18.5	GW & River Protection	15.7	GW Protection
50	WAC 173-340 3-PART TEST																
51	95% UCL > Cleanup Limit?	NA		NO		NA		NA		NO		NA		NA		NA	
52	> 10% above Cleanup Limit?	NA		NO		NA		NA		NO		NA		NA		NA	
53	Any sample > 2X Cleanup Limit?	NA		NO		NA		NA		NO		NA		NA		NA	
54	WAC 173-340 Compliance?	Because all values are below background (5 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	

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CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 19 of 47

116-H-5 Statistical Calculations

Verification Data -Overburden

Sample Area	Sample Number	Sample Date	Copper mg/kg	Q	PQL	Hexavalent chromium mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL	Molybdenum mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	12.7		1.63	0.20	U	0.20	13.1		0.813	250		0.813	0.200	B	0.813	11.1		2.03	42.5		0.813	32.2		2.44
Duplicate of J19YF8	J19YH6	5/13/10	12.7		1.90	0.16	B	0.20	13.0		0.951	239		0.951	0.951	U	0.951	10.6		2.38	39.5		0.951	31.2		2.85
OB-1	J19YF4	5/13/10	13.5		1.44	0.15	B	0.20	6.95		0.722	266		0.722	0.250	B	0.722	10.9		1.80	41.7		0.722	32.8		2.17
OB-2	J19YF5	5/13/10	14.3		1.82	0.11	B	0.20	10.3		0.912	259		0.912	0.352	B	0.912	11.0		2.28	46.4		0.912	41.2		2.74
OB-3	J19YF6	5/13/10	13.5		1.71	0.18	B	0.20	17.6		0.854	251		0.854	0.232	B	0.854	10.1		2.13	45.3		0.854	33.3		2.56
OB-4	J19YF7	5/13/10	13.8		1.68	0.15	B	0.20	7.44		0.840	256		0.840	0.276	B	0.840	10.5		2.10	43.6		0.840	33.2		2.52
OB-6	J19YF9	5/13/10	13.2		1.74	0.14	B	0.20	25.2		0.869	272		0.869	0.313	B	0.869	9.82		2.17	46.5		0.869	39.0		2.61
OB-7	J19YH0	5/13/10	13.4		1.71	0.20	B	0.20	16.8		0.855	220		0.855	0.227	B	0.855	9.49		2.14	38.8		0.855	55.3		2.56
OB-8 re-sample 1[a]	J1FKL6	3/17/11	13.6		0.21	0.184		0.154	17.9	X	0.26	253	X	0.096	0.250	U	0.250	10.3	X	0.12	42.1		0.090	34.3	X	0.38
OB-9	J19YH2	5/13/10	11.7		1.55	0.12	B	0.20	8.91		0.773	224		0.773	0.167	B	0.773	8.89		1.93	41.5		0.773	30.1		2.32
OB-10	J19YH3	5/13/10	12.4		1.87	0.17	B	0.20	11.3		0.933	244		0.933	0.933	U	0.933	9.11		2.33	39.4		0.933	29.4		2.80
OB-11	J19YH4	5/13/10	14.5		1.71	0.15	B	0.20	22.4		0.854	276		0.854	0.199	B	0.854	11.6		2.14	45.5		0.854	44.4		2.56
OB-12	J19YH5	5/13/10	13.4		1.55	0.11	B	0.20	14.0		0.776	248		0.776	0.209	B	0.776	11.9		1.94	44.8		0.776	33.1		2.33
OB-13	J1B4H9	5/17/10	12.9		1.30	0.20	U	0.20	10.5		0.652	250		0.652	0.272	B	0.652	9.50		1.63	45.1		0.652	59.6		1.96
OB-14	J1B4J0	5/17/10	12.2		1.54	0.20	U	0.20	12.3		0.772	227		0.772	0.308	B	0.772	9.29		1.93	42.1		0.772	37.0		2.32
OB-15	J1B4J1	5/17/10	13.6		1.76	0.20	U	0.20	14.3		0.881	262		0.881	0.289	B	0.881	11.8		2.2	44.9		0.881	49.4		2.64

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Copper mg/kg	Hexavalent chromium mg/kg	Lead mg/kg	Manganese mg/kg	Molybdenum mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg
OB-5	J19YF8/ J19YH6	5/13/10	12.7	0.13	13.1	245	0.338	10.9	41.0	31.7
OB-1	J19YF4	5/13/10	13.5	0.15	7.0	266	0.250	10.9	41.7	32.8
OB-2	J19YF5	5/13/10	14.3	0.11	10.3	259	0.352	11.0	46.4	41.2
OB-3	J19YF6	5/13/10	13.5	0.18	17.6	251	0.232	10.1	45.3	33.3
OB-4	J19YF7	5/13/10	13.8	0.15	7.44	256	0.276	10.5	43.6	33.2
OB-6	J19YF9	5/13/10	13.2	0.14	25.2	272	0.313	9.82	46.5	39.0
OB-7	J19YH0	5/13/10	13.4	0.20	16.8	220	0.227	9.49	38.8	55.3
OB-8 re-sample 1[a]	J1FKL6	3/17/11	13.6	0.18	17.9	253	0.125	10.3	42.1	34.3
OB-9	J19YH2	5/13/10	11.7	0.12	8.91	224	0.167	8.89	41.5	30.1
OB-10	J19YH3	5/13/10	12.4	0.17	11.3	244	0.467	9.11	39.4	29.4
OB-11	J19YH4	5/13/10	14.5	0.15	22.4	276	0.199	11.6	45.5	44.4
OB-12	J19YH5	5/13/10	13.4	0.11	14.0	248	0.209	11.9	44.8	33.1
OB-13	J1B4H9	5/17/10	12.9	0.10	10.5	250	0.272	9.50	45.1	59.6
OB-14	J1B4J0	5/17/10	12.2	0.10	12.3	227	0.308	9.29	42.1	37.0
OB-15	J1B4J1	5/17/10	13.6	0.10	14.3	262	0.289	11.8	44.9	49.4

Statistical Computations

	Copper		Hexavalent chromium		Lead		Manganese		Molybdenum		Nickel		Vanadium		Zinc	
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
N	15		15		15		15		15		15		15		15	
% < Detection limit	0%		20%		0%		0%		13%		0%		0%		0%	
Mean	13.2		0.14		13.9		250		0.268		10.3		43.2		38.9	
Standard deviation	0.8		0.033		5.3		16.6		0.084		0.99		2.48		9.34	
95% UCL on mean	13.6		0.16		17.0		258		0.318		10.8		44.4		43.4	
Maximum value	14.5		0.20		25.2		276		0.313		11.9		46.5		59.6	
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	22.0	River Protection	2	River Protection	10.2	GW & River Protection	512	GW & River Protection	8	GW Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection
WAC 173-340 3-PART TEST																
95% UCL > Cleanup Limit?	NA		NO		YES		NA		NO		NA		NA		NA	
> 10% above Cleanup Limit?	NA		NO		YES		NA		NO		NA		NA		NA	
Any sample > 2X Cleanup Limit?	NA		NO		YES		NA		NO		NA		NA		NA	
WAC 173-340 Compliance?	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie	Date 05/17/11	Calc. No. 0100H-CA-V0164	Rev. No. 0
Project 100-H Field Remediation	Job No. 14655	Checked T. E. Queen	Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 20 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Overburden**

3	Sample	Sample	Sample	Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene			Chrysene			Dibenz[a,h]anthracene			Fluoranthene		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	5.88		3.25	7.38		3.25	8.77		3.25	4.89		3.25	3.72		3.25	3.77		3.25	0.894	J	3.25	21		3.25
6	Duplicate of J19YF8	J19YH6	5/13/10	4.07		3.25	4.25		, 3.25	7.52		3.25	3.03	J	3.25	2.31	J	3.25	1.17	J	3.25	3.25	U	3.25	9.18		3.25
7	OB-1	J19YF4	5/13/10	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	3.98		3.35
8	OB-2	J19YF5	5/13/10	3.26	U	3.26	1.24	J	3.26	3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	3.26	U	3.26	1.39	J	3.26
9	OB-3	J19YF6	5/13/10	0.974	J	3.35	1.7	J	3.35	1.44	J	3.35	1.56	J	3.35	3.35	U	3.35	3.35	U	3.35	3.35	U	3.35	6.45		3.35
10	OB-4	J19YF7	5/13/10	0.919	J	3.28	1.44	J	3.28	1.07	J	3.28	0.837	J	3.28	3.28	U	3.28	1.46	J	3.28	3.28	U	3.28	6.55		3.28
11	OB-6	J19YF9	5/13/10	4.65		3.24	7.63		3.24	9.71		3.24	9.53		3.24	3.92		3.24	5.51		3.24	1.43	J	3.24	15.3		3.24
12	OB-7	J19YH0	5/13/10	55.5		3.34	68.8		3.34	71.0		3.34	36.8		3.34	30.4		3.34	39.9		3.34	8.73		3.34	161		3.34
13	OB-8 re-sample 1[a]	J1FKL6	3/17/11	18		3.3	17		6.6	18		4.3	7.4	U	7.4	9.20	J	4.1	16.0	J	5.0	11	U	11	13.0	U	13.0
14	OB-9	J19YH2	5/13/10	94.5		3.25	85.3		3.25	84.1		3.25	64.5		3.25	43.5		3.25	160		3.25	19.0		3.25	269		3.25
15	OB-10	J19YH3	5/13/10	13.3		3.32	11.9		3.32	11.7		3.32	9.20		3.32	6.08		3.32	34.1		3.32	2.49	J	3.32	29.1		3.32
16	OB-11	J19YH4	5/13/10	21.3		3.18	57.4		3.18	53.5		3.18	98.0		3.18	22.1		3.18	17.3		3.18	10.8		3.18	54.6		3.18
17	OB-12	J19YH5	5/13/10	13.7		3.36	12.8		3.36	17		3.36	9.28		3.36	6.11		3.36	23.7		3.36	1.6	J	3.36	29.5		3.36
18	OB-13	J1B4H9	5/17/10	10.2		3.33	7.41		3.33	15.4		3.33	4.4		3.33	3.40		3.33	18.7		3.33	3.33	U	3.33	24.6		3.33
19	OB-14	J1B4J0	5/17/10	6.98		3.33	5.72		3.33	8.78		3.33	4.07		3.33	2.53	J	3.33	8.23		3.33	3.33	U	3.33	17.9		3.33
20	OB-15	J1B4J1	5/17/10	22.3		3.34	18.9		3.34	27.5		3.34	11.6		3.34	7.86		3.34	32.5		3.34	1.49	J	3.34	65.9		3.34

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22 **Statistical Computation Input Data**

23	Sample	Sample	Sample	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene
24	Area	Number	Date	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
25	OB-5	J19YF8/ J19YH6	5/13/10	5.0	5.82	8.15	3.96	3.02	2.47	1.26	15.1
26	OB-1	J19YF4	5/13/10	1.7	1.68	1.68	1.68	1.68	1.68	1.7	3.98
27	OB-2	J19YF5	5/13/10	1.6	1.24	1.63	1.63	1.63	1.63	1.6	1.39
28	OB-3	J19YF6	5/13/10	1.0	1.70	1.44	1.56	1.68	1.68	1.7	6.45
29	OB-4	J19YF7	5/13/10	0.9	1.44	1.07	0.84	1.64	1.46	1.6	6.55
30	OB-6	J19YF9	5/13/10	4.7	7.63	9.71	9.53	3.92	5.51	1.4	15.3
31	OB-7	J19YH0	5/13/10	55.5	68.8	71.0	36.8	30.4	39.9	8.7	161
32	OB-8 re-sample 1[a]	J1FKL6	3/17/11	18.0	17.0	18.0	3.70	9.20	16.0	5.5	6.50
33	OB-9	J19YH2	5/13/10	94.5	85.3	84.1	64.5	43.5	160.0	19.0	269
34	OB-10	J19YH3	5/13/10	13.3	11.9	11.7	9.20	6.08	34.1	2.5	29.1
35	OB-11	J19YH4	5/13/10	21.3	57.4	53.5	98.0	22.1	17.3	10.8	54.6
36	OB-12	J19YH5	5/13/10	13.7	12.8	17.0	9.28	6.11	23.7	1.6	29.5
37	OB-13	J1B4H9	5/17/10	10.2	7.41	15.4	4.40	3.40	18.7	1.7	24.6
38	OB-14	J1B4J0	5/17/10	7.0	5.72	8.78	4.07	2.53	8.23	1.7	17.9
39	OB-15	J1B4J1	5/17/10	22.3	18.9	27.5	11.6	7.86	32.5	1.5	65.9

40 **Statistical Computations**

41		Benzo(a)anthracene		Benzo(a)pyrene		Benzo(b)fluoranthene		Benzo(ghi)perylene		Benzo(k)fluoranthene		Chrysene		Dibenz[a,h]anthracene		Fluoranthene	
42	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
43	N	15		15		15		15		15		15		15		15	
44	% < Detection limit	13%		7%		13%		20%		27%		20%		47%		7%	
45	Mean	18.0		20.3		22.0		17.4		9.6		24.3		4.15		47.1	
46	Standard deviation	25.3		27.1		26.3		28.1		12.5		39.7		5.05		73.5	
47	95% UCL on mean	78.5		83.1		105		62.9		21.9		113		6.29		188	
48	Maximum value	94.5		85.3		84.1		98.0		43.5		160		19.0		269	
49	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	15 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	48000 ug/kg	GW & River Protection	15 ug/kg	GW & River Protection	100 ug/kg	GW & River Protection	30 ug/kg	GW & River Protection	18000 ug/kg	River Protection
50	**WAC 173-340 3-PART TEST**																
51	95% UCL > Cleanup Limit?	YES		YES		YES		NO		YES		YES		NO		NO	
52	> 10% above Cleanup Limit?	YES		YES		YES		NO		YES		NO		NO		NO	
53	Any sample > 2X Cleanup Limit?	YES		YES		YES		NO		YES		NO		NO		NO	
54	**WAC 173-340 Compliance?**	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.		The data set meets the 3-part test criteria when compared to the most stringent RAG.	

CALCULATION SHEET

Washington Closure Hanford				
Originator: J. D. Skoglie	Date: 05/17/11	Calc. No.: 0100H-CA-V0164	Rev. No.: 0	
Project: 100-H Field Remediation	Job No.: 14655	Checked: T. E. Queen	Date: 05/17/11	
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 21 of 47	

116-H-5 Statistical Calculations

Verification Data -Overburden

Sample Area	Sample Number	Sample Date	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL	Fluoride mg/kg	Q	PQL	Nitrogen in nitrate [b] mg/kg	Q	PQL	Nitrogen in nitrate and nitrite mg/kg	Q	PQL	Sulfate mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	5.72		3.25	6.78		3.25	17.2		3.25	0.8	B	2.5	0.70		0.56	0.66		0.20	5.6		2.5
Duplicate of J19YF8	J19YH6	5/13/10	4.02		3.25	3.08	J	3.25	7.13		3.25	0.5	B	2.5	0.81		0.56	0.75		0.20	6.2		2.5
OB-1	J19YF4	5/13/10	0.839	J	3.35	1.31	J	3.35	1.44	J	3.35	0.7	B	2.5	0.56	U	0.56	0.56		0.20	2.9		2.5
OB-2	J19YF5	5/13/10	1.08	J	3.26	1.19	J	3.26	1.27	J	3.26	0.7	B	2.3	0.52	U	0.52	0.34		0.19	6.4		2.3
OB-3	J19YF6	5/13/10	1.56	J	3.35	1.38	J	3.35	3.14	J	3.35	0.7	B	2.4	1.29		0.54	1.41		0.19	6.6		2.4
OB-4	J19YF7	5/13/10	1.18	J	3.28	1.61	J	3.28	2.38	J	3.28	0.6	B	2.2	0.52		0.50	0.55		0.20	4.3		2.2
OB-6	J19YF9	5/13/10	7.89		3.24	4.49		3.24	9.13		3.24	0.8	B	2.3	1.60		0.52	1.25		0.21	14.2		2.3
OB-7	J19YH0	5/13/10	42.4		3.34	86.9		3.34	176		3.34	0.8	B	2.5	0.56	U	0.56	1.30		0.18	8.8		2.5
OB-8 re-sample 1[a]	J1FKL6	3/17/11	14.0	J	12.0	15.0	J	12.0	34.0	J	12.0	1.1	B	0.88	0.96	B	0.33	0.79	B	0.38	6.9		1.8
OB-9	J19YH2	5/13/10	71.3		3.25	201		3.25	290		3.25	0.7	B	2.4	0.52	B	0.54	0.66		0.19	3.0		2.4
OB-10	J19YH3	5/13/10	12.8		3.32	11.3		3.32	39.6		3.32	0.6	B	2.4	2.51		0.54	2.49		0.19	7.7		2.4
OB-11	J19YH4	5/13/10	68.8		3.18	14.1		3.18	51.9		3.18	1.0	B	2.5	0.90		0.56	0.99		0.18	7.4		2.5
OB-12	J19YH5	5/13/10	9.37		3.36	10.4		3.36	28.7		3.36	0.7	B	2.4	0.86		0.54	0.95		0.22	3.8		2.4
OB-13	J1B4H9	5/17/10	8.95		3.33	7.35		3.33	18.3		3.33	0.5	B	2.3	5.08		0.52	4.61		0.20	6.4		2.3
OB-14	J1B4J0	5/17/10	5.05		3.33	6.48		3.33	13.8		3.33	0.7	B	2.3	3.10		0.52	3.01		0.20	5.4		2.3
OB-15	J1B4J1	5/17/10	16.5		3.34	26.8		3.34	49.6		3.34	0.3	B	2.2	3.23		0.50	2.85		0.19	8.0		2.2

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg	Fluoride mg/kg	Nitrogen in nitrate [b] mg/kg	Nitrogen in nitrate and nitrite mg/kg	Sulfate mg/kg
OB-5	J19YF8/ J19YH6	5/13/10	4.87	4.93	12.2	0.7	0.76	0.71	5.9
OB-1	J19YF4	5/13/10	0.84	1.31	1.4	0.7	0.28	0.56	2.9
OB-2	J19YF5	5/13/10	1.08	1.19	1.3	0.7	0.26	0.34	6.4
OB-3	J19YF6	5/13/10	1.56	1.38	3.1	0.7	1.29	1.41	6.6
OB-4	J19YF7	5/13/10	1.18	1.61	2.4	0.6	0.52	0.55	4.3
OB-6	J19YF9	5/13/10	7.89	4.49	9.1	0.8	1.60	1.25	14.2
OB-7	J19YH0	5/13/10	42.4	86.9	176	0.8	0.28	1.30	8.8
OB-8 re-sample 1[a]	J1FKL6	3/17/11	14.0	15.0	34.0	1.1	0.96	0.79	6.9
OB-9	J19YH2	5/13/10	71.3	201	290	0.7	0.52	0.66	3.0
OB-10	J19YH3	5/13/10	12.8	11.3	39.6	0.6	2.51	2.49	7.7
OB-11	J19YH4	5/13/10	68.8	14.1	51.9	1.0	0.90	0.99	7.4
OB-12	J19YH5	5/13/10	9.37	10.4	28.7	0.7	0.86	0.95	3.8
OB-13	J1B4H9	5/17/10	8.95	7.35	18.3	0.5	5.08	4.61	6.4
OB-14	J1B4J0	5/17/10	5.05	6.48	13.8	0.7	3.10	3.01	5.4
OB-15	J1B4J1	5/17/10	16.5	26.8	49.6	0.3	3.23	2.85	8.0

Statistical Computations

	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Fluoride	Nitrogen in nitrate [b]	Nitrogen in nitrate and nitrite	Sulfate
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	15	15	15	15	15	15	15
% < Detection limit	0%	0%	0%	0%	20%	0%	0%
Mean	17.8	26.3	48.8	0.7	1.5	1.5	6.5
Standard deviation	23.6	52.9	79.7	0.2	1.4	1.2	2.8
95% UCL on mean	83.4	107	342	0.8	3.0	2.4	8.2
Maximum value	71.3	201	290	1.1	5.1	4.6	14.2
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	330 ug/kg GW & River Protection	240000 ug/kg GW Protection	48000 ug/kg GW Protection	96 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NO	NO	NO	NA	NA	NA	NA
> 10% above Cleanup Limit?	NO	NO	NO	NA	NA	NA	NA
Any sample > 2X Cleanup Limit?	NO	NO	NO	NA	NA	NA	NA
WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

Rev. No. 0
Date 05/17/11
Sheet No. 22 of 47

1 **116-H-5 Maximum Calculations**
2 **Verification Data -Overburden**

3	Sample	Sample	Sample	Silver			Bis(2-ethylhexyl)phthalate			Naphthalene			Acenaphthene		
4	Area	Number	Date	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	OB-5	J19YF8	5/13/10	0.813	U	0.813	331	U	331	3.25	U	3.25	3.25	U	3.25
6	Duplicate of J19YF8	J19YH6	5/13/10	0.951	U	0.951	330	U	330	3.25	U	3.25	3.25	U	3.25
7	OB-1	J19YF4	5/13/10	0.722	U	0.722	333	U	333	3.35	U	3.35	3.35	U	3.35
8	OB-2	J19YF5	5/13/10	0.912	U	0.912	324	U	324	3.26	U	3.26	3.26	U	3.26
9	OB-3	J19YF6	5/13/10	0.854	U	0.854	330	U	330	3.35	U	3.35	3.35	U	3.35
10	OB-4	J19YF7	5/13/10	0.840	U	0.840	331	U	331	3.28	U	3.28	3.28	U	3.28
11	OB-6	J19YF9	5/13/10	0.869	U	0.869	329	U	329	3.24	U	3.24	3.24	U	3.24
12	OB-7	J19YH0	5/13/10	0.855	U	0.855	323	U	323	3.34	U	3.34	3.34	U	3.34
13	OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.150	U	0.150	120	JB	48	12.0	U	12.0	10.0	U	10.0
14	OB-9	J19YH2	5/13/10	0.773	U	0.773	331	U	331	3.25	U	3.25	21.9		3.25
15	OB-10	J19YH3	5/13/10	0.933	U	0.933	331	U	331	3.32	U	3.32	3.32	U	3.32
16	OB-11	J19YH4	5/13/10	0.854	U	0.854	333	U	333	3.18	U	3.18	7.10		3.18
17	OB-12	J19YH5	5/13/10	0.776	U	0.776	328	U	328	3.36	U	3.36	3.36	U	3.36
18	OB-13	J1B4H9	5/17/10	0.138	B	0.652	331	U	331	25.1		3.33	7.96		3.33
19	OB-14	J1B4J0	5/17/10	0.156	B	0.772	328	U	328	3.33	U	3.33	3.33	U	3.33
20	OB-15	J1B4J1	5/17/10	0.881	U	0.881	331	U	331	3.34	U	3.34	3.34	U	3.34

3	Sample Number	Anthracene			Fluorene			4,4'-DDE			Chloride			TPH-diesel range			TPH-diesel range EXT			TPH-motor oil (high boiling)		
4		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	J19YF8	1.66	J	3.25	3.25	U	3.25	1.33	UD	1.33	2.5	U	2.5	3360	U	3360				10100	U	10100
6	J19YH6	3.25	U	3.25	3.25	U	3.25	1.32	UD	1.32	2.5	U	2.5	3350	U	3350				10000	U	10000
7	J19YF4	3.35	U	3.35	3.35	U	3.35	1.34	UD	1.34	20.6		2.5	3350	U	3350				10100	U	10100
8	J19YF5	3.26	U	3.26	3.26	U	3.26	1.33	UD	1.33	2.3	U	2.3	3330	U	3330				9980	U	9980
9	J19YF6	3.35	U	3.35	3.35	U	3.35	1.32	UD	1.32	2.4	U	2.4	3340	U	3340				10000	U	10000
10	J19YF7	3.28	U	3.28	3.28	U	3.28	1.33	UD	1.33	3.6		2.2	3360	U	3360				10100	U	10100
11	J19YF9	3.24	U	3.24	3.24	U	3.24	1.34	UD	1.34	2.3	U	2.3	3330	U	3330				5970	J	10000
12	J19YH0	37.5		3.34	4.38		3.34	1.33	UD	1.33	6.9		2.5	3300	U	3300				9900	U	9900
13	J1FKL6	3.10	U	3.10	5.40	U	5.40	0.45	JX	0.25	2.8	B	2.1	3200	J	720	6500		1100	8510	J	10100
14	J19YH2	58.4		3.25	32.3		3.25	1.34	UD	1.34	2.4	U	2.4	3340	U	3340				10000	U	10000
15	J19YH3	1.88	J	3.32	1.36	J	3.32	1.32	UD	1.32	2.4	U	2.4	3340	U	3340				10000	U	10000
16	J19YH4	2.43	J	3.18	1.11	J	3.18	1.32	UD	1.32	2.5	U	2.5	3340	U	3340				15000		10000
17	J19YH5	1.41	J	3.36	3.36	U	3.36	1.34	UD	1.34	2.4	U	2.4	3340	U	3340				10000	U	10000
18	J1B4H9	3.33	U	3.33	3.33	U	3.33	1.33	UD	1.33	2.3	U	2.3	3360	U	3360				11500		10100
19	J1B4J0	3.33	U	3.33	3.33	U	3.33	1.33	UD	1.33	2.3	U	2.3	3310	U	3310				6810	J	9930
20	J1B4J1	2.59	J	3.34	1.71	J	3.34	1.34	UD	1.34	2.2	U	2.2	3340	U	3340				8950	J	10000

21
22 **Statistical Computations**

23		Silver	Bis(2-ethylhexyl)phthalate	Naphthalene	Acenaphthene	Anthracene	Fluorene	4,4'-DDE	Chloride	TPH-diesel range	TPH-diesel range EXT	TPH-motor oil (high boiling)
24	% < Detection limit	87%	93%	93%	80%	53%	67%	93%	73%	93%	0%	60%
25	Maximum value	0.156	120	25.1	21.9	58.4	32.3	0.45	20.6	3200	6500	15000
26	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	0.73 River Protection	360 ug/kg River Protection	16000 ug/kg GW Protection	96000 ug/kg GW Protection	240000 ug/kg GW Protection	64000 ug/kg GW Protection	3.3 ug/kg River Protection	25000 GW Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection
27	**3-PART TEST**											
28	Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO
29	> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO
30	Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NA	NO	NO	NO
31	**3-Part Test Compliance?**	Because all values are below background (0.73 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (100 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
Sheet No. 23 of 47

116-H-5 Statistical Calculations

Verification Data -Staging Pile Area

Sample Area	Sample Number	Sample Date	Cesium-137			Technetium-99			Uranium-233/234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0	U	0.0804	0.165	U	0.607	0.127		0.120	0.0772	U	0.101
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0326	U	0.0608	0.177	U	0.626	0.0580	U	0.139	0.236		0.163
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.0180	U	0.0258	0.403	U	0.625	0.218		0.142	0.174		0.135
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0	U	0.0341	0.288	U	0.624	0.043	U	0.105	0.115		0.0873
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0	U	0.0262	0.520	U	0.617	0.162		0.0870	0.160		0.0970
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.0528	U	0.0969	0.397	U	0.621	0.138		0.130	0.0244	U	0.126
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0515	U	0.0571	0.256	U	0.618	0.141	U	0.154	0.132	U	0.180
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0679		0.0285	0.439	U	0.650	0.0757	U	0.147	0.130	U	0.153
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0	U	0.0279	0.485	U	0.615	0.207		0.119	0.183		0.0988
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0	U	0.0322	0.237	U	0.645	0.453		0.106	0.224		0.114
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0	U	0.0312	0.427	U	0.633	0.187		0.100	0.211		0.112
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0	U	0.0343	0.575	U	0.615	0.141		0.111	0.0711	U	0.0931
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.0167	U	0.0248	0.809		0.656	0.0717	U	0.178	0.189		0.173

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Cesium-137 pCi/g	Technetium-99 pCi/g	Uranium-233/234 pCi/g	Uranium-238 pCi/g
SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	0.0163	0.171	0.0925	0.157
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.0180	0.403	0	0
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0	0.288	0	0.115
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0	0.520	0.162	0.160
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.0528	0.397	0.138	0.0244
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0515	0.256	0	0.132
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0679	0.439	0.0757	0.130
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0	0.485	0.207	0
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0	0.237	0.453	0.224
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0	0.427	0.187	0.211
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0	0.575	0	0.0711
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.0167	0.809	0.0717	0.189

Statistical Computations

	Cesium-137	Technetium-99	Uranium-233/234	Uranium-238
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
N	12	12	12	12
% < Detection limit	92%	92%	33%	33%
Mean	0.0127	0.417	0.0290	1.07
Standard deviation	0.0248	0.173	0.112	0.0575
Z-statistic	1.64	1.64	1.64	1.64
95% UCL on mean	0.0245	0.499	0.0822	1.10
Maximum value	0.0679	0.809	0.453	0.236

CALCULATION SHEET

Washington Closure Hanford			
Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 24 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Staging Pile Area**

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	1.7		0.58	32.9	X	0.067	0.085	B	0.029	0.86	U	0.86	0.054	B	0.036	8.8	X	0.051	4.9	X	0.088	12.3		0.19	2.7	X	0.24	222	X	0.088
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	2.1		0.69	36.4	X	0.079	0.074	B	0.034	1.0	U	1.0	0.079	B	0.043	9.6	X	0.060	5.1	X	0.10	11.4		0.23	2.4	X	0.28	225	X	0.10
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	2.2		0.59	36.4	X	0.067	0.089	B	0.029	0.88	B	0.87	0.043	B	0.036	9.2	X	0.051	4.9	X	0.089	11.3		0.19	2.0	X	0.24	218	X	0.089
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	1.7		0.64	33.5	X	0.074	0.079	B	0.032	0.95	U	0.95	0.049	B	0.040	9.4	X	0.056	5.2	X	0.097	12.1		0.21	2.1	X	0.26	231	X	0.097
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	1.5		0.57	37.3	X	0.066	0.069	B	0.029	0.85	U	0.85	0.077	B	0.036	6.1	X	0.050	4.5	X	0.087	12.5		0.19	2.3	X	0.23	182	X	0.087
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	7.8		0.58	88.8	X	0.067	0.15	B	0.029	6.9		0.87	0.15	B	0.036	11.0	X	0.051	6.3	X	0.088	15.9		0.19	30.7	X	0.24	254	X	0.088
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.1		0.59	60.5	X	0.068	0.15	B	0.030	2.1		0.88	0.11	B	0.037	9.6	X	0.052	6.0	X	0.090	13.5		0.19	35.3	X	0.24	252	X	0.090
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	14.1		0.69	126	X	0.079	0.17	B	0.034	1.7	B	1.0	0.12	B	0.043	11.9	X	0.061	7.2	X	0.10	15.6		0.23	70.5	X	0.28	300	X	0.10
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	6.7		0.70	68.3	X	0.080	0.10	B	0.035	1.2	B	1.0	0.10	B	0.043	10.5	X	0.061	7.2	X	0.11	17.0		0.23	20.0	X	0.29	286	X	0.11
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	12.2		0.67	82.9	X	0.077	0.22		0.033	1.4	B	0.99	0.14	B	0.041	13.1	X	0.058	7.9	X	0.10	14.9		0.22	32.7	X	0.27	362	X	0.10
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	3.4		0.65	40.6	X	0.075	0.047	B	0.032	0.96	U	0.96	0.059	B	0.040	9.4	X	0.057	6.7	X	0.098	14.0		0.21	5.5	X	0.27	230	X	0.098
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	2.2		0.56	43.0	X	0.065	0.028	B	0.028	0.84	U	0.84	0.077	B	0.035	9.4	X	0.050	6.8	X	0.086	12.9		0.19	2.3	X	0.23	241	X	0.086
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	14.2		0.59	72.5	X	0.068	0.16	B	0.030	1.8		0.88	0.12	B	0.037	11.6	X	0.052	6.8	X	0.090	14.0		0.20	58.5	X	0.24	294	X	0.090

19 **Statistical Computation Input Data**

	Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
22	SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	1.9	34.7	0.080	0.47	0.067	9.2	5.0	11.9	2.55	224
23	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	2.2	36.4	0.089	0.88	0.043	9.2	4.9	11.3	2.00	218
24	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	1.7	33.5	0.079	0.48	0.049	9.4	5.2	12.1	2.10	231
25	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	1.5	37.3	0.069	0.43	0.077	6.1	4.5	12.5	2.30	182
26	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	7.8	88.8	0.15	6.9	0.15	11.0	6.3	15.9	30.7	254
27	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.1	60.5	0.15	2.1	0.11	9.6	6.0	13.5	35.3	252
28	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	14.1	126	0.17	1.7	0.12	11.9	7.2	15.6	70.5	300
29	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	6.7	68.3	0.10	1.2	0.10	10.5	7.2	17.0	20.0	286
30	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	12.2	82.9	0.22	1.4	0.14	13.1	7.9	14.9	32.7	362
31	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	3.4	40.6	0.047	0.48	0.059	9.4	6.7	14.0	5.50	230
32	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	2.2	43.0	0.028	0.42	0.077	9.4	6.8	12.9	2.30	241
33	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	14.2	72.5	0.16	1.8	0.12	11.6	6.8	14.0	58.5	294

34 **Statistical Computations**

		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat normal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	42%	0%	0%	0%	0%	0%	0%
39	Mean	6.4	60.4	0.11	1.5	0.093	10.0	6.2	13.8	22.0	256
40	Standard deviation	5.0	28.6	0.057	1.8	0.036	1.8	1.1	1.78	23.9	48
41	95% UCL on mean	14.0	80.0	0.17	2.4	0.12	11.0	6.9	14.8	33.4	283
42	Maximum value	14.2	126	0.22	6.9	0.15	13.1	7.9	17.0	70.5	362
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW & River Protection
44	**WAC 173-340 3-PART TEST**										
45	95% UCL > Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	YES	NA
46	> 10% above Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	YES	NA
47	Any sample > 2X Cleanup Limit?	NO	NA	NA	NO	NA	NA	NA	NA	YES	NA
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie **Date** 05/17/11 **Calc. No.** 0100H-CA-V0164 **Rev. No.** 0
Project 100-H Field Remediation **Job No.** 14655 **Checked** T. E. Queen **Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 25 of 47

1 **116-H-5 Statistical Calculations**
2 **Verification Data -Staging Pile Area**

	Sample	Sample	Sample	Nickel			Vanadium			Zinc			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(k)fluoranthene			Chrysene			Indeno(1,2,3-cd)pyrene			Phenanthrene		
3/4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	8.3	X	0.11	35.8		0.083	28.4	X	0.35	230		3.1	170		6.2	190		4.1	87		3.8	160		4.7	120		12	240		12
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	10.3	X	0.13	38.0		0.098	28.1	X	0.41	170		3.1	120		6.2	140		4.0	69		3.8	140		4.6	110		12	130		12
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	9.4	X	0.11	36.8		0.083	26.4	X	0.35	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3	4.1	U	4.1	5.0	U	5.0	12	U	12	12	U	12
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	10.5	X	0.12	38.4		0.091	27.9	X	0.39	3.3	U	3.3	6.8	J	6.6	4.3	U	4.3	4.1	U	4.1	5.0	U	5.0	12	U	12	12	U	12
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	7.0	X	0.11	36.4		0.081	25.7	X	0.35	25	X	3.1	17		6.2	20		4.1	11	JX	3.8	27	J	4.7	12	J	12	13	J	12
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	10.8	X	0.11	41.1		0.083	40.6	X	0.35	19		3.1	22		6.2	25		4.1	9.8	J	3.8	21	J	4.7	16	J	12	12	U	12
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.5	X	0.11	36.1		0.084	36.4	X	0.36	21		3.3	27		6.6	20		4.3	10	J	4.1	24	J	5.0	21	J	12	19	J	12
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	11.2	X	0.13	46.4		0.098	44.8	X	0.42	22		3.2	37		6.5	20		4.2	8.9	J	4.0	26	J	4.9	17	J	12	17	J	12
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	9.7	X	0.13	59.2		0.099	44.6	X	0.42	31		3.3	25		6.6	21		4.3	9.7	J	4.0	29	J	5.0	20	J	12	32	J	12
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	12.8	X	0.12	45.4		0.095	48.6	X	0.40	8.9	J	3.5	9.6	J	6.9	4.5	U	4.5	4.3	U	4.3	8.7	J	5.2	13	U	13	13	U	13
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	10.2	X	0.12	49.8		0.092	32.8	X	0.39	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1	3.8	U	3.8	4.7	U	4.7	12	U	12	12	U	12
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	8.0	X	0.11	53.3		0.080	32.9	X	0.34	3.2	U	3.2	6.5	U	6.5	4.3	U	4.3	4.0	U	4.0	4.9	U	4.9	12	U	12	12	U	12
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	10.6	X	0.11	45.8		0.085	43.5	X	0.36	44		3.3	27		6.6	37		4.3	14	J	4.1	35	J	5.0	27	J	12	14	J	12

19 **Statistical Computation Input Data**

	Sample	Sample	Sample	Nickel	Vanadium	Zinc	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Indeno(1,2,3-cd)pyrene	Phenanthrene
20/21	Area	Number	Date	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
22	SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	9.3	36.9	28.3	200	145	165	78	150	115	185
23	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	9.4	36.8	26.4	1.7	3.3	2.2	2.1	2.5	6.0	6.0
24	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	10.5	38.4	27.9	1.7	6.8	2.2	2.1	2.5	6.0	6.0
25	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	7.0	36.4	25.7	25	17	20	11	27	12	13
26	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	10.8	41.1	40.6	19	22	25	9.8	21	16	6.0
27	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	9.5	36.1	36.4	21	27	20	10	24	21	19
28	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	11.2	46.4	44.8	22	37	20	8.9	26	17	17
29	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	9.7	59.2	44.6	31	25	21	9.7	29	20	32
30	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	12.8	45.4	48.6	8.9	9.6	2.3	2.2	8.7	6.5	6.5
31	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	10.2	49.8	32.8	1.6	3.2	2.1	1.9	2.4	6.0	6.0
32	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	8.0	53.3	32.9	1.6	3.3	2.2	2.0	2.5	6.0	6.0
33	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	10.6	45.8	43.5	44	27	37	14	35	27	14

34 **Statistical Computations**

35		Nickel	Vanadium	Zinc	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Indeno(1,2,3-cd)pyrene	Phenanthrene
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12	12	12
38	% < Detection limit	0%	0%	0%	33%	25%	42%	42%	33%	42%	50%
39	Mean	9.9	43.8	36.0	31	27	27	13	28	22	26
40	Standard deviation	1.5	7.5	8.2	55	39	45	21	40	30	51
41	95% UCL on mean	10.8	48.0	41.1	58	88.5	48	23	47	36	50
42	Maximum value	12.8	59.2	48.6	230	170	190	87	160	120	240
43	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	15 ug/kg GW & River Protection	100 ug/kg GW & River Protection	330 ug/kg GW & River Protection	240000 ug/kg GW Protection
44	WAC 173-340 3-PART TEST										
45	95% UCL > Cleanup Limit?	NA	NA	NA	YES	YES	YES	YES	NO	NO	NO
46	> 10% above Cleanup Limit?	NA	NA	NA	YES	YES	YES	YES	NO	NO	NO
47	Any sample > 2X Cleanup Limit?	NA	NA	NA	YES	YES	YES	YES	NO	NO	NO
48	WAC 173-340 Compliance?	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie

Project 100-H Field Remediation

Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11

Job No. 14655

Calc. No. 0100H-CA-V0164

Checked T. E. Queen

Rev. No. 0

Date 05/17/11

Sheet No. 26 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Staging Pile Area**

3	Sample	Sample	Sample	Pyrene			Bis(2-ethylhexyl)phthalate			Fluoride			Nitrogen in nitrate [b]			Nitrogen in Nitrite and Nitrate			Sulfate			TPH - diesel range			TPH - diesel range EXT		
4	Area	Number	Date	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	400		12	110	JB	46	0.81	U	0.81	0.43	B	0.31	0.36	U	0.36	1.7	B	1.7	6900		690	15000		1000
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	300		12	110	JB	46	0.84	U	0.84	0.41	B	0.32	0.37	U	0.37	1.9	B	1.8	2200	J	690	5700		1000
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	12	U	12	110	JB	46	0.83	U	0.83	0.35	B	0.32	0.35	U	0.35	2.1	B	1.7	690	U	690	1000	U	1000
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	12	U	12	110	JB	44	0.82	U	0.82	0.36	B	0.31	0.37	U	0.37	1.7	U	1.7	640	U	640	940	U	940
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	54		12	100	JB	45	0.85	U	0.85	0.36	B	0.32	0.37	U	0.37	2.0	B	1.8	690	U	690	1000	U	1000
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	30	J	12	130	JB	47	0.86	U	0.86	40.1		0.33	39.9		0.37	43.6		1.8	11000		710	41000		1000
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	51		12	130	JB	49	0.95	B	0.89	44.8		0.34	50.9		0.36	18.2		1.9	8500		720	30000		1100
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	54		12	120	JB	49	1.1	B	0.83	0.61	B	0.32	0.43	B	0.38	2.0	B	1.8	9500		720	35000		1100
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	70		12	120	JB	47	1.8	B	0.87	0.94	B	0.33	0.85		0.38	55.6		1.8	7100		690	12000		1000
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	21	J	13	120	JB	50	0.96	B	0.91	0.55	B	0.35	0.46	B	0.40	2.8	B	1.9	4400		740	7700		1100
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	12	U	12	110	JB	46	0.88	B	0.82	0.41	B	0.31	0.36	U	0.36	5.4		1.7	820	J	690	2100	J	1000
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	12	U	12	110	JB	45	1.1	B	0.84	1.1	B	0.32	1.1		0.36	9.1		1.8	690	U	690	1000	U	1000
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	65		12	130	JB	47	0.97	B	0.85	0.76	B	0.32	0.62	B	0.38	3.3	B	1.8	4000	J	700	8800		1000

19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Pyrene	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH - diesel range	TPH - diesel range EXT
21	Area	Number	Date	ug/kg	ug/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg
22	SPA-4 re-sample 1[a]	J1FKM0/ J1FKM9	3/17/11	350	110	0.41	0.42	0.18	1.8	4550	10350
23	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	6.0	110	0.42	0.35	0.18	2.1	345	500
24	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	6.0	110	0.41	0.36	0.19	0.9	320	470
25	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	54	100	0.43	0.36	0.19	2.0	345	500
26	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	30	130	0.43	40.1	39.9	43.6	11000	41000
27	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	51	130	0.95	44.8	50.9	18.2	8500	30000
28	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	54	120	1.1	0.61	0.43	2.0	9500	35000
29	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	70	120	1.8	0.94	0.85	55.6	7100	12000
30	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	21	120	0.96	0.55	0.46	2.8	4400	7700
31	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	6.0	110	0.88	0.41	0.18	5.4	820	2100
32	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	6.0	110	1.1	1.1	1.1	9.1	345	500
33	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	65	130	0.97	0.76	0.62	3.3	4000	8800

34 **Statistical Computations**

35		Pyrene	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in nitrate [b]	Nitrogen in Nitrite and Nitrate	Sulfate	TPH - diesel range	TPH - diesel range EXT
36	95% UCL based on	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥10), lognormal and normal distribution rejected, use z-statistic.
37	N	12	12	12	12	12	12	12	12
38	% < Detection limit	33%	0%	42%	0%	42%	8%	33%	33%
39	Mean	60	117	0.82	7.6	7.9	12.2	4269	12410
40	Standard deviation	95	10	0.42	16.3	17.7	18.3	3959	14620
41	95% UCL on mean	105	121	1.0	15.3	16.0	51.6	6149	19353
42	Maximum value	400	130	1.8	44.8	50.9	55.6	11000	41000
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	48000 ug/kg GW Protection	360 ug/kg River Protection	96.0 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection	200000 ug/kg DE, GW & River Protection	200000 ug/kg DE, GW & River Protection
44	**WAC 173-340 3-PART TEST**								
45	95% UCL > Cleanup Limit?	NO	NO	NA	NO	NO	NA	NO	NO
46	> 10% above Cleanup Limit?	NO	NO	NA	NO	NO	NA	NO	NO
47	Any sample > 2X Cleanup Limit?	NO	NO	NA	NO	NO	NA	NO	NO
48	**WAC 173-340 Compliance?**	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	**Date**	05/17/11	**Calc. No.**	0100H-CA-V0164
Project	100-H Field Remediation	**Job No.**	14655	**Checked**	T. E. Queen
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations				
Rev. No.	0	**Date**	05/17/11	**Sheet No.**	27 of 47

1 **116-H-5 Statistical Calculations**

2 **Verification Data -Staging Pile Area**

	Sample	Sample	Sample	TPH - motor oil (high boiling)		
4	**Area**	**Number**	**Date**	**ug/kg**	**Q**	**PQL**
5	SPA-8	J19YJ4	5/17/10	40800		10100
6	Duplicate of J19YJ4	J19YJ9	5/17/10	64900		10100
7	SPA-1	J19YH7	5/17/10	184000		9910
8	SPA-2	J19YH8	5/17/10	17400		9800
9	SPA-3	J19YH9	5/17/10	10400		10100
10	SPA-4	J19YJ0	5/17/10	8660	J	9920
11	SPA-5	J19YJ1	5/17/10	14900		9990
12	SPA-6	J19YJ2	5/17/10	141000		10100
13	SPA-7	J19YJ3	5/17/10	10500		9970
14	SPA-9	J19YJ5	5/17/10	60800		10100
15	SPA-10	J19YJ6	5/17/10	58900		10000
16	SPA-11	J19YJ7	5/17/10	39100		9930
17	SPA-12	J19YJ8	5/17/10	53900		10000

19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	TPH - motor oil (high boiling)
21	**Area**	**Number**	**Date**	**ug/kg**
22	SPA-8	J19YJ4/ J19YJ9	5/17/10	52850
23	SPA-1	J19YH7	5/17/10	184000
24	SPA-2	J19YH8	5/17/10	17400
25	SPA-3	J19YH9	5/17/10	10400
26	SPA-4	J19YJ0	5/17/10	8660
27	SPA-5	J19YJ1	5/17/10	14900
28	SPA-6	J19YJ2	5/17/10	141000
29	SPA-7	J19YJ3	5/17/10	10500
30	SPA-9	J19YJ5	5/17/10	60800
31	SPA-10	J19YJ6	5/17/10	58900
32	SPA-11	J19YJ7	5/17/10	39100
33	SPA-12	J19YJ8	5/17/10	53900

34 **Statistical Computations**

35		**TPH - motor oil (high boiling)**	
36	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	
37	N	12	
38	% < Detection limit	0%	
39	Mean	54368	
40	Standard deviation	55168	
41	95% UCL on mean	147061	
42	Maximum value	184000	
43	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	200000 ug/kg	DE, GW & River Protection
44	**WAC 173-340 3-PART TEST**		
45	95% UCL > Cleanup Limit?	NO	
46	> 10% above Cleanup Limit?	NO	
47	Any sample > 2X Cleanup Limit?	NO	
48	WAC 173-340 Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
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1 **116-H-5 Maximum Calculations**

2 **Verification Data -Staging Pile Area**

	Sample Area	Sample Number	Sample Date	Mercury			Molybdenum			Acenaphthylene			Anthracene			Benzo(ghi)perylene			Dibenz[a,h]anthracene			Fluoranthene			Fluorene			Aroclor-1254		
4				mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.0054	U	0.0054	0.23	U	0.23	8.7	U	8.7	87		3.0	96		7.0	26	JX	11	400		13	57		5.1	2.7	U	2.7
6	Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0052	U	0.0052	0.27	U	0.27	8.6	U	8.6	48		2.9	38	X	6.9	19	JX	11	290		12	31		5.1	2.6	U	2.6
7	SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.0056	U	0.0056	0.23	U	0.23	9.3	U	9.3	3.1	U	3.1	7.4	U	7.4	11	U	11	13	U	13	5.4	U	5.4	2.6	U	2.6
8	SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.0056	U	0.0056	0.25	U	0.25	27	J	9.3	3.1	U	3.1	7.4	U	7.4	11	U	11	13	U	13	5.4	U	5.4	2.5	U	2.5
9	SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.0058	U	0.0058	0.23	U	0.23	8.8	U	8.8	3.5	J	3.0	7.0	U	7.0	11	U	11	45		13	5.1	U	5.1	2.6	U	2.6
10	SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.013	B	0.0056	0.33	B	0.23	8.7	U	8.7	3.0	U	3.0	7.0	U	7.0	11	U	11	17	JX	13	5.1	U	5.1	15		2.6
11	SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0080	B	0.0057	0.23	U	0.23	9.3	U	9.3	3.2	U	3.2	7.4	U	7.4	11	U	11	13	U	13	5.5	U	5.5	2.8	U	2.8
12	SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0083	B	0.0060	0.27	U	0.27	9.1	U	9.1	3.1	U	3.1	7.3	U	7.3	11	U	11	13	U	13	5.3	U	5.3	2.8	U	2.8
13	SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.014	B	0.0056	0.28	U	0.28	9.2	U	9.2	3.1	U	3.1	7.4	U	7.4	11	U	11	13	U	13	5.4	U	5.4	2.8	U	2.8
14	SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.0053	U	0.0053	0.26	U	0.26	9.7	U	9.7	3.3	U	3.3	7.8	U	7.8	12	U	12	14	U	14	5.7	U	5.7	2.8	U	2.8
15	SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.0054	U	0.0054	0.26	U	0.26	8.8	U	8.8	3.0	U	3.0	7.0	U	7.0	11	U	11	13	U	13	5.2	U	5.2	2.5	U	2.5
16	SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.0057	U	0.0057	0.22	U	0.22	9.1	U	9.1	3.1	U	3.1	7.3	U	7.3	11	U	11	13	U	13	5.4	U	5.4	2.6	U	2.6
17	SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.011	BN	0.0054	0.23	U	0.23	9.3	U	9.3	3.2	U	3.2	7.5	U	7.5	11	U	11	13	U	13	5.5	U	5.5	2.6	U	2.6

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19 **Statistical Computations**

20		Mercury	Molybdenum	Acenaphthylene	Anthracene	Benzo(ghi)perylene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Aroclor-1254
21	% < Detection limit	58%	92%	92%	83%	92%	92%	75%	92%	92%
22	Maximum value	0.014	0.33	27	87	96	26	400	57	15
23	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	0.33 GW & River Protection	8 GW Protection	96000 ug/kg GW Protection	240000 ug/kg GW Protection	48000 ug/kg GW & River Protection	30 ug/kg GW & River Protection	18000 ug/kg River Protection	64000 ug/kg GW Protection	17 ug/kg GW & River Protection
24	**3-PART TEST**									
25	Maximum > Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
26	> 10% above Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
27	Any sample > 2X Cleanup Limit?	NA	NO	NO	NO	NO	NO	NO	NO	NO
28	**3-Part Test Compliance?**	Because all values are below background (0.33 mg/kg) the 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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116-H-5 Maximum Calculations

Verification Data -Staging Pile Area

Sample Area	Sample Number	Sample Date	Aroclor-1260			4,4'-DDE			4,4'-DDT			Chloride		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	2.7	U	2.7	0.24	U	0.24	0.59	U	0.59	1.9	U	1.9
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	2.6	U	2.6	0.25	U	0.25	0.61	U	0.61	2.0	U	2.0
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	2.6	U	2.6	0.24	U	0.24	0.59	U	0.59	2.0	U	2.0
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	2.5	U	2.5	0.24	U	0.24	0.60	U	0.60	2.0	U	2.0
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	2.6	U	2.6	0.25	U	0.25	0.61	U	0.61	2.0	U	2.0
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	10		2.6	14		0.25	5.3		0.61	9.5		2.0
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	2.8	U	2.8	40	DN	0.51	4.4		0.63	6.4		2.1
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	2.8	U	2.8	1.1	J	0.25	0.74	J	0.63	2.0	U	2.0
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	2.8	U	2.8	0.46	JX	0.25	0.62	U	0.62	2.1	U	2.1
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	2.8	U	2.8	0.26	U	0.26	0.65	U	0.65	2.2	U	2.2
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	2.5	U	2.5	0.24	U	0.24	0.59	U	0.59	2.0	U	2.0
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	2.6	U	2.6	0.24	U	0.24	0.58	U	0.58	5.0	B	2.0
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	2.6	U	2.6	0.33	JX	0.25	0.61	U	0.61	2.0	U	2.0

Statistical Computations

	Aroclor-1260			4,4'-DDE			4,4'-DDT			Chloride		
% < Detection limit	92%			58%			75%			75%		
Maximum value	10			40			5.3			9.5		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	17 ug/kg	GW & River Protection		3.3 ug/kg	River Protection		3.3 ug/kg	River Protection		25000	GW Protection	
3-PART TEST												
Maximum > Cleanup Limit?	NO			YES			YES			NA		
> 10% above Cleanup Limit?	NO			YES			YES			NA		
Any sample > 2X Cleanup Limit?	NO			YES			NO			NA		
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.			The data set meets the 3-part test criteria when compared to the direct exposure RAG.			The data set meets the 3-part test criteria when compared to the direct exposure RAG.			Because all values are below background (100 mg/kg) the 3-part test is not required.		

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	**Date**	05/17/11	**Calc. No.**	0100H-CA-V0164
Project	100-H Field Remediation	**Job No.**	14655	**Checked**	T. E. Queen
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations	**Rev. No.**	0	**Date**	05/17/11
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Ecology Software (MTCAStat) Results, 116-H-5 Shallow Zone

Arsenic 95% UCL Calculation

DATA	ID
4.13	J19YB9/ J19YD0
2.13	J19YB8
2.83	J19YC0
5.32	J19YC1
6.45	J19YC2
3.75	J19YC3
6.58	J19YC4
4.84	J19YC5
4.80	J1FKL4
7.65	J19YC7
1.10	J1FKL5
3.06	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	4.39
Censored		Lognormal mean	4.54
Detection limit or PQL		Std. devn.	1.94
Method detection limit		Median	4.47
TOTAL	12	Min.	1.10
		Max.	7.65

Lognormal distribution? r-squared is: 0.919
Normal distribution? r-squared is: 0.991
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.53

Barium 95% UCL Calculation

DATA	ID
64.0	J19YB9/ J19YD0
33.6	J19YB8
69.8	J19YC0
51.9	J19YC1
46.7	J19YC2
63.4	J19YC3
52.0	J19YC4
62.2	J19YC5
69.6	J1FKL4
54.8	J19YC7
43.0	J1FKL5
50.7	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	55.1
Censored		Lognormal mean	55.3
Detection limit or PQL		Std. devn.	11.0
Method detection limit		Median	53.4
TOTAL	12	Min.	33.6
		Max.	69.8

Lognormal distribution? r-squared is: 0.929
Normal distribution? r-squared is: 0.960
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 62.4

Beryllium 95% UCL Calculation

DATA	ID
0.248	J19YB9/ J19YD0
0.130	J19YB8
0.208	J19YC0
0.172	J19YC1
0.192	J19YC2
0.216	J19YC3
0.193	J19YC4
0.206	J19YC5
0.110	J1FKL4
0.181	J19YC7
0.015	J1FKL5
0.155	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.169
Censored		Lognormal mean	0.193
Detection limit or PQL		Std. devn.	0.061
Method detection limit		Median	0.187
TOTAL	12	Min.	0.015
		Max.	0.248

Lognormal distribution? r-squared is: 0.568
Normal distribution? r-squared is: 0.865
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.198

Boron 95% UCL Calculation

DATA	ID
1.17	J19YB9/ J19YD0
0.76	J19YB8
3.44	J19YC0
1.26	J19YC1
1.12	J19YC2
1.26	J19YC3
1.18	J19YC4
1.34	J19YC5
1.00	J1FKL4
0.97	J19YC7
0.43	J1FKL5
1.00	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	1.24
Censored		Lognormal mean	1.24
Detection limit or PQL		Std. devn.	0.74
Method detection limit		Median	1.14
TOTAL	12	Min.	0.43
		Max.	3.44

Lognormal distribution? r-squared is: 0.813
Normal distribution? r-squared is: 0.613
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.59

Cadmium 95% UCL Calculation

DATA	ID
0.093	J19YB9/ J19YD0
0.041	J19YB8
0.086	J19YC0
0.065	J19YC1
0.060	J19YC2
0.059	J19YC3
0.052	J19YC4
0.101	J19YC5
0.074	J1FKL4
0.059	J19YC7
0.070	J1FKL5
0.105	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.072
Censored		Lognormal mean	0.072
Detection limit or PQL		Std. devn.	0.020
Method detection limit		Median	0.068
TOTAL	12	Min.	0.041
		Max.	0.105

Lognormal distribution? r-squared is: 0.969
Normal distribution? r-squared is: 0.957
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.0853

Chromium 95% UCL Calculation

DATA	ID
18.6	J19YB9/ J19YD0
8.93	J19YB8
12.7	J19YC0
10.4	J19YC1
11.0	J19YC2
12.8	J19YC3
11.7	J19YC4
12.6	J19YC5
9.90	J1FKL4
10.2	J19YC7
5.30	J1FKL5
13.1	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	11.4
Censored		Lognormal mean	11.5
Detection limit or PQL		Std. devn.	3.12
Method detection limit		Median	11.4
TOTAL	12	Min.	5.30
		Max.	18.6

Lognormal distribution? r-squared is: 0.859
Normal distribution? r-squared is: 0.890
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.9

Cobalt 95% UCL Calculation

DATA	ID
5.88	J19YB9/ J19YD0
4.91	J19YB8
5.79	J19YC0
6.11	J19YC1
5.45	J19YC2
6.41	J19YC3
5.82	J19YC4
5.65	J19YC5
6.60	J1FKL4
5.60	J19YC7
7.60	J1FKL5
5.38	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	5.93
Censored		Lognormal mean	5.94
Detection limit or PQL		Std. devn.	0.69
Method detection limit		Median	5.81
TOTAL	12	Min.	4.91
		Max.	7.60

Lognormal distribution? r-squared is: 0.934
Normal distribution? r-squared is: 0.901
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.30

Copper 95% UCL Calculation

DATA	ID
12.0	J19YB9/ J19YD0
12.2	J19YB8
13.1	J19YC0
16.1	J19YC1
13.0	J19YC2
12.8	J19YC3
13.3	J19YC4
12.0	J19YC5
17.3	J1FKL4
14.3	J19YC7
14.5	J1FKL5
12.5	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	13.6
Censored		Lognormal mean	13.6
Detection limit or PQL		Std. devn.	1.68
Method detection limit		Median	13.1
TOTAL	12	Min.	12.0
		Max.	17.3

Lognormal distribution? r-squared is: 0.892
Normal distribution? r-squared is: 0.864
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 14.4

Lead 95% UCL Calculation

DATA	ID
5.04	J19YB9/ J19YD0
3.44	J19YB8
8.37	J19YC0
15.2	J19YC1
15.9	J19YC2
6.41	J19YC3
17.3	J19YC4
15.1	J19YC5
8.00	J1FKL4
24.2	J19YC7
2.30	J1FKL5
5.80	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	10.6
Censored		Lognormal mean	11.1
Detection limit or PQL		Std. devn.	6.76
Method detection limit		Median	8.19
TOTAL	12	Min.	2.30
		Max.	24.2

Lognormal distribution? r-squared is: 0.961
Normal distribution? r-squared is: 0.922
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.8

CALCULATION SHEET

Washington Closure Hanford			
Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 31 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Shallow Zone

Manganese 95% UCL Calculation

DATA	ID				
267	J19YB9/ J19YD0				
227	J19YB8				
268	J19YC0	Number of samples		Uncensored values	
257	J19YC1	Uncensored	12	Mean	261
263	J19YC2	Censored		Lognormal mean	261
274	J19YC3	Detection limit or PQL		Std. devn.	16.6
272	J19YC4	Method detection limit		Median	267
270	J19YC5	TOTAL	12	Min.	227
284	J1FKL4			Max.	284
266	J19YC7				
234	J1FKL5				
251	J19YC9				

Lognormal distribution? r-squared is: 0.876
Normal distribution? r-squared is: 0.893
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 269

Molybdenum 95% UCL Calculation

DATA	ID				
0.269	J19YB9/ J19YD0				
0.252	J19YB8				
0.271	J19YC0	Number of samples		Uncensored values	
0.276	J19YC1	Uncensored	12	Mean	0.243
0.233	J19YC2	Censored		Lognormal mean	0.246
0.321	J19YC3	Detection limit or PQL		Std. devn.	0.062
0.260	J19YC4	Method detection limit		Median	0.256
0.252	J19YC5	TOTAL	12	Min.	0.115
0.125	J1FKL4			Max.	0.321
0.250	J19YC7				
0.115	J1FKL5				
0.298	J19YC9				

Lognormal distribution? r-squared is: 0.713
Normal distribution? r-squared is: 0.803
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.273

Nickel 95% UCL Calculation

DATA	ID				
13.9	J19YB9/ J19YD0				
8.94	J19YB8				
10.9	J19YC0	Number of samples		Uncensored values	
9.84	J19YC1	Uncensored	12	Mean	10.8
10.0	J19YC2	Censored		Lognormal mean	10.8
10.8	J19YC3	Detection limit or PQL		Std. devn.	1.36
10.0	J19YC4	Method detection limit		Median	10.5
10.2	J19YC5	TOTAL	12	Min.	8.94
11.1	J1FKL4			Max.	13.9
9.63	J19YC7				
11.5	J1FKL5				
12.5	J19YC9				

Lognormal distribution? r-squared is: 0.940
Normal distribution? r-squared is: 0.909
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.5

Vanadium 95% UCL Calculation

DATA	ID				
48.2	J19YB9/ J19YD0				
42.9	J19YB8				
47.0	J19YC0	Number of samples		Uncensored values	
46.8	J19YC1	Uncensored	12	Mean	46.7
46.1	J19YC2	Censored		Lognormal mean	46.7
52.8	J19YC3	Detection limit or PQL		Std. devn.	2.74
49.4	J19YC4	Method detection limit		Median	46.7
45.2	J19YC5	TOTAL	12	Min.	42.6
42.6	J1FKL4			Max.	52.8
45.4	J19YC7				
47.4	J1FKL5				
46.6	J19YC9				

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.934
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 48.2

Zinc 95% UCL Calculation

DATA	ID				
35.9	J19YB9/ J19YD0				
29.0	J19YB8				
68.7	J19YC0	Number of samples		Uncensored values	
38.0	J19YC1	Uncensored	12	Mean	40.8
33.4	J19YC2	Censored		Lognormal mean	40.7
39.2	J19YC3	Detection limit or PQL		Std. devn.	13.5
35.8	J19YC4	Method detection limit		Median	35.7
69.8	J19YC5	TOTAL	12	Min.	29.0
35.2	J1FKL4			Max.	69.8
34.8	J19YC7				
34.3	J1FKL5				
35.5	J19YC9				

Lognormal distribution? r-squared is: 0.698
Normal distribution? r-squared is: 0.630
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 47.2

Benzo(a)anthracene 95% UCL Calculation

DATA	ID				
1.40	J19YB9/ J19YD0				
1.05	J19YB8				
4.71	J19YC0	Number of samples		Uncensored values	
7.32	J19YC1	Uncensored	12	Mean	7.88
8.99	J19YC2	Censored		Lognormal mean	8.80
3.11	J19YC3	Detection limit or PQL		Std. devn.	6.50
11.2	J19YC4	Method detection limit		Median	6.96
6.59	J19YC5	TOTAL	12	Min.	1.05
10.0	J1FKL4			Max.	23.0
15.5	J19YC7				
23.0	J1FKL5				
1.70	J19YC9				

Lognormal distribution? r-squared is: 0.959
Normal distribution? r-squared is: 0.898
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 20.8

Benzo(a)pyrene 95% UCL Calculation

DATA	ID				
1.57	J19YB9/ J19YD0				
1.76	J19YB8				
5.05	J19YC0	Number of samples		Uncensored values	
6.97	J19YC1	Uncensored	12	Mean	7.82
8.99	J19YC2	Censored		Lognormal mean	8.71
3.98	J19YC3	Detection limit or PQL		Std. devn.	5.52
11.4	J19YC4	Method detection limit		Median	7.56
8.15	J19YC5	TOTAL	12	Min.	1.19
11.0	J1FKL4			Max.	18.0
15.8	J19YC7				
18.0	J1FKL5				
1.19	J19YC9				

Lognormal distribution? r-squared is: 0.929
Normal distribution? r-squared is: 0.952
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.8

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID				
1.35	J19YB9/ J19YD0				
0.88	J19YB8				
6.73	J19YC0	Number of samples		Uncensored values	
11.3	J19YC1	Uncensored	12	Mean	10.0
9.17	J19YC2	Censored		Lognormal mean	12.3
7.95	J19YC3	Detection limit or PQL		Std. devn.	7.79
18.4	J19YC4	Method detection limit		Median	8.56
12.0	J19YC5	TOTAL	12	Min.	0.88
5.70	J1FKL4			Max.	24.9
24.9	J19YC7				
20.0	J1FKL5				
1.19	J19YC9				

Lognormal distribution? r-squared is: 0.893
Normal distribution? r-squared is: 0.938
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 14.0

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID				
1.48	J19YB9/ J19YD0				
1.76	J19YB8				
3.87	J19YC0	Number of samples		Uncensored values	
1.74	J19YC1	Uncensored	12	Mean	5.91
6.52	J19YC2	Censored		Lognormal mean	5.88
3.63	J19YC3	Detection limit or PQL		Std. devn.	6.23
10.1	J19YC4	Method detection limit		Median	3.72
9.36	J19YC5	TOTAL	12	Min.	1.48
3.80	J1FKL4			Max.	23.4
23.4	J19YC7				
3.60	J1FKL5				
1.70	J19YC9				

Lognormal distribution? r-squared is: 0.922
Normal distribution? r-squared is: 0.689
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.7

Washington Closure Hanford — CALCULATION SHEET

Originator	J. D. Skoglie	Date	05/17/11
Project	100-H Field Remediation	Job No.	14655
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations		
Calc. No.	0100H-CA-V0164	Rev. No.	0
Checked	T. E. Queen	Date	05/17/11
		Sheet No.	32 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Shallow Zone

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.76	J19YB8
2.52	J19YC0
3.49	J19YC1
3.88	J19YC2
1.73	J19YC3
5.77	J19YC4
3.99	J19YC5
5.80	J1FKL4
8.59	J19YC7
10.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	4.25
Censored		Lognormal mean	4.32
Detection limit or PQL		Std. devn.	2.79
Method detection limit		Median	3.69
TOTAL	12	Min.	1.70
		Max.	10.0

Lognormal distribution? r-squared is: 0.929
Normal distribution? r-squared is: 0.867
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.75

Chrysene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.05	J19YB8
5.38	J19YC0
8.37	J19YC1
11.5	J19YC2
2.94	J19YC3
16.4	J19YC4
4.68	J19YC5
10.0	J1FKL4
12.2	J19YC7
18.0	J1FKL5
0.85	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.77
Censored		Lognormal mean	9.08
Detection limit or PQL		Std. devn.	5.92
Method detection limit		Median	6.88
TOTAL	12	Min.	0.85
		Max.	18.0

Lognormal distribution? r-squared is: 0.932
Normal distribution? r-squared is: 0.944
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 23.6

Fluoranthene 95% UCL Calculation

DATA	ID
2.25	J19YB9/ J19YD0
2.46	J19YB8
21.4	J19YC0
19.9	J19YC1
31.2	J19YC2
9.34	J19YC3
27.1	J19YC4
25.0	J19YC5
7.00	J1FKL4
38.5	J19YC7
48.0	J1FKL5
3.06	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	19.6
Censored		Lognormal mean	23.5
Detection limit or PQL		Std. devn.	15.1
Method detection limit		Median	20.7
TOTAL	12	Min.	2.25
		Max.	48.0

Lognormal distribution? r-squared is: 0.900
Normal distribution? r-squared is: 0.942
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 66.6

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.76	J19YB8
4.54	J19YC0
7.15	J19YC1
6.70	J19YC2
5.01	J19YC3
9.97	J19YC4
8.32	J19YC5
6.50	J1FKL4
16.8	J19YC7
14.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.02
Censored		Lognormal mean	7.46
Detection limit or PQL		Std. devn.	4.75
Method detection limit		Median	6.60
TOTAL	12	Min.	1.70
		Max.	16.8

Lognormal distribution? r-squared is: 0.926
Normal distribution? r-squared is: 0.920
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.6

Phenanthrene 95% UCL Calculation

DATA	ID
1.18	J19YB9/ J19YD0
1.58	J19YB8
7.57	J19YC0
5.93	J19YC1
11.6	J19YC2
3.98	J19YC3
10.5	J19YC4
9.88	J19YC5
6.50	J1FKL4
10.8	J19YC7
31.0	J1FKL5
1.53	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	8.50
Censored		Lognormal mean	9.30
Detection limit or PQL		Std. devn.	8.03
Method detection limit		Median	7.04
TOTAL	12	Min.	1.18
		Max.	31.0

Lognormal distribution? r-squared is: 0.926
Normal distribution? r-squared is: 0.743
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 21.7

Pyrene 95% UCL Calculation

DATA	ID
1.83	J19YB9/ J19YD0
1.23	J19YB8
14.5	J19YC0
17.3	J19YC1
23.1	J19YC2
6.40	J19YC3
29.4	J19YC4
16.5	J19YC5
48.0	J1FKL4
3.06	J19YC7
47.0	J1FKL5
1.70	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	17.7
Censored		Lognormal mean	23.3
Detection limit or PQL		Std. devn.	14.8
Method detection limit		Median	15.5
TOTAL	12	Min.	1.23
		Max.	47.0

Lognormal distribution? r-squared is: 0.892
Normal distribution? r-squared is: 0.924
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 25.4

Fluoride 95% UCL Calculation

DATA	ID
0.8	J19YB9/ J19YD0
0.5	J19YB8
0.7	J19YC0
0.8	J19YC1
0.4	J19YC2
0.4	J19YC3
0.9	J19YC4
0.9	J19YC5
1.5	J1FKL4
0.5	J19YC7
0.4	J1FKL5
1.2	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.7
Censored		Lognormal mean	0.7
Detection limit or PQL		Std. devn.	0.3
Method detection limit		Median	0.7
TOTAL	12	Min.	0.4
		Max.	1.5

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.896
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.98

Nitrogen in nitrate 95% UCL Calculation

DATA	ID
0.7	J19YB9/ J19YD0
0.8	J19YB8
0.2	J19YC0
1.1	J19YC1
1.8	J19YC2
1.9	J19YC3
0.7	J19YC4
3.4	J19YC5
1.1	J1FKL4
2.1	J19YC7
0.4	J1FKL5
0.8	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	1.2
Censored		Lognormal mean	1.3
Detection limit or PQL		Std. devn.	0.9
Method detection limit		Median	0.9
TOTAL	12	Min.	0.2
		Max.	3.4

Lognormal distribution? r-squared is: 0.949
Normal distribution? r-squared is: 0.878
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.44

Nitrogen in nitrate and nitrite 95% UCL Calculation

DATA	ID
0.6	J19YB9/ J19YD0
1.4	J19YB8
0.2	J19YC0
0.7	J19YC1
1.2	J19YC2
1.0	J19YC3
0.7	J19YC4
2.4	J19YC5
0.5	J1FKL4
1.7	J19YC7
0.2	J1FKL5
0.5	J19YC9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.9
Censored		Lognormal mean	1.0
Detection limit or PQL		Std. devn.	0.7
Method detection limit		Median	0.7
TOTAL	12	Min.	0.2
		Max.	2.4

Lognormal distribution? r-squared is: 0.947
Normal distribution? r-squared is: 0.904
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.9

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	**Date**	05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project	100-H Field Remediation	**Job No.**	14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations				**Sheet No.** 33 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Shallow Zone

DATA	ID	Sulfate 95% UCL Calculation			
2.9	J19YB9/ J19YD0				
3.2	J19YB8				
1.9	J19YC0	Number of samples		Uncensored values	
4.6	J19YC1	Uncensored	12	Mean	5.7
5.4	J19YC2	Censored		Lognormal mean	5.8
10	J19YC3	etection limit or PQL		Std. devn.	3.8
6.2	J19YC4	lethod detection limit		Median	5.0
14	J19YC5	TOTAL	12	Min.	1.9
5.8	J1FKL4			Max.	14
9.3	J19YC7				
2.1	J1FKL5				
2.6	J19YC9				
		Lognormal distribution?		Normal distribution?	
		r-squared is: 0.973		r-squared is: 0.880	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is		9.2	

DATA	ID	TPH-motor oil (high boiling) 95% UCL Calculation			
5425	J19YB9/ J19YD0				
5250	J19YB8				
27600	J19YC0	Number of samples		Uncensored values	
4760	J19YC1	Uncensored	12	Mean	8944
5300	J19YC2	Censored		Lognormal mean	8443
4330	J19YC3	etection limit or PQL		Std. devn.	9284
4900	J19YC4	lethod detection limit		Median	5175
3850	J19YC5	TOTAL	12	Min.	385n
29900	J19YC6			Max.	29900
4620	J19YC7				
6290	J19YC8				
5100	J19YC9				
		Lognormal distribution?		Normal distribution?	
		r-squared is: 0.630		r-squared i 0.528	
		Recommendations:			
		Reject BOTH lognormal and normal distributions			
		UCL (based on Z-statistic) is		13352	

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

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Checked T. E. Queen

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Sheet No. 34 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Deep Zone

Arsenic 95% UCL Calculation

DATA	ID				
6.4	J1HH85/ J1HH86				
7.0	J1HH80				
2.5	J1HH81	Number of samples		Uncensored values	
1.9	J1HH82	Uncensored	12	Mean	4.0
4.8	J1HH83	Censored		Lognormal mean	4.1
9.8	J1FKK5	Detection limit or PQL		Std. devn.	2.6
1.8	J1FKK6	Method detection limit		Median	3.0
4.2	J1HH84	TOTAL	12	Min.	1.1
1.1	J1FKK9			Max.	9.8
2.4	J1FKL0				
2.8	J1FKL1				
3.2	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.986 r-squared is: 0.890
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.3

Barium 95% UCL Calculation

DATA	ID				
42.8	J1HH85/ J1HH86				
60.9	J1HH80				
57.7	J1HH81	Number of samples		Uncensored values	
59.7	J1HH82	Uncensored	12	Mean	58.6
68.3	J1HH83	Censored		Lognormal mean	58.9
35.5	J1FKK5	Detection limit or PQL		Std. devn.	16.5
50.3	J1FKK6	Method detection limit		Median	58.7
34.7	J1HH84	TOTAL	12	Min.	34.7
77.1	J1FKK9			Max.	90.3
57.4	J1FKL0				
69.0	J1FKL1				
90.3	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.958 r-squared is: 0.970
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 69.8

Beryllium 95% UCL Calculation

DATA	ID				
0.125	J1HH85/ J1HH86				
0.130	J1HH80				
0.063	J1HH81	Number of samples		Uncensored values	
0.042	J1HH82	Uncensored	12	Mean	0.064
0.160	J1HH83	Censored		Lognormal mean	0.070
0.016	J1FKK5	Detection limit or PQL		Std. devn.	0.053
0.015	J1FKK6	Method detection limit		Median	0.053
0.098	J1HH84	TOTAL	12	Min.	0.015
0.016	J1FKK9			Max.	0.160
0.017	J1FKL0				
0.074	J1FKL1				
0.017	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.870 r-squared is: 0.878
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.089

Cadmium 95% UCL Calculation

DATA	ID				
0.165	J1HH85/ J1HH86				
0.067	J1HH80				
0.046	J1HH81	Number of samples		Uncensored values	
0.042	J1HH82	Uncensored	12	Mean	0.054
0.081	J1HH83	Censored		Lognormal mean	0.055
0.020	J1FKK5	Detection limit or PQL		Std. devn.	0.041
0.052	J1FKK6	Method detection limit		Median	0.049
0.055	J1HH84	TOTAL	12	Min.	0.020
0.020	J1FKK9			Max.	0.165
0.021	J1FKL0				
0.021	J1FKL1				
0.064	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.917 r-squared is: 0.769
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.089

Chromium 95% UCL Calculation

DATA	ID				
14.0	J1HH85/ J1HH86				
9.80	J1HH80				
6.20	J1HH81	Number of samples		Uncensored values	
15.1	J1HH82	Uncensored	12	Mean	9.72
12.9	J1HH83	Censored		Lognormal mean	9.75
7.60	J1FKK5	Detection limit or PQL		Std. devn.	2.98
7.20	J1FKK6	Method detection limit		Median	8.75
8.80	J1HH84	TOTAL	12	Min.	6.20
6.50	J1FKK9			Max.	15.1
8.70	J1FKL0				
11.6	J1FKL1				
8.30	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.963 r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.6

Cobalt 95% UCL Calculation

DATA	ID				
5.4	J1HH85/ J1HH86				
6.2	J1HH80				
6.4	J1HH81	Number of samples		Uncensored values	
6.6	J1HH82	Uncensored	12	Mean	5.9
6.3	J1HH83	Censored		Lognormal mean	5.9
5.1	J1FKK5	Detection limit or PQL		Std. devn.	0.6
5.5	J1FKK6	Method detection limit		Median	6.0
4.7	J1HH84	TOTAL	12	Min.	4.7
5.5	J1FKK9			Max.	6.7
5.7	J1FKL0				
6.4	J1FKL1				
6.7	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.936 r-squared is: 0.944
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.2

Copper 95% UCL Calculation

DATA	ID				
17.4	J1HH85/ J1HH86				
14.0	J1HH80				
15.3	J1HH81	Number of samples		Uncensored values	
13.4	J1HH82	Uncensored	12	Mean	14.4
14.4	J1HH83	Censored		Lognormal mean	14.4
12.8	J1FKK5	Detection limit or PQL		Std. devn.	1.63
15.4	J1FKK6	Method detection limit		Median	14.2
11.7	J1HH84	TOTAL	12	Min.	11.7
12.7	J1FKK9			Max.	17.4
13.6	J1FKL0				
15.9	J1FKL1				
15.8	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.982 r-squared is: 0.980
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 15.3

Lead 95% UCL Calculation

DATA	ID				
15.8	J1HH85/ J1HH86				
18.5	J1HH80				
4.20	J1HH81	Number of samples		Uncensored values	
2.90	J1HH82	Uncensored	12	Mean	11.0
11.4	J1HH83	Censored		Lognormal mean	11.2
31.3	J1FKK5	Detection limit or PQL		Std. devn.	7.98
8.40	J1FKK6	Method detection limit		Median	9.10
11.3	J1HH84	TOTAL	12	Min.	2.90
3.50	J1FKK9			Max.	31.3
6.00	J1FKL0				
8.40	J1FKL1				
9.80	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.980 r-squared is: 0.842
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18.7

Manganese 95% UCL Calculation

DATA	ID				
225	J1HH85/ J1HH86				
283	J1HH80				
252	J1HH81	Number of samples		Uncensored values	
231	J1HH82	Uncensored	12	Mean	240
261	J1HH83	Censored		Lognormal mean	240
209	J1FKK5	Detection limit or PQL		Std. devn.	27.4
217	J1FKK6	Method detection limit		Median	231
206	J1HH84	TOTAL	12	Min.	206
219	J1FKK9			Max.	284
230	J1FKL0				
260	J1FKL1				
284	J1FKL2				

Lognormal distribution? Normal distribution?
r-squared is: 0.940 r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 255

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Ecology Software (MTCAStat) Results, 116-H-5 Deep Zone

Nickel 95% UCL Calculation

DATA	ID
10.6	J1HH85/ J1HH86
10.6	J1HH80
8.10	J1HH81
12.8	J1HH82
11.5	J1HH83
10.1	J1FKK5
9.20	J1FKK6
12.2	J1HH84
6.80	J1FKK9
9.20	J1FKL0
13.5	J1FKL1
11.3	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	10.5
Censored		Lognormal mean	10.5
Detection limit or PQL		Std. devn.	1.95
Method detection limit		Median	10.6
TOTAL	12	Min.	6.80
		Max.	13.5

Lognormal distribution? Normal distribution?
r-squared is: 0.956 r-squared is: 0.985
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.7

Vanadium 95% UCL Calculation

DATA	ID
36.5	J1HH85/ J1HH86
40.3	J1HH80
48.7	J1HH81
56.4	J1HH82
41.9	J1HH83
33.6	J1FKK5
39.4	J1FKK6
30.5	J1HH84
47.9	J1FKK9
35.4	J1FKL0
40.9	J1FKL1
54.7	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	42.2
Censored		Lognormal mean	42.2
Detection limit or PQL		Std. devn.	8.18
Method detection limit		Median	40.6
TOTAL	12	Min.	30.5
		Max.	56.4

Lognormal distribution? Normal distribution?
r-squared is: 0.976 r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 47.0

Zinc 95% UCL Calculation

DATA	ID
69.0	J1HH85/ J1HH86
39.0	J1HH80
35.5	J1HH81
34.4	J1HH82
38.9	J1HH83
27.4	J1FKK5
31.6	J1FKK6
29.6	J1HH84
30.9	J1FKK9
31.3	J1FKL0
44.7	J1FKL1
46.2	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	38.2
Censored		Lognormal mean	38.2
Detection limit or PQL		Std. devn.	11.3
Method detection limit		Median	35.0
TOTAL	12	Min.	27.4
		Max.	69.0

Lognormal distribution? Normal distribution?
r-squared is: 0.879 r-squared is: 0.775
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 43.6

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
76	J1HH85/ J1HH86
94	J1HH80
80	J1HH81
72	J1HH82
89	J1HH83
24	J1FKK5
24	J1FKK6
78	J1HH84
23	J1FKK9
24	J1FKL0
26	J1FKL1
24	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	53
Censored		Lognormal mean	54
Detection limit or PQL		Std. devn.	31
Method detection limit		Median	49
TOTAL	12	Min.	23
		Max.	94

Lognormal distribution? Normal distribution?
r-squared is: 0.769 r-squared is: 0.794
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 67

Fluoride 95% UCL Calculation

DATA	ID
1.1	J1HH85/ J1HH86
0.6	J1HH80
0.7	J1HH81
0.9	J1HH82
1.7	J1HH83
1.0	J1FKK5
1.3	J1FKK6
0.6	J1HH84
0.3	J1FKK9
0.4	J1FKL0
1.1	J1FKL1
1.1	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	0.9
Censored		Lognormal mean	0.9
Detection limit or PQL		Std. devn.	0.4
Method detection limit		Median	1.0
TOTAL	12	Min.	0.3
		Max.	1.7

Lognormal distribution? Normal distribution?
r-squared is: 0.948 r-squared is: 0.965
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.3

Nitrogen in nitrate 95% UCL Calculation

DATA	ID
2.71	J1HH85/ J1HH86
1.02	J1HH80
55.8	J1HH81
26.7	J1HH82
2.26	J1HH83
7.59	J1FKK5
5.38	J1FKK6
1.13	J1HH84
0.79	J1FKK9
3.19	J1FKL0
4.02	J1FKL1
5.11	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	9.64
Censored		Lognormal mean	9.16
Detection limit or PQL		Std. devn.	16.1
Method detection limit		Median	3.60
TOTAL	12	Min.	0.79
		Max.	55.8

Lognormal distribution? Normal distribution?
r-squared is: 0.935 r-squared is: 0.563
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 34.0

Nitrogen in nitrate and nitrite 95% UCL Calculation

DATA	ID
1.66	J1HH85/ J1HH86
0.66	J1HH80
43.4	J1HH81
22.7	J1HH82
1.40	J1HH83
5.36	J1FKK5
5.67	J1FKK6
0.79	J1HH84
0.63	J1FKK9
2.08	J1FKL0
2.94	J1FKL1
4.37	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	7.64
Censored		Lognormal mean	7.43
Detection limit or PQL		Std. devn.	12.8
Method detection limit		Median	2.51
TOTAL	12	Min.	0.63
		Max.	43.4

Lognormal distribution? Normal distribution?
r-squared is: 0.935 r-squared is: 0.579
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 31.3

Sulfate 95% UCL Calculation

DATA	ID
8	J1HH85/ J1HH86
5	J1HH80
160	J1HH81
101	J1HH82
8	J1HH83
18	J1FKK5
19	J1FKK6
10	J1HH84
6	J1FKK9
11	J1FKL0
19	J1FKL1
25	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	33
Censored		Lognormal mean	30
Detection limit or PQL		Std. devn.	48
Method detection limit		Median	14
TOTAL	12	Min.	5
		Max.	160

Lognormal distribution? Normal distribution?
r-squared is: 0.882 r-squared is: 0.588
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 55.2

TPH-motor oil (high boiling) 95% UCL Calculation

DATA	ID
4575	J1HH85/ J1HH86
5200	J1HH80
5300	J1HH81
5150	J1HH82
9290	J1HH83
5250	J1FKK5
127000	J1FKK6
4230	J1HH84
18700	J1FKK9
6750	J1FKL0
6760	J1FKL1
8670	J1FKL2

Number of samples		Uncensored values	
Uncensored	12	Mean	17240
Censored		Lognormal mean	13175
Detection limit or PQL		Std. devn.	34789
Method detection limit		Median	6025
TOTAL	12	Min.	4230
		Max.	127000

Lognormal distribution? Normal distribution?
r-squared is: 0.653 r-squared is: 0.376
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 33760

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	Date	05/17/11	Calc. No.	0100H-CA-V0164
Project	100-H Field Remediation	Job No.	14655	Checked	T. E. Queen
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations	Rev. No.	0	Date	05/17/11
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Ecology Software (MTCAStat) Results, 116-H-5 Overburden

Antimony 95% UCL Calculation

DATA	ID
0.366	J19YF8/ J19YH6
0.377	J19YF4
0.437	J19YF5
0.464	J19YF6
0.272	J19YF7
0.426	J19YF9
0.279	J19YH0
0.185	J1FKL6
0.387	J19YH2
0.309	J19YH3
0.491	J19YH4
0.469	J19YH5
0.254	J1B4H9
0.386	J1B4J0
0.274	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	0.358
Censored		Lognormal mean	0.360
Detection limit or PQL		Std. devn.	0.092
Method detection limit		Median	0.377
TOTAL	12	Min.	0.185
		Max.	0.491

Lognormal distribution? r-squared is: 0.930
Normal distribution? r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.414

Arsenic 95% UCL Calculation

DATA	ID
4.85	J19YF8/ J19YH6
3.27	J19YF4
4.17	J19YF5
6.21	J19YF6
3.96	J19YF7
8.14	J19YF9
5.13	J19YH0
6.50	J1FKL6
3.59	J19YH2
4.77	J19YH3
6.82	J19YH4
5.29	J19YH5
4.23	J1B4H9
4.75	J1B4J0
6.10	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	5.19
Censored		Lognormal mean	5.20
Detection limit or PQL		Std. devn.	1.34
Method detection limit		Median	4.85
TOTAL	12	Min.	3.27
		Max.	8.14

Lognormal distribution? r-squared is: 0.987
Normal distribution? r-squared is: 0.959
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.89

Barium 95% UCL Calculation

DATA	ID
49.3	J19YF8/ J19YH6
50.9	J19YF4
51.8	J19YF5
47.8	J19YF6
48.5	J19YF7
54.4	J19YF9
43.1	J19YH0
49.8	J1FKL6
48.7	J19YH2
37.8	J19YH3
67.6	J19YH4
46.4	J19YH5
57.1	J1B4H9
46.2	J1B4J0
57.4	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	50.5
Censored		Lognormal mean	50.5
Detection limit or PQL		Std. devn.	6.91
Method detection limit		Median	49.3
TOTAL	12	Min.	37.8
		Max.	67.6

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.922
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 53.8

Beryllium 95% UCL Calculation

DATA	ID
0.156	J19YF8/ J19YH6
0.153	J19YF4
0.161	J19YF5
0.169	J19YF6
0.162	J19YF7
0.197	J19YF9
0.149	J19YH0
0.120	J1FKL6
0.136	J19YH2
0.140	J19YH3
0.208	J19YH4
0.175	J19YH5
0.181	J1B4H9
0.147	J1B4J0
0.181	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	0.162
Censored		Lognormal mean	0.162
Detection limit or PQL		Std. devn.	0.023
Method detection limit		Median	0.161
TOTAL	12	Min.	0.120
		Max.	0.208

Lognormal distribution? r-squared is: 0.990
Normal distribution? r-squared is: 0.987
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.174

Boron 95% UCL Calculation

DATA	ID
0.89	J19YF8/ J19YH6
0.85	J19YF4
0.96	J19YF5
0.92	J19YF6
0.90	J19YF7
1.17	J19YF9
0.81	J19YH0
1.30	J1FKL6
0.75	J19YH2
0.84	J19YH3
1.34	J19YH4
1.15	J19YH5
2.55	J1B4H9
1.70	J1B4J0
2.02	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	1.21
Censored		Lognormal mean	1.21
Detection limit or PQL		Std. devn.	0.51
Method detection limit		Median	0.96
TOTAL	12	Min.	0.75
		Max.	2.55

Lognormal distribution? r-squared is: 0.890
Normal distribution? r-squared is: 0.796
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.43

Cadmium 95% UCL Calculation

DATA	ID
0.110	J19YF8/ J19YH6
0.090	J19YF4
0.054	J19YF5
0.107	J19YF6
0.105	J19YF7
0.070	J19YF9
0.084	J19YH0
0.064	J1FKL6
0.097	J19YH2
0.117	J19YH3
0.064	J19YH4
0.039	J19YH5
0.068	J1B4H9
0.042	J1B4J0
0.057	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	0.078
Censored		Lognormal mean	0.078
Detection limit or PQL		Std. devn.	0.025
Method detection limit		Median	0.070
TOTAL	12	Min.	0.039
		Max.	0.117

Lognormal distribution? r-squared is: 0.954
Normal distribution? r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.094

Chromium 95% UCL Calculation

DATA	ID
10.3	J19YF8/ J19YH6
13.2	J19YF4
11.4	J19YF5
10.7	J19YF6
11.7	J19YF7
11.7	J19YF9
9.84	J19YH0
10.6	J1FKL6
9.58	J19YH2
9.93	J19YH3
12.8	J19YH4
11.7	J19YH5
10.3	J1B4H9
11.0	J1B4J0
11.1	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	11.1
Censored		Lognormal mean	11.1
Detection limit or PQL		Std. devn.	1.05
Method detection limit		Median	11.0
TOTAL	12	Min.	9.58
		Max.	13.2

Lognormal distribution? r-squared is: 0.969
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.5

Cobalt 95% UCL Calculation

DATA	ID
5.29	J19YF8/ J19YH6
5.37	J19YF4
5.34	J19YF5
5.52	J19YF6
5.15	J19YF7
5.80	J19YF9
4.93	J19YH0
6.10	J1FKL6
4.95	J19YH2
5.27	J19YH3
5.9	J19YH4
5.39	J19YH5
5.36	J1B4H9
4.92	J1B4J0
5.90	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	5.41
Censored		Lognormal mean	5.41
Detection limit or PQL		Std. devn.	0.37
Method detection limit		Median	5.36
TOTAL	12	Min.	4.92
		Max.	6.10

Lognormal distribution? r-squared is: 0.946
Normal distribution? r-squared is: 0.941
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.58

Copper 95% UCL Calculation

DATA	ID
12.7	J19YF8/ J19YH6
13.5	J19YF4
14.3	J19YF5
13.5	J19YF6
13.8	J19YF7
13.2	J19YF9
13.4	J19YH0
13.6	J1FKL6
11.7	J19YH2
12.4	J19YH3
14.5	J19YH4
13.4	J19YH5
12.9	J1B4H9
12.2	J1B4J0
13.6	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	13.2
Censored		Lognormal mean	13.2
Detection limit or PQL		Std. devn.	0.76
Method detection limit		Median	13.4
TOTAL	12	Min.	11.7
		Max.	14.5

Lognormal distribution? r-squared is: 0.953
Normal distribution? r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.6

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	Date	05/17/11
Project	100-H Field Remediation	Job No.	14655
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations		
Calc. No.	0100H-CA-V0164	Rev. No.	0
Checked	T. E. Queen	Date	05/17/11
		Sheet No.	37 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Overburden

Hexavalent chromium 95% UCL Calculation

DATA	ID				
0.13	J19YF8/ J19YH6				
0.15	J19YF4				
0.11	J19YF5	Number of samples		Uncensored values	
0.18	J19YF6	Uncensored	12	Mean	0.14
0.15	J19YF7	Censored		Lognormal mean	0.14
0.14	J19YF9	Detection limit or PQL		Std. devn.	0.03
0.20	J19YH0	Method detection limit		Median	0.14
0.18	J1FKL6	TOTAL	12	Min.	0.10
0.12	J19YH2			Max.	0.20
0.17	J19YH3				
0.15	J19YH4				
0.11	J19YH5				
0.10	J1B4H9				
0.10	J1B4J0	Lognormal distribution?		Normal distribution?	
0.10	J1B4J1	r-squared is: 0.947		r-squared is: 0.942	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	0.16		

Lead 95% UCL Calculation

DATA	ID				
13.1	J19YF8/ J19YH6				
7.0	J19YF4				
10.3	J19YF5	Number of samples		Uncensored values	
17.6	J19YF6	Uncensored	12	Mean	13.9
7.4	J19YF7	Censored		Lognormal mean	14.0
25.2	J19YF9	Detection limit or PQL		Std. devn.	5.26
16.8	J19YH0	Method detection limit		Median	13.1
17.9	J1FKL6	TOTAL	12	Min.	6.95
8.9	J19YH2			Max.	25.2
11.3	J19YH3				
22.4	J19YH4				
14.0	J19YH5				
10.5	J1B4H9				
12.3	J1B4J0	Lognormal distribution?		Normal distribution?	
14.3	J1B4J1	r-squared is: 0.989		r-squared is: 0.951	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	17.0		

Manganese 95% UCL Calculation

DATA	ID				
246	J19YF8/ J19YH6				
266	J19YF4				
259	J19YF5	Number of samples		Uncensored values	
251	J19YF6	Uncensored	12	Mean	250
256	J19YF7	Censored		Lognormal mean	250
272	J19YF9	Detection limit or PQL		Std. devn.	17
220	J19YH0	Method detection limit		Median	251
253	J1FKL6	TOTAL	12	Min.	220
224	J19YH2			Max.	276
244	J19YH3				
276	J19YH4				
248	J19YH5				
250	J1B4H9				
227	J1B4J0	Lognormal distribution?		Normal distribution?	
262	J1B4J1	r-squared is: 0.950		r-squared is. 0.960	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	258		

Molybdenum 95% UCL Calculation

DATA	ID				
0.338	J19YF8/ J19YH6				
0.250	J19YF4				
0.352	J19YF5	Number of samples		Uncensored values	
0.232	J19YF6	Uncensored	12	Mean	0.268
0.276	J19YF7	Censored		Lognormal mean	0.270
0.313	J19YF9	Detection limit or PQL		Std. devn.	0.084
0.227	J19YH0	Method detection limit		Median	0.272
0.125	J1FKL6	TOTAL	12	Min.	0.125
0.167	J19YH2			Max.	0.467
0.467	J19YH3				
0.199	J19YH4				
0.209	J19YH5				
0.272	J1B4H9				
0.308	J1B4J0	Lognormal distribution?		Normal distribution?	
0.289	J1B4J1	r-squared is: 0.989		r-squared is: 0.961	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	0.318		

Nickel 95% UCL Calculation

DATA	ID				
10.9	J19YF8/ J19YH6				
10.9	J19YF4				
11.0	J19YF5	Number of samples		Uncensored values	
10.1	J19YF6	Uncensored	12	Mean	10.3
10.5	J19YF7	Censored		Lognormal mean	10.3
9.82	J19YF9	Detection limit or PQL		Std. devn.	0.99
9.49	J19YH0	Method detection limit		Median	10.3
10.3	J1FKL6	TOTAL	12	Min.	8.89
8.89	J19YH2			Max.	11.9
9.11	J19YH3				
11.6	J19YH4				
11.9	J19YH5				
9.50	J1B4H9				
9.29	J1B4J0	Lognormal distribution?		Normal distribution?	
11.8	J1B4J1	r-squared is: 0.969		r-squared is: 0.986	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	10.8		

Vanadium 95% UCL Calculation

DATA	ID				
41.0	J19YF8/ J19YH6				
41.7	J19YF4				
46.4	J19YF5	Number of samples		Uncensored values	
46.3	J19YF6	Uncensored	12	Mean	43.2
43.8	J19YF7	Censored		Lognormal mean	43.3
46.5	J19YF9	Detection limit or PQL		Std. devn.	2.48
38.8	J19YH0	Method detection limit		Median	43.6
42.1	J1FKL6	TOTAL	12	Min	38.8
41.5	J19YH2			Max.	46.5
39.4	J19YH3				
45.5	J19YH4				
44.8	J19YH5				
45.1	J1B4H9				
42.1	J1B4J0	Lognormal distribution?		Normal distribution?	
44.9	J1B4J1	r-squared is: 0.939		r-squared is: 0.943	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	44.4		

Zinc 95% UCL Calculation

DATA	ID				
31.7	J19YF8/ J19YH6				
32.8	J19YF4				
41.2	J19YF5	Number of samples		Uncensored values	
33.3	J19YF6	Uncensored	12	Mean	38.9
33.2	J19YF7	Censored		Lognormal mean	38.9
39.0	J19YF9	Detection limit or PQL		Std. devn.	9.34
55.3	J19YH0	Method detection limit		Median	34.3
34.3	J1FKL6	TOTAL	12	Min.	29.4
30.1	J19YH2			Max.	59.6
29.4	J19YH3				
44.4	J19YH4				
33.1	J19YH5				
59.6	J1B4H9				
37.0	J1B4J0	Lognormal distribution?		Normal distribution?	
49.4	J1B4J1	r-squared is: 0.901		r-squared is: 0.857	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	43.4		

Benzo(a)anthracene 95% UCL Calculation

DATA	ID				
4.98	J19YF8/ J19YH6				
1.68	J19YF4				
1.63	J19YF5	Number of samples		Uncensored values	
0.97	J19YF6	Uncensored	12	Mean	18.0
0.92	J19YF7	Censored		Lognormal mean	21.5
4.65	J19YF9	Detection limit or PQL		Std. devn.	25.3
55.5	J19YH0	Method detection limit		Median	10.2
18.0	J1FKL6	TOTAL	12	Min.	0.92
94.5	J19YH2			Max.	94.5
13.3	J19YH3				
21.3	J19YH4				
13.7	J19YH5				
10.2	J1B4H9				
6.98	J1B4J0	Lognormal distribution?		Normal distribution?	
22.3	J1B4J1	r-squared is: 0.968		r-squared is: 0.660	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	78.5		

Benzo(a)pyrene 95% UCL Calculation

DATA	ID				
5.82	J19YF8/ J19YH6				
1.68	J19YF4				
1.24	J19YF5	Number of samples		Uncensored values	
1.70	J19YF6	Uncensored	12	Mean	20.3
1.44	J19YF7	Censored		Lognormal mean	23.3
7.63	J19YF9	Detection limit or PQL		Std. devn.	27.1
68.8	J19YH0	Method detection limit		Median	7.63
17.0	J1FKL6	TOTAL	12	Min	1.24
85.3	J19YH2			Max.	85.3
11.9	J19YH3				
57.4	J19YH4				
12.8	J19YH5				
7.41	J1B4H9				
5.72	J1B4J0	Lognormal distribution?		Normal distribution?	
18.9	J1B4J1	r-squared is: 0.950		r-squared is: 0.706	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	83.1		

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	**Date**	05/17/11	**Calc. No.**	0100H-CA-V0164
Project	100-H Field Remediation	**Job No.**	14655	**Checked**	T. E. Queen
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Rev. No.**	0
				Date	05/17/11
				Sheet No.	38 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Overburden

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
8.15	J19YF8/ J19YH6
1.68	J19YF4
1.63	J19YF5
1.44	J19YF6
1.07	J19YF7
9.71	J19YF9
71.0	J19YH0
18.0	J1FKL6
84.1	J19YH2
11.7	J19YH3
53.5	J19YH4
17.0	J19YH5
15.4	J1B4H9
8.78	J1B4J0
27.5	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	22.0
Censored		Lognormal mean	28.2
Detection limit or PQL		Std. devn.	26.3
Method detection limit		Median	11.7
TOTAL	12	Min.	1.07
		Max.	84.1

Lognormal distribution? r-squared is: 0.941
Normal distribution? r-squared is: 0.764
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 105

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
3.96	J19YF8/ J19YH6
1.68	J19YF4
1.63	J19YF5
1.56	J19YF6
0.84	J19YF7
9.53	J19YF9
36.8	J19YH0
3.70	J1FKL6
64.5	J19YH2
9.20	J19YH3
98.0	J19YH4
9.28	J19YH5
4.40	J1B4H9
4.07	J1B4J0
11.6	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	17.4
Censored		Lognormal mean	17.5
Detection limit or PQL		Std. devn.	28.1
Method detection limit		Median	4.40
TOTAL	12	Min.	0.84
		Max.	98.0

Lognormal distribution? r-squared is: 0.946
Normal distribution? r-squared is: 0.610
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 62.9

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID
3.02	J19YF8/ J19YH6
1.68	J19YF4
1.63	J19YF5
1.68	J19YF6
1.64	J19YF7
3.92	J19YF9
30.4	J19YH0
9.20	J1FKL6
43.5	J19YH2
6.08	J19YH3
22.1	J19YH4
6.11	J19YH5
3.40	J1B4H9
2.53	J1B4J0
7.86	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	9.65
Censored		Lognormal mean	9.46
Detection limit or PQL		Std. devn.	12.5
Method detection limit		Median	3.92
TOTAL	12	Min.	1.63
		Max.	43.5

Lognormal distribution? r-squared is: 0.915
Normal distribution? r-squared is: 0.679
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 21.9

Chrysene 95% UCL Calculation

DATA	ID
2.47	J19YF8/ J19YH6
1.68	J19YF4
1.63	J19YF5
1.68	J19YF6
1.46	J19YF7
5.51	J19YF9
39.9	J19YH0
16.0	J1FKL6
160	J19YH2
34.1	J19YH3
17.3	J19YH4
23.7	J19YH5
18.7	J1B4H9
8.23	J1B4J0
32.5	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	24.3
Censored		Lognormal mean	28.2
Detection limit or PQL		Std. devn.	39.7
Method detection limit		Median	16.0
TOTAL	12	Min.	1.46
		Max.	160

Lognormal distribution? r-squared is: 0.928
Normal distribution? r-squared is: 0.547
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 113

Dibenz[a,h]anthracene 95% UCL Calculation

DATA	ID
1.26	J19YF8/ J19YH6
1.68	J19YF4
1.63	J19YF5
1.68	J19YF6
1.64	J19YF7
1.4	J19YF9
8.73	J19YH0
5.50	J1FKL6
19.0	J19YH2
2.49	J19YH3
10.8	J19YH4
1.60	J19YH5
1.67	J1B4H9
1.67	J1B4J0
1.49	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	4.15
Censored		Lognormal mean	3.87
Detection limit or PQL		Std. devn.	5.05
Method detection limit		Median	1.67
TOTAL	12	Min.	1.26
		Max.	19.0

Lognormal distribution? r-squared is: 0.738
Normal distribution? r-squared is: 0.607
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 6.29

Fluoranthene 95% UCL Calculation

DATA	ID
15.1	J19YF8/ J19YH6
3.98	J19YF4
1.39	J19YF5
6.45	J19YF6
6.55	J19YF7
15.3	J19YF9
161	J19YH0
6.50	J1FKL6
269	J19YH2
29.1	J19YH3
54.6	J19YH4
29.5	J19YH5
24.6	J1B4H9
17.9	J1B4J0
65.9	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	47.1
Censored		Lognormal mean	51.8
Detection limit or PQL		Std. devn.	73.5
Method detection limit		Median	17.9
TOTAL	12	Min.	1.39
		Max.	269

Lognormal distribution? r-squared is: 0.980
Normal distribution? r-squared is: 0.614
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 188

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
4.87	J19YF8/ J19YH6
0.84	J19YF4
1.08	J19YF5
1.56	J19YF6
1.18	J19YF7
7.89	J19YF9
42.40	J19YH0
14.00	J1FKL6
71.30	J19YH2
12.80	J19YH3
68.8	J19YH4
9.37	J19YH5
8.95	J1B4H9
5.05	J1B4J0
16.5	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	17.8
Censored		Lognormal mean	21.6
Detection limit or PQL		Std. devn.	23.6
Method detection limit		Median	8.95
TOTAL	12	Min.	0.84
		Max.	71.3

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.701
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 83.4

Phenanthrene 95% UCL Calculation

DATA	ID
4.93	J19YF8/ J19YH6
1.31	J19YF4
1.19	J19YF5
1.38	J19YF6
1.61	J19YF7
4.49	J19YF9
86.9	J19YH0
15.0	J1FKL6
201	J19YH2
11.3	J19YH3
14.1	J19YH4
10.4	J19YH5
7.35	J1B4H9
6.48	J1B4J0
26.8	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	26.3
Censored		Lognormal mean	25.1
Detection limit or PQL		Std. devn.	52.9
Method detection limit		Median	7.35
TOTAL	12	Min.	1.19
		Max.	201

Lognormal distribution? r-squared is: 0.940
Normal distribution? r-squared is: 0.491
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 107

Pyrene 95% UCL Calculation

DATA	ID
12.2	J19YF8/ J19YH6
1.44	J19YF4
1.27	J19YF5
3.14	J19YF6
2.38	J19YF7
9.1	J19YF9
176	J19YH0
34.0	J1FKL6
290	J19YH2
39.6	J19YH3
51.9	J19YH4
28.7	J19YH5
18	J1B4H9
13.8	J1B4J0
49.6	J1B4J1

Number of samples		Uncensored values	
Uncensored	12	Mean	48.8
Censored		Lognormal mean	63.1
Detection limit or PQL		Std. devn.	79.7
Method detection limit		Median	18.3
TOTAL	12	Min.	1.27
		Max.	290

Lognormal distribution? r-squared is: 0.970
Normal distribution? r-squared is: 0.600
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 342

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Ecology Software (MTCAStat) Results, 116-H-5 Overburden

DATA	ID	Fluoride 95% UCL Calculation			
0.7	J19YF8/ J19YH6				
0.7	J19YF4				
0.7	J19YF5	Number of samples		Uncensored values	
0.7	J19YF6	Uncensored	12	Mean	0.7
0.6	J19YF7	Censored		Lognormal mean	0.7
0.8	J19YF9	Detection limit or PQL		Std. devn.	0.2
0.8	J19YH0	Method detection limit		Median	0.7
1.1	J1FKL6	TOTAL	12	Min.	0.3
0.7	J19YH2			Max.	1.1
0.6	J19YH3				
1.0	J19YH4				
0.7	J19YH5				
0.5	J1B4H9				
0.7	J1B4J0	Lognormal distribution?		Normal distribution?	
0.3	J1B4J1	r-squared is: 0.839		r-squared is: 0.895	
		Recommendations:			
		Reject BOTH lognormal and normal distributions			
		UCL (based on Z-statistic) is	0.8		

DATA	ID	Nitrogen in nitrate 95% UCL Calculation			
0.8	J19YF8/ J19YH6				
0.3	J19YF4				
0.3	J19YF5	Number of samples		Uncensored values	
1.3	J19YF6	Uncensored	12	Mean	1.5
0.5	J19YF7	Censored		Lognormal mean	1.5
1.6	J19YF9	Detection limit or PQL		Std. devn.	1.4
0.3	J19YH0	Method detection limit		Median	0.9
1.0	J1FKL6	TOTAL	12	Min.	0.3
0.5	J19YH2			Max.	5.1
2.5	J19YH3				
0.9	J19YH4				
0.9	J19YH5				
5.1	J1B4H9				
3.1	J1B4J0	Lognormal distribution?		Normal distribution?	
3.2	J1B4J1	r-squared is: 0.966		r-squared is: 0.813	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	3.0		

DATA	ID	Nitrogen in nitrate and nitrite 95% UCL Calculation			
0.7	J19YF8/ J19YH6				
0.6	J19YF4				
0.3	J19YF5	Number of samples		Uncensored values	
1.4	J19YF6	Uncensored	12	Mean	1.5
0.6	J19YF7	Censored		Lognormal mean	1.5
1.3	J19YF9	Detection limit or PQL		Std. devn.	1.2
1.3	J19YH0	Method detection limit		Median	1.0
0.8	J1FKL6	TOTAL	12	Min.	0.3
0.7	J19YH2			Max.	4.6
2.5	J19YH3				
1.0	J19YH4				
1.0	J19YH5				
4.6	J1B4H9				
3.0	J1B4J0	Lognormal distribution?		Normal distribution?	
2.9	J1B4J1	r-squared is: 0.967		r-squared is: 0.812	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	2.4		

DATA	ID	Sulfate 95% UCL Calculation			
5.9	J19YF8/ J19YH6				
2.9	J19YF4				
6.4	J19YF5	Number of samples		Uncensored values	
6.6	J19YF6	Uncensored	12	Mean	6.5
4.3	J19YF7	Censored		Lognormal mean	6.6
14	J19YF9	Detection limit or PQL		Std. devn.	2.8
8.8	J19YH0	Method detection limit		Median	6.4
6.9	J1FKL6	TOTAL	12	Min.	2.9
3.0	J19YH2			Max.	14
7.7	J19YH3				
7.4	J19YH4				
3.8	J19YH5				
6.4	J1B4H9				
5.4	J1B4J0	Lognormal distribution?		Normal distribution?	
8.0	J1B4J1	r-squared is: 0.945		r-squared is: 0.870	
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	8.2		

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Ecology Software (MTCAStat) Results, 116-H-5 Staging Pile Area

Arsenic 95% UCL Calculation

DATA	ID
1.9	J1FKM0/ J1FKM9
2.2	J1FKL7
1.7	J1FKL8
1.5	J1FKL9
7.8	J1FKM1
9.1	J1FKM2
14.1	J1FKM3
6.7	J1FKM4
12.2	J1FKM5
3.4	J1FKM6
2.2	J1FKM7
14.2	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	6.4
Censored		Lognormal mean	6.8
Detection limit or PQL		Std. devn.	5.0
Method detection limit		Median	5.1
TOTAL	12	Min.	1.5
		Max.	14.2

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.871
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.0

Barium 95% UCL Calculation

DATA	ID
34.7	J1FKM0/ J1FKM9
36.4	J1FKL7
33.5	J1FKL8
37.3	J1FKL9
88.8	J1FKM1
60.5	J1FKM2
126	J1FKM3
68.3	J1FKM4
82.9	J1FKM5
40.6	J1FKM6
43.0	J1FKM7
72.5	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	60.4
Censored		Lognormal mean	60.6
Detection limit or PQL		Std. devn.	28.6
Method detection limit		Median	51.8
TOTAL	12	Min.	33.5
		Max.	126

Lognormal distribution? r-squared is: 0.920
Normal distribution? r-squared is: 0.866
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 80.0

Beryllium 95% UCL Calculation

DATA	ID
0.080	J1FKM0/ J1FKM9
0.089	J1FKL7
0.079	J1FKL8
0.069	J1FKL9
0.15	J1FKM1
0.15	J1FKM2
0.17	J1FKM3
0.10	J1FKM4
0.22	J1FKM5
0.047	J1FKM6
0.028	J1FKM7
0.16	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	0.11
Censored		Lognormal mean	0.12
Detection limit or PQL		Std. devn.	0.057
Method detection limit		Median	0.095
TOTAL	12	Min.	0.028
		Max.	0.22

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.17

Boron 95% UCL Calculation

DATA	ID
0.47	J1FKM0/ J1FKM9
0.88	J1FKL7
0.48	J1FKL8
0.43	J1FKL9
6.9	J1FKM1
2.1	J1FKM2
1.7	J1FKM3
1.2	J1FKM4
1.4	J1FKM5
0.48	J1FKM6
0.42	J1FKM7
1.8	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	1.52
Censored		Lognormal mean	1.48
Detection limit or PQL		Std. devn.	1.80
Method detection limit		Median	1.04
TOTAL	12	Min.	0.42
		Max.	6.90

Lognormal distribution? r-squared is: 0.884
Normal distribution? r-squared is: 0.598
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 2.4

Cadmium 95% UCL Calculation

DATA	ID
0.067	J1FKM0/ J1FKM9
0.043	J1FKL7
0.049	J1FKL8
0.077	J1FKL9
0.15	J1FKM1
0.11	J1FKM2
0.12	J1FKM3
0.10	J1FKM4
0.14	J1FKM5
0.059	J1FKM6
0.077	J1FKM7
0.12	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	0.093
Censored		Lognormal mean	0.094
Detection limit or PQL		Std. devn.	0.036
Method detection limit		Median	0.089
TOTAL	12	Min.	0.043
		Max.	0.15

Lognormal distribution? r-squared is: 0.963
Normal distribution? r-squared is: 0.965
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.12

Chromium 95% UCL Calculation

DATA	ID
9.20	J1FKM0/ J1FKM9
9.20	J1FKL7
9.40	J1FKL8
6.10	J1FKL9
11.0	J1FKM1
9.60	J1FKM2
11.9	J1FKM3
10.5	J1FKM4
13.1	J1FKM5
9.40	J1FKM6
9.40	J1FKM7
11.6	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	10.0
Censored		Lognormal mean	10.1
Detection limit or PQL		Std. devn.	1.78
Method detection limit		Median	9.50
TOTAL	12	Min.	6.10
		Max.	13.1

Lognormal distribution? r-squared is: 0.845
Normal distribution? r-squared is: 0.900
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 11.0

Cobalt 95% UCL Calculation

DATA	ID
5.0	J1FKM0/ J1FKM9
4.9	J1FKL7
5.2	J1FKL8
4.5	J1FKL9
6.3	J1FKM1
6.0	J1FKM2
7.2	J1FKM3
7.2	J1FKM4
7.9	J1FKM5
6.7	J1FKM6
6.8	J1FKM7
6.8	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	6.2
Censored		Lognormal mean	6.2
Detection limit or PQL		Std. devn.	1.1
Method detection limit		Median	6.5
TOTAL	12	Min.	4.5
		Max.	7.9

Lognormal distribution? r-squared is: 0.936
Normal distribution? r-squared is: 0.950
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.9

Copper 95% UCL Calculation

DATA	ID
11.9	J1FKM0/ J1FKM9
11.3	J1FKL7
12.1	J1FKL8
12.5	J1FKL9
15.9	J1FKM1
13.5	J1FKM2
15.6	J1FKM3
17.0	J1FKM4
14.9	J1FKM5
14.0	J1FKM6
12.9	J1FKM7
14.0	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	13.8
Censored		Lognormal mean	13.8
Detection limit or PQL		Std. devn.	1.78
Method detection limit		Median	13.8
TOTAL	12	Min.	11.3
		Max.	17.0

Lognormal distribution? r-squared is: 0.983
Normal distribution? r-squared is: 0.975
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.8

Lead 95% UCL Calculation

DATA	ID
2.55	J1FKM0/ J1FKM9
2.00	J1FKL7
2.10	J1FKL8
2.30	J1FKL9
30.7	J1FKM1
35.3	J1FKM2
70.5	J1FKM3
20.0	J1FKM4
32.7	J1FKM5
5.50	J1FKM6
2.30	J1FKM7
58.5	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	22.0
Censored		Lognormal mean	28.5
Detection limit or PQL		Std. devn.	23.9
Method detection limit		Median	12.8
TOTAL	12	Min.	2.00
		Max.	70.5

Lognormal distribution? r-squared is: 0.857
Normal distribution? r-squared is: 0.835
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 33.4

CALCULATION SHEET

Washington Closure Hanford

Originator	J. D. Skoglie	Date	05/17/11
Project	100-H Field Remediation	Job No.	14655
Subject	116-H-5 Waste Site Cleanup Verification 95% UCL Calculations		
Calc. No.	0100H-CA-V0164	Rev. No.	0
Checked	T. E. Queen	Date	05/17/11
		Sheet No.	41 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Staging Pile Area

Manganese 95% UCL Calculation

DATA	ID				
224	J1FKM0/ J1FKM9				
218	J1FKL7				
231	J1FKL8	Number of samples		Uncensored values	
182	J1FKL9	Uncensored	12	Mean	256
254	J1FKM1	Censored		Lognormal mean	256
252	J1FKM2	Detection limit or PQL		Std. devn.	48
300	J1FKM3	Method detection limit		Median	247
286	J1FKM4	TOTAL	12	Min.	182
362	J1FKM5			Max.	362
230	J1FKM6				
241	J1FKM7				
294	J1FKM8				

Lognormal distribution? r-squared is: 0.959
Normal distribution? r-squared is: 0.931
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 283

Nickel 95% UCL Calculation

DATA	ID				
9.30	J1FKM0/ J1FKM9				
9.40	J1FKL7				
10.5	J1FKL8	Number of samples		Uncensored values	
7.00	J1FKL9	Uncensored	12	Mean	9.92
10.8	J1FKM1	Censored		Lognormal mean	9.93
9.50	J1FKM2	Detection limit or PQL		Std. devn.	1.50
11.2	J1FKM3	Method detection limit		Median	9.95
9.70	J1FKM4	TOTAL	12	Min.	7.00
12.8	J1FKM5			Max.	12.8
10.2	J1FKM6				
8.00	J1FKM7				
10.6	J1FKM8				

Lognormal distribution? r-squared is: 0.934
Normal distribution? r-squared is: 0.954
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 10.8

Vanadium 95% UCL Calculation

DATA	ID				
36.9	J1FKM0/ J1FKM9				
36.8	J1FKL7				
38.4	J1FKL8	Number of samples		Uncensored values	
36.4	J1FKL9	Uncensored	12	Mean	43.8
41.1	J1FKM1	Censored		Lognormal mean	43.8
36.1	J1FKM2	Detection limit or PQL		Std. devn.	7.53
46.4	J1FKM3	Method detection limit		Median	43.3
59.2	J1FKM4	TOTAL	12	Min.	36.1
45.4	J1FKM5			Max.	59.2
49.8	J1FKM6				
53.3	J1FKM7				
45.8	J1FKM8				

Lognormal distribution? r-squared is: 0.922
Normal distribution? r-squared is: 0.907
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 48.0

Zinc 95% UCL Calculation

DATA	ID				
28.3	J1FKM0/ J1FKM9				
26.4	J1FKL7				
27.9	J1FKL8	Number of samples		Uncensored values	
25.7	J1FKL9	Uncensored	12	Mean	36.0
40.6	J1FKM1	Censored		Lognormal mean	36.1
36.4	J1FKM2	Detection limit or PQL		Std. devn.	8.15
44.8	J1FKM3	Method detection limit		Median	34.7
44.6	J1FKM4	TOTAL	12	Min.	25.7
48.6	J1FKM5			Max.	48.6
32.8	J1FKM6				
32.9	J1FKM7				
43.5	J1FKM8				

Lognormal distribution? r-squared is: 0.935
Normal distribution? r-squared is: 0.934
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 41.1

Benzo(a)anthracene 95% UCL Calculation

DATA	ID				
200	J1FKM0/ J1FKM9				
1.7	J1FKL7				
1.7	J1FKL8	Number of samples		Uncensored values	
25	J1FKL9	Uncensored	12	Mean	31
19	J1FKM1	Censored		Lognormal mean	40
21	J1FKM2	Detection limit or PQL		Std. devn.	55
22	J1FKM3	Method detection limit		Median	20
31	J1FKM4	TOTAL	12	Min.	1.6
8.9	J1FKM5			Max.	200
1.6	J1FKM6				
1.6	J1FKM7				
44	J1FKM8				

Lognormal distribution? r-squared is: 0.890
Normal distribution? r-squared is: 0.520
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 58

Benzo(a)pyrene 95% UCL Calculation

DATA	ID				
145	J1FKM0/ J1FKM9				
3.3	J1FKL7				
6.8	J1FKL8	Number of samples		Uncensored values	
17	J1FKL9	Uncensored	12	Mean	27
22	J1FKM1	Censored		Lognormal mean	28
27	J1FKM2	Detection limit or PQL		Std. devn.	39
37	J1FKM3	Method detection limit		Median	20
25	J1FKM4	TOTAL	12	Min.	3.2
10	J1FKM5			Max.	145
3.2	J1FKM6				
3.3	J1FKM7				
27	J1FKM8				

Lognormal distribution? r-squared is: 0.927
Normal distribution? r-squared is: 0.567
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 88.5

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID				
165	J1FKM0/ J1FKM9				
2.2	J1FKL7				
2.2	J1FKL8	Number of samples		Uncensored values	
20	J1FKL9	Uncensored	12	Mean	27
25	J1FKM1	Censored		Lognormal mean	30
20	J1FKM2	Detection limit or PQL		Std. devn.	45
20	J1FKM3	Method detection limit		Median	20
21	J1FKM4	TOTAL	12	Min.	2.1
2.3	J1FKM5			Max.	165
2.1	J1FKM6				
2.2	J1FKM7				
37	J1FKM8				

Lognormal distribution? r-squared is: 0.842
Normal distribution? r-squared is: 0.519
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 48

Benzo(k)fluoranthene 95% UCL Calculation

DATA	ID				
78	J1FKM0/ J1FKM9				
2.1	J1FKL7				
2.1	J1FKL8	Number of samples		Uncensored values	
11	J1FKL9	Uncensored	12	Mean	13
9.8	J1FKM1	Censored		Lognormal mean	12
10	J1FKM2	Detection limit or PQL		Std. devn.	21
8.9	J1FKM3	Method detection limit		Median	9.3
9.7	J1FKM4	TOTAL	12	Min.	1.9
2.2	J1FKM5			Max.	78
1.9	J1FKM6				
2.0	J1FKM7				
14	J1FKM8				

Lognormal distribution? r-squared is: 0.835
Normal distribution? r-squared is: 0.477
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 23

Chrysene 95% UCL Calculation

DATA	ID				
150	J1FKM0/ J1FKM9				
2.5	J1FKL7				
2.5	J1FKL8	Number of samples		Uncensored values	
27	J1FKL9	Uncensored	12	Mean	28
21	J1FKM1	Censored		Lognormal mean	32
24	J1FKM2	Detection limit or PQL		Std. devn.	40
26	J1FKM3	Method detection limit		Median	23
29	J1FKM4	TOTAL	12	Min.	2.4
8.7	J1FKM5			Max.	150
2.4	J1FKM6				
2.5	J1FKM7				
35	J1FKM8				

Lognormal distribution? r-squared is: 0.877
Normal distribution? r-squared is: 0.568
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 47

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie	**Date** 05/17/11	**Calc. No.** 0100H-CA-V0164	**Rev. No.** 0
Project 100-H Field Remediation	**Job No.** 14655	**Checked** T. E. Queen	**Date** 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 42 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Staging Pile Area

Indeno(1,2,3-cd)pyrene 95% UCL Calculation

DATA	ID
115	J1FKM0/ J1FKM9
6.0	J1FKL7
6.0	J1FKL8
12	J1FKL9
16	J1FKM1
21	J1FKM2
17	J1FKM3
20	J1FKM4
6.5	J1FKM5
6.0	J1FKM6
6.0	J1FKM7
27	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	22
Censored		Lognormal mean	20
Detection limit or PQL		Std. devn.	30
Method detection limit		Median	14
TOTAL	12	Min.	6.0
		Max.	115

Lognormal distribution? r-squared is: 0.837
Normal distribution? r-squared is: 0.506
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 36

Phenanthrene 95% UCL Calculation

DATA	ID
185	J1FKM0/ J1FKM9
6.0	J1FKL7
6.0	J1FKL8
13	J1FKL9
6.0	J1FKM1
19	J1FKM2
17	J1FKM3
32	J1FKM4
6.5	J1FKM5
6.0	J1FKM6
6.0	J1FKM7
14	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	26
Censored		Lognormal mean	21
Detection limit or PQL		Std. devn.	51
Method detection limit		Median	10
TOTAL	12	Min.	6.0
		Max.	185

Lognormal distribution? r-squared is: 0.755
Normal distribution? r-squared is: 0.419
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 50

Pyrene 95% UCL Calculation

DATA	ID
350	J1FKM0/ J1FKM9
6.0	J1FKL7
6.0	J1FKL8
54	J1FKL9
30	J1FKM1
51	J1FKM2
54	J1FKM3
70	J1FKM4
21	J1FKM5
6.0	J1FKM6
6.0	J1FKM7
65	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	60
Censored		Lognormal mean	65
Detection limit or PQL		Std. devn.	95
Method detection limit		Median	41
TOTAL	12	Min.	6.0
		Max.	350

Lognormal distribution? r-squared is: 0.886
Normal distribution? r-squared is: 0.531
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 105

Bis(2-ethylhexyl)phthalate 95% UCL Calculation

DATA	ID
110	J1FKM0/ J1FKM9
110	J1FKL7
110	J1FKL8
100	J1FKL9
130	J1FKM1
130	J1FKM2
120	J1FKM3
120	J1FKM4
120	J1FKM5
110	J1FKM6
110	J1FKM7
130	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	117
Censored		Lognormal mean	117
Detection limit or PQL		Std. devn.	10
Method detection limit		Median	115
TOTAL	12	Min.	100
		Max.	130

Lognormal distribution? r-squared is: 0.889
Normal distribution? r-squared is: 0.887
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 121

Fluoride 95% UCL Calculation

DATA	ID
0.41	J1FKM0/ J1FKM9
0.42	J1FKL7
0.41	J1FKL8
0.43	J1FKL9
0.43	J1FKM1
0.95	J1FKM2
1.1	J1FKM3
1.8	J1FKM4
0.96	J1FKM5
0.88	J1FKM6
1.1	J1FKM7
0.97	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	0.82
Censored		Lognormal mean	0.83
Detection limit or PQL		Std. devn.	0.42
Method detection limit		Median	0.92
TOTAL	12	Min.	0.41
		Max.	1.80

Lognormal distribution? r-squared is: 0.850
Normal distribution? r-squared is: 0.835
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.0

Nitrogen in nitrate 95% UCL Calculation

DATA	ID
0.42	J1FKM0/ J1FKM9
0.35	J1FKL7
0.36	J1FKL8
0.36	J1FKL9
40.1	J1FKM1
44.8	J1FKM2
0.61	J1FKM3
0.94	J1FKM4
0.55	J1FKM5
0.41	J1FKM6
1.1	J1FKM7
0.76	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	7.6
Censored		Lognormal mean	5.1
Detection limit or PQL		Std. devn.	16
Method detection limit		Median	0.6
TOTAL	12	Min.	0.4
		Max.	45

Lognormal distribution? r-squared is: 0.657
Normal distribution? r-squared is: 0.48
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 15.3

Nitrogen in nitrate and nitrite 95% UCL Calculation

DATA	ID
0.18	J1FKM0/ J1FKM9
0.18	J1FKL7
0.19	J1FKL8
0.19	J1FKL9
39.9	J1FKM1
50.9	J1FKM2
0.43	J1FKM3
0.85	J1FKM4
0.46	J1FKM5
0.18	J1FKM6
1.1	J1FKM7
0.62	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	7.9
Censored		Lognormal mean	5.8
Detection limit or PQL		Std. devn.	18
Method detection limit		Median	0.4
TOTAL	12	Min.	0.2
		Max.	51

Lognormal distribution? r-squared is: 0.732
Normal distribution? r-squared is: 0.487
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 16

Sulfate 95% UCL Calculation

DATA	ID
1.8	J1FKM0/ J1FKM9
2.1	J1FKL7
0.85	J1FKL8
2.0	J1FKL9
43.6	J1FKM1
18.2	J1FKM2
2.0	J1FKM3
55.6	J1FKM4
2.8	J1FKM5
5.4	J1FKM6
9.1	J1FKM7
3.3	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	12.2
Censored		Lognormal mean	12.3
Detection limit or PQL		Std. devn.	18.3
Method detection limit		Median	3.05
TOTAL	12	Min.	0.85
		Max.	55.6

Lognormal distribution? r-squared is: 0.906
Normal distribution? r-squared is: 0.652
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 51.6

TPH - diesel range 95% UCL Calculation

DATA	ID
4550	J1FKM0/ J1FKM9
345	J1FKL7
320	J1FKL8
345	J1FKL9
11000	J1FKM1
8500	J1FKM2
9500	J1FKM3
7100	J1FKM4
4400	J1FKM5
820	J1FKM6
345	J1FKM7
4000	J1FKM8

Number of samples		Uncensored values	
Uncensored	12	Mean	4269
Censored		Lognormal mean	6158
Detection limit or PQL		Std. devn.	3959
Method detection limit		Median	4200
TOTAL	12	Min.	320
		Max.	11000

Lognormal distribution? r-squared is: 0.841
Normal distribution? r-squared is: 0.891
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 6149

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-H Field Remediation
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations

Date 05/17/11
Job No. 14655

Calc. No. 0100H-CA-V0164
Checked T. E. Queen

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Date 05/17/11
Sheet No. 43 of 47

Ecology Software (MTCAStat) Results, 116-H-5 Overburden

	DATA	ID	TPH-diesel range EXT 95% UCL Calculation				DATA	ID	TPH-motor oil (high boiling) 95% UCL Calculation			
2	10350	J1FKM0/ J1FKM9					52850	J19YJ4/ J19YJ9				
3	500	J1FKL7					184000	J19YH7				
4	470	J1FKL8	Number of samples		Uncensored values		17400	J19YH8	Number of samples		Uncensored values	
5	500	J1FKL9	Uncensored	12	Mean	12410	10400	J19YH9	Uncensored	12	Mean	54368
6	41000	J1FKM1	Censored		Lognormal mean	21532	8660	J19YJ0	Censored		Lognormal mean	58228
7	30000	J1FKM2	Detection limit or PQL		Std. devn.	14620	14900	J19YJ1	Detection limit or PQL		Std. devn.	55168
8	35000	J1FKM3	Method detection limit		Median	8250	141000	J19YJ2	Method detection limit		Median	45975
9	12000	J1FKM4	TOTAL	12	Min.	470	10500	J19YJ3	TOTAL	12	Min.	8660
10	7700	J1FKM5			Max.	41000	60800	J19YJ5			Max.	184000
11	2100	J1FKM6					58900	J19YJ6				
12	500	J1FKM7					39100	J19YJ7				
13	8800	J1FKM8					53900	J19YJ8				
14												
15			Lognormal distribution?		Normal distribution?				Lognormal distribution?		Normal distribution?	
16			r-squared is: 0.880		r-squared is: 0.807				r-squared is: 0.937		r-squared is: 0.782	
17			Recommendations:						Recommendations:			
18			Reject BOTH lognormal and normal distributions						Use lognormal distribution.			
19												
20			UCL (based on Z-statistic) is		19353				UCL (Land's method) is		147061	
21												

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie Date 05/17/11 Calc. No. 0100H-CA-V0164 Rev. No. 0
Project 100-H Field Remediation Job No. 14655 Checked T. E. Queen Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 44 of 47

Duplicate Analysis - 116-H-5 Waste Site Shallow Zone

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Uranium-233/234			Uranium-238			Aluminum			Arsenic		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	14.6		0.54	0.683		0.148	1.17		0.266	0.977		0.102	1.17		0.266	0.770		0.226	0.681		0.226	8400		18.1	4.27		0.907
Duplicate of J19YB9	J19YD0	5/18/10	13.0		0.676	0.670		0.154	1.09		0.371	0.965		0.097	1.09		0.371	0.930		0.178	0.768		0.178	7600		13.9	3.99		0.695

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA	Uranium-233/234	Uranium-238	Aluminum	Arsenic
	TDL	0.5	0.1	0.2	1	1	1	1	5	10
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	11.6%	1.9%	7.1%					10.0%	
	Difference > 2 TDL?	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Barium			Beryllium			Boron			Calcium			Chromium			Cobalt			Copper			Iron			Lead		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	67.8		0.453	0.263		0.181	1.22	B	1.81	4240		18.1	21.2		0.907	6.33		2.72	12.5		1.81	21700		18.1	4.66		0.907
Duplicate of J19YB9	J19YD0	5/18/10	60.1		0.348	0.232		0.139	1.11	B	1.39	4040		13.9	15.9		0.695	5.42		2.09	11.4		1.39	18700		13.9	5.41		0.695

Analysis:

		Barium	Beryllium	Boron	Calcium	Chromium	Cobalt	Copper	Iron	Lead
	TDL	2	0.2	2	100	1	2	1	5	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)		Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	12.0%			4.8%	28.6%		9.2%	14.9%	
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Magnesium			Manganese			Molybdenum			Nickel			Potassium			Silicon			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	4670		4.53	278		0.907	0.294	B	0.907	15.6		2.27	1200		90.7	571		5.44	165		45.3	52.6		0.91	37.8		2.72
Duplicate of J19YB9	J19YD0	5/18/10	4110		3.48	256		0.695	0.243	B	0.695	12.2		1.74	1100		69.5	512		4.17	147		34.8	43.7		0.70	33.9		2.09

Analysis:

		Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silicon	Sodium	Vanadium	Zinc
	TDL	75	5	2	4	400	2	50	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)		No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	12.8%	8.2%				10.9%		18.5%	10.9%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(b)fluoranthene (Method 8310)			Phenanthrene (Method 8310)			Fluoride			Nitrogen in nitrate *			Nitrogen in nitrate and nitrite			Phosphorous in phosphate			Sulfate		
			ug/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	1.16	J	3.87	1.16	J	3.87	0.7	B	2.8	0.59	JB	0.63	0.49		0.22	1.3	J	0.9	2.6	B	2.8
Duplicate of J19YB9	J19YD0	5/18/10	1.54	J	3.43	1.20	J	3.43	0.8	B	2.5	0.84		0.56	0.62		0.19	4.2		2.5	3.2		2.5

Analysis:

		Benzo(b)fluoranthene (Method 8310)	Phenanthrene (Method 8310)	Fluoride	Nitrogen in nitrate *	Nitrogen in nitrate and nitrite	Phosphorous in phosphate	Sulfate
	TDL	15	15	5	0.75	0.75	5	5
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?					No-Stop (acceptable)	No-Stop (acceptable)	
	RPD							
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie | Date 05/17/11 | Calc. No. 0100H-CA-V0164 | Rev. No. 0
Project 100-H Field Remediation | Job No. 14655 | Checked T. E. Queen | Date 05/17/11
Subject 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 45 of 47

Duplicate Analysis - 116-H-5 Waste Site Deep Zone

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Uranium-233/234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ-1	J19YD1	5/18/10	15.1		0.78	0.502		0.135	0.800		0.302	0.668		0.086	0.800		0.302	0.766		0.279	0.620		0.279
Duplicate of J19YD1	J19YF3	5/18/10	15.1		0.852	0.576		0.128	0.539		0.333	0.731		0.086	0.539		0.333	0.567		0.181	0.543		0.181

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA	Uranium-233/234	Uranium-238
TDL		0.5	0.1	0.2	1	1	1	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	0.0%	13.7%					
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Copper		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	6430		1.4	6.0		0.60	43.4		0.069	0.12	B	0.030	0.14	B	0.037	5170		12.9	12.8		0.053	5.3	X	0.091	18.5		0.20
Duplicate of J1HH85[a]	J1HH86	4/13/11	6810		1.5	6.7		0.64	42.1		0.074	0.13	B	0.032	0.19		0.040	4840		13.7	15.1		0.056	5.4	X	0.097	16.2		0.21

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper
TDL		5	10	2	0.2	0.2	100	1	2	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)
	RPD	5.7%		3.0%			6.6%	16.5%		13.3%
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Nickel			Potassium			Silicon			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	14500		3.5	14.3	X	0.25	3940		3.4	221		0.091	0.019		0.0050	9.9	X	0.11	843		37.5	192		5.2	244		53.9
Duplicate of J1HH85[a]	J1HH86	4/13/11	15100		3.7	17.3	X	0.26	4280		3.6	228		0.097	0.020		0.0050	11.3	X	0.12	891		39.9	219		5.5	236		57.4

Analysis:

		Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silicon	Sodium
TDL		5	5	75	5	0.2	4	400	2	50
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	4.1%		8.3%	3.1%				13.1%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Vanadium			Zinc			Bis(2-ethylhexyl)phthalate			Fluoride			Nitrogen in nitrate[a]			Nitrogen in nitrate and nitrite			Phosporous in phosphate			Sulfate			TPH - motor oil (high boiling)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
DZ-8 re-sample 2[a]	J1HH85	4/13/11	35.9		0.086	60.8		0.36	69	JB	47																		
Duplicate of J1HH85[a]	J1HH86	4/13/11	37.1		0.091	77.2		0.39	83	JB	47																		
DZ-1	J19YD1	5/18/10										0.9	B	2.3	2.78	J	0.52	1.7		0.21	2.5	J	2.3	7.8		2.3	5670	J	10200
Duplicate of J19YD1	J19YF3	5/18/10										1.2	B	2.4	2.64		0.54	1.62		0.22	3.2		2.4	8.4		2.4	3480	J	10400

Analysis:

		Vanadium	Zinc	Bis(2-ethylhexyl)phthalate	Fluoride	Nitrogen in nitrate	Nitrogen in nitrate and nitrite	Phosporous in phosphate	Sulfate	TPH - motor oil (high boiling)
TDL		2.5	1	660	5	0.75	0.75	5	5	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	
	RPD	3.3%	23.8%							
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator: J. D. Skoglie	Date: 05/17/11	Calc. No. 0100H-CA-V0164	Rev. No. 0
Project: 100-H Field Remediation	Job No. 14655	Checked: T. E. Queen	Date: 05/17/11
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 46 of 47

Duplicate Analysis - 116-H-5 Waste Site Overburden

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Uranium-233/234			Uranium-238			Aluminum			Antimony		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	12.9		0.766	0.410		0.170	0.619		0.346	0.706		0.118	0.619		0.346	0.517		0.172	0.427		0.172	6390		16.3	0.344	B	0.813
Duplicate of J19YF8	J19YH6	5/13/10	14.6		1.16	0.488		0.175	1.00		0.326	0.944		0.135	1.00		0.326	0.579		0.201	0.526		0.201	6090		19.0	0.388	B	0.951

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA	Uranium-233/234	Uranium-238	Aluminum	Antimony
TDL		0.5	0.1	0.2	1	1	1	1	5	0.6
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	
	RPD	12.4%							4.8%	
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Calcium			Chromium			Cobalt			Copper			Iron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	4.95		0.813	51.4		0.407	0.162	B	0.163	0.938	B	1.63	4560		16.3	10.4		0.813	5.41		2.44	12.7		1.63	16200		16.3
Duplicate of J19YF8	J19YH6	5/13/10	4.74		0.951	47.2		0.478	0.149	B	0.190	0.842	B	1.90	4040		19.0	10.1		0.951	5.16		2.85	12.7		1.90	15800		19.0

Analysis:

		Arsenic	Barium	Beryllium	Boron	Calcium	Chromium	Cobalt	Copper	Iron
TDL		10	2	0.2	2	100	1	2	1	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)			Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD		8.5%			12.1%	2.9%		0.0%	2.5%
	Difference > 2 TDL?	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Lead			Magnesium			Manganese			Nickel			Potassium			Silicon			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	13.1		0.813	4170		4.07	250		0.813	11.1		2.03	819		81.3	172		4.88	190		40.7	42.5		0.813	32.2		2.44
Duplicate of J19YF8	J19YH6	5/13/10	13.0		0.951	4130		4.76	239		0.951	10.6		2.38	742		95.1	196		5.71	190		47.6	39.5		0.951	31.2		2.85

Analysis:

		Lead	Magnesium	Manganese	Nickel	Potassium	Silicon	Sodium	Vanadium	Zinc
TDL		5	75	5	4	400	2	50	2.5	1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD		1.0%	4.5%			13.0%		7.3%	3.2%
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(a)anthracene (Method 8310)			Benzo(a)pyrene (Method 8310)			Benzo(b)fluoranthene (Method 8310)			Benzo(ghi)perylene (Method 8310)			Benzo(k)fluoranthene (Method 8310)			Chrysene (Method 8310)			Fluoranthene (Method 8310)			Indeno(1,2,3-cd)pyrene (Method 8310)			Phenanthrene (Method 8310)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
OB-5	J19YF8	5/13/10	5.88		3.25	7.38		3.25	8.77		3.25	4.89		3.25	3.72		3.25	3.77		3.25	21		3.25	5.72		3.25	6.78		3.25
Duplicate of J19YF8	J19YH6	5/13/10	4.07		3.25	4.25		3.25	7.52		3.25	3.03	J	3.25	2.31	J	3.25	1.17	J	3.25	9.18		3.25	4.02		3.25	3.08	J	3.25

Analysis:

		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene
TDL		15	15	15	15	15	15	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)				No-Stop (acceptable)	No-Stop (acceptable)	
	RPD									
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Pyrene (Method 8310)			Fluoride			Nitrogen in nitrate [a]			Nitrogen in nitrate and nitrite			Sulfate		
			ug/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	17.2		3.25	0.8	B	2.5	0.70		0.56	0.66		0.20	5.6		2.5
Duplicate of	J19YH6	5/13/10	7.13		3.25	0.5	B	2.5	0.81		0.56	0.75		0.20	6.2		2.5

Analysis:

		Pyrene	Fluoride	Nitrogen in nitrate	Nitrogen in nitrate and nitrite	Sulfate
TDL		15	5	0.75	0.75	5
Duplicate Analysis	Both > PQL?	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)		No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD					
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator: J. D. Skoglie	Date: 05/17/11	Calc. No.: 0100H-CA-V0164	Rev. No.: 0
Project: 100-H Field Remediation	Job No.: 14655	Checked: T. E. Queen	Date: 05/17/11
Subject: 116-H-5 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No.: 47 of 47

Duplicate Analysis - 116-H-5 Waste Site Staging Pile Area

Sampling Area	Sample Number	Sample Date	Potassium-40 pCi/g	Q	MDA	Radium-226 pCi/g	Q	MDA	Radium-228 pCi/g	Q	MDA	Thorium-228 GEA pCi/g	Q	MDA	Thorium-232 GEA pCi/g	Q	MDA
SPA-8	J19YJ4	5/17/10	12.3		0.628	0.506		0.140	0.500		0.255	0.573		0.079	0.500		0.255
Duplicate of J19YJ4	J19YJ9	5/17/10	15.7		0.301	0.567		0.057	0.829		0.137	0.831		0.036	0.829		0.137

Analysis:

		Potassium-40	Radium-226	Radium-228	Thorium-228 GEA	Thorium-232 GEA
TDL		0.5	0.1	0.2	1	1
Duplicate Analysis	Both > PQL?	Yes (continue)		Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	24.3%	11.4%			
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Aluminum mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Calcium mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	5420	X	1.4	1.7		0.58	32.9	X	0.067	0.085	B	0.029	0.054	B	0.036	5790	X	12.4
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	5260	X	1.6	2.1		0.69	36.4	X	0.079	0.074	B	0.034	0.079	B	0.043	5660	X	14.7

Sampling Area	HEIS Number	Sample Date	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Iron mg/kg	Q	PQL	Lead mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	8.8	X	0.051	4.9	X	0.088	12.3		0.19	12900	X	3.3	2.7	X	0.24
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	9.6	X	0.060	5.1	X	0.10	11.4		0.23	13100	X	4.0	2.4	X	0.28

Analysis:

		Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
TDL		5	10	2	0.2	0.2	100	1	2	1	5	5
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	3.0%		10.1%			2.3%	8.7%		7.6%	1.5%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Magnesium mg/kg	Q	PQL	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Potassium mg/kg	Q	PQL	Silicon mg/kg	Q	PQL	Sodium mg/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	3760	X	3.3	222	X	0.088	8.3	X	0.11	601		36.1	164	N	5.0	185		52.0
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	4040	X	3.8	225	X	0.10	10.3	X	0.13	689		42.6	195	N	5.9	203		61.4

Sampling Area	HEIS Number	Sample Date	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	Anthracene (Method 8310) ug/kg	Q	PQL	Benzo(a)anthracene (Method 8310) ug/kg	Q	PQL	Benzo(a)pyrene (Method 8310) ug/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	35.8		0.083	28.4	X	0.35	87		3.0	230		3.1	170		6.2
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	38.0		0.098	28.1	X	0.41	48		2.9	170		3.1	120		6.2

Analysis:

		Magnesium	Manganese	Nickel	Potassium	Silicon	Sodium	Vanadium	Zinc	Anthracene (Method 8310)	Benzo(a)anthracene (Method 8310)	Benzo(a)pyrene (Method 8310)
TDL		75	5	4	400	2	50	2.5	1	15	15	15
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	7.2%	1.3%			17.3%		6.0%	1.1%		30.0%	34.5%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	Yes - assess further	Not applicable	Not applicable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(b)fluoranthene (Method 8310) ug/kg	Q	PQL	Benzo(ghi)perylene (Method 8310) ug/kg	Q	PQL	Benzo(k)fluoranthene (Method 8310) ug/kg	Q	PQL	Chrysene (Method 8310) ug/kg	Q	PQL	Dibenz[a,h]anthracene (Method 8310) ug/kg	Q	PQL	Fluoranthene (Method 8310) ug/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	190		4.1	96		7.0	87		3.8	160		4.7	26	JX	11	400		13
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	140		4.0	38	X	6.9	69		3.8	140		4.6	19	JX	11	290		12

Sampling Area	HEIS Number	Sample Date	Fluorene (Method 8310) ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene (Method 8310) ug/kg	Q	PQL	Phenanthrene (Method 8310) ug/kg	Q	PQL	Pyrene (Method 8310) ug/kg	Q	PQL	Benzo(a)anthracene (Method 8270) ug/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	57		5.1	120		12	240		12	400		12	71	J	20
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	31		5.1	110		12	130		12	300		12	130	J	20

Analysis:

		Benzo(b)fluoranthene (Method 8310)	Benzo(ghi)perylene (Method 8310)	Benzo(k)fluoranthene (Method 8310)	Chrysene (Method 8310)	Dibenz[a,h]anthracene (Method 8310)	Fluoranthene (Method 8310)	Fluorene (Method 8310)	Indeno(1,2,3-cd)pyrene (Method 8310)	Phenanthrene (Method 8310)	Pyrene (Method 8310)	Benzo(a)anthracene (Method 8270)
TDL		15	15	15	15	15	15	15	15	15	15	660
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)	Yes (calc RPD)	No-Stop (acceptable)
	RPD	30.3%			13.3%		31.9%		8.7%	59.5%	28.6%	
	Difference > 2 TDL?	Not applicable	Yes - assess further	No - acceptable	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	Benzo(a)pyrene (Method 8270) ug/kg	Q	PQL	Benzo(b)fluoranthene (Method 8270) ug/kg	Q	PQL	Benzo(ghi)perylene (Method 8270) ug/kg	Q	PQL	Bis (2-ethylhexyl)phthalate ug/kg	Q	PQL	Chrysene (Method 8270) ug/kg	Q	PQL	Fluoranthene (Method 8270) ug/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	110	J	20	120	JX	26	41	J	16	110	JB	46	66	J	27	120	J	36
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	150	J	20	210	JX	26	68	J	16	110	JB	46	120	J	27	210	J	36

Sampling Area	HEIS Number	Sample Date	Indeno(1,2,3-cd)pyrene (Method 8270) ug/kg	Q	PQL	Phenanthrene (Method 8270) ug/kg	Q	PQL	Pyrene (Method 8270) ug/kg	Q	PQL	Nitrogen in nitrate[a] mg/kg	Q	PQL	Sulfate mg/kg	Q	PQL	TPH-diesel range ug/kg	Q	PQL
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	83	J	22	44	J	17	110	J	12	0.43	B	0.31	1.7	B	1.7	6900		690
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	110	J	22	62	J	17	190	J	12	0.41	B	0.32	1.9	B	1.8	2200	J	690

Analysis:

		Benzo(a)pyrene (Method 8270)	Benzo(b)fluoranthene (Method 8270)	Benzo(ghi)perylene (Method 8270)	Bis (2-ethylhexyl)phthalate	Chrysene (Method 8270)	Fluoranthene (Method 8270)	Indeno(1,2,3-cd)pyrene (Method 8270)	Phenanthrene (Method 8270)	Pyrene (Method 8270)	Nitrogen in nitrate[a]	Sulfate	TPH-diesel range
TDL		660	660	660	660	660	660	660	660	660	0.75	5	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)		No-Stop (acceptable)
	RPD												
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 116-H-5 Waste Site

Sampling Area	HEIS Number	Sample Date	TPH-motor oil (high boiling) ug/kg	Q	PQL	TPH diesel range EXT ug/kg	Q	PQL
SPA-8	J19YJ4	5/17/10	40800		10100			
Duplicate of J19YJ4	J19YJ9	5/17/10	64900		10100			
SPA-4 re-sample 1[a]	J1FKM0	3/17/11				15000		1000
Duplicate of J1FKM0[a]	J1FKM9	3/17/11				5700		1000

Analysis:

		TPH-motor oil (high boiling)	TPH diesel range EXT
TDL		5000	5000
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)
	RPD	45.6%	
	Difference > 2 TDL?	Not applicable	No - acceptable

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	8400		18.1	0.907	UJ	0.907	4.27		0.907	67.8		0.453	0.263		0.181
Duplicate of J19YB9	J19YD0	5/18/10	7600		13.9	0.695	U	0.695	3.99		0.695	60.1		0.348	0.232		0.139
SZ-1	J19YB8	5/18/10	5270		14.8	0.742	UJ	0.742	2.13		0.742	33.6		0.371	0.130	B	0.148
SZ-3	J19YC0	5/18/10	7400		16.0	0.801	UJ	0.801	2.83		0.801	69.8		0.401	0.208		0.160
SZ-4	J19YC1	5/18/10	6340		18.0	0.902	UJ	0.902	5.32		0.902	51.9		0.451	0.172	B	0.180
SZ-5	J19YC2	5/18/10	6480		15.3	0.767	UJ	0.767	6.45		0.767	46.7		0.383	0.192		0.153
SZ-6	J19YC3	5/18/10	7240		16.7	0.837	UJ	0.837	3.75		0.837	63.4		0.418	0.216		0.167
SZ-7	J19YC4	5/18/10	7110		19.4	0.378	UJ	0.378	6.58		0.378	52.0		0.486	0.193	B	0.194
SZ-8	J19YC5	5/18/10	7120		15.1	0.28	UJ	0.753	4.84		0.753	62.2		0.377	0.206		0.151
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	6940		1.5	0.36	U	0.36	4.8		0.63	69.6		0.073	0.11	BM	0.032
SZ-10	J19YC7	5/18/10	6700		13.6	0.678	UJ	0.678	7.65		0.678	54.8		33.9	0.181		0.136
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	3790		1.4	0.33	U	0.33	1.1		0.58	43.0		0.066	0.029	U	0.029
SZ-12	J19YC9	5/18/10	6190		17.2	0.859	U	0.859	3.06		0.859	50.7		0.430	0.155	B	0.172
DZ-8 re-sample 2[a]	J1HH85	4/13/11	6430		1.4	0.35	U	0.35	6.0		0.60	43.4		0.069	0.12	B	0.030
Duplicate of J1HH85[a]	J1HH86	4/13/11	6810		1.5	0.37	U	0.37	6.7		0.64	42.1		0.074	0.13	B	0.032
DZ-1 re-sample 2[a]	J1HH80	4/13/11	6390		1.5	0.37	U	0.37	7.0		0.65	60.9		0.074	0.13	B	0.032
DZ-2 re-sample 2[a]	J1HH81	4/13/11	5580		1.4	0.35	U	0.35	2.5		0.61	57.7		0.070	0.063	B	0.031
DZ-3 re-sample 2[a]	J1HH82	4/13/11	6100		1.5	0.37	U	0.37	1.9		0.64	59.7		0.074	0.042	B	0.032
DZ-4 re-sample 2[a]	J1HH83	4/13/11	7380		1.5	0.36	U	0.36	4.8		0.63	68.3		0.073	0.16	B	0.032
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	5290		1.5	0.36	U	0.36	9.8		0.63	35.5		0.072	0.031	U	0.031
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	6310		1.4	0.34	U	0.34	1.8		0.59	50.3		0.068	0.030	U	0.030
DZ-7 re-sample 2[a]	J1HH84	4/13/11	5230		1.6	0.39	U	0.39	4.2		0.69	34.7		0.079	0.098	B	0.034
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	5210		1.5	0.36	U	0.36	1.1		0.62	77.1		0.072	0.031	U	0.031
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	5910		1.5	0.38	U	0.38	2.4		0.65	57.4		0.075	0.033	U	0.033
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	8980		1.6	0.39	U	0.39	2.8		0.67	69.0		0.077	0.074	B	0.034
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	6950		1.6	0.39	U	0.39	3.2		0.68	90.3		0.078	0.034	U	0.034

Footnotes apply to all calculations sheets and attachment 1.

[a] Location re-sampled due to RAG exceedance. All replaced data is shown in attachment 1 and is for information only. Re-sample strategy is further explained in the RSVP.

[b] Nitrate, nitrite, and phosphate were converted to nitrogen in nitrate, nitrogen in nitrite, and phosphorus in phosphate respectively.

Note: Data qualified with B, C, and/or J are considered acceptable values.

B = blank contamination (inorganic constituents)
C = </= 5x blank concentration
D = dilution
HEIS = Hanford Environmental Information System
J = estimate
M = duplicate precision not met.
N = recovery outside control limits

PQL = practical quantitation limit
Q = qualifier
R = rejected
U = undetected
X = >40% difference between primary and confirmation detector results.

Attachment	1	Sheet No.	1 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	1.22	B	1.81	0.227	U	0.227	4240		18.1	21.2		0.907	6.33		2.72
Duplicate of J19YB9	J19YD0	5/18/10	1.11	B	1.39	0.073	B	0.174	4040		13.9	15.9		0.695	5.42		2.09
SZ-1	J19YB8	5/18/10	0.759	B	1.48	0.041	B	0.186	6370		14.8	8.93		0.742	4.91		2.23
SZ-3	J19YC0	5/18/10	3.44		1.60	0.086	B	0.200	4940		16.0	12.7		0.801	5.79		2.40
SZ-4	J19YC1	5/18/10	1.26	B	1.80	0.065	B	0.225	5770		18.0	10.4		0.902	6.11		2.71
SZ-5	J19YC2	5/18/10	1.12	B	1.53	0.060	B	0.192	5310		15.3	11.0		0.767	5.45		2.30
SZ-6	J19YC3	5/18/10	1.26	B	1.67	0.059	B	0.209	5040		16.7	12.8		0.837	6.41		2.51
SZ-7	J19YC4	5/18/10	1.18	B	1.94	0.052	B	0.243	5590		19.4	11.7		0.971	5.82		2.91
SZ-8	J19YC5	5/18/10	1.34	B	1.51	0.101	B	0.188	4280		15.1	12.6		0.753	5.65		2.26
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	1.0	B	0.94	0.074	BM	0.039	5790		13.5	9.9	X	0.055	6.6	X	0.095
SZ-10	J19YC7	5/18/10	0.967	B	1.36	0.059	B	0.170	5340		13.6	10.2		0.678	5.6		2.04
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.86	U	0.86	0.070	B	0.036	4550		12.3	5.3	X	0.051	7.6	X	0.087
SZ-12	J19YC9	5/18/10	1.0	B	1.72	0.105	B	0.215	6020		17.2	13.1		0.859	5.38		2.58
DZ-8 re-sample 2[a]	J1HH85	4/13/11	0.90	U	0.90	0.14	B	0.037	5170		12.9	12.8		0.053	5.3	X	0.091
Duplicate of J1HH85[a]	J1HH86	4/13/11	0.95	U	0.95	0.19		0.040	4840		13.7	15.1		0.056	5.4	X	0.097
DZ-1 re-sample 2[a]	J1HH80	4/13/11	1.2	B	0.96	0.067	B	0.040	7110		13.8	9.8		0.057	6.2	X	0.098
DZ-2 re-sample 2[a]	J1HH81	4/13/11	0.91	U	0.91	0.046	B	0.038	3970		13.0	6.2		0.054	6.4	X	0.093
DZ-3 re-sample 2[a]	J1HH82	4/13/11	0.96	U	0.96	0.042	B	0.040	4730		13.8	15.1		0.057	6.6	X	0.098
DZ-4 re-sample 2[a]	J1HH83	4/13/11	0.94	U	0.94	0.081	B	0.039	5650		13.5	12.9		0.056	6.3	X	0.096
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	0.93	U	0.93	0.039	U	0.039	4840		13.4	7.6		0.055	5.1	X	0.095
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	0.88	U	0.88	0.052	B	0.037	4910		12.6	7.2		0.052	5.5	X	0.090
DZ-7 re-sample 2[a]	J1HH84	4/13/11	1.0	U	1.0	0.055	B	0.043	3580		14.6	8.8		0.060	4.7	X	0.10
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	0.93	U	0.93	0.039	U	0.039	3500		13.3	6.5		0.055	5.5	X	0.095
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	0.97	U	0.97	0.041	U	0.041	3860		14.0	8.7		0.057	5.7	X	0.099
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	1.0	U	1.0	0.042	U	0.042	5890		14.4	11.6		0.059	6.4	X	0.10
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	1.0	U	1.0	0.064	B	0.042	3920		14.5	8.3		0.060	6.7	X	0.10

Attachment	1	Sheet No.	2 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	12.5		1.81	0.23	U	0.23	21700		18.1	4.66		0.907	4670		4.53
Duplicate of J19YB9	J19YD0	5/18/10	11.4		1.39	0.21	U	0.21	18700		13.9	5.41		0.695	4110		3.48
SZ-1	J19YB8	5/18/10	12.2		1.48	0.06	B	0.21	14800		14.8	3.44		0.742	3840		3.71
SZ-3	J19YC0	5/18/10	13.1		1.60	0.20	U	0.20	18100		16.0	8.37		0.801	4500		4.01
SZ-4	J19YC1	5/18/10	16.1		1.80	0.21	U	0.21	17500		18.0	15.2		0.902	4070		4.51
SZ-5	J19YC2	5/18/10	13.0		1.53	0.21	U	0.21	17400		15.3	15.9		0.767	4190		3.83
SZ-6	J19YC3	5/18/10	12.8		1.67	0.21	U	0.21	20200		16.7	6.41		0.837	4140		4.18
SZ-7	J19YC4	5/18/10	13.3		1.94	0.21	U	0.21	17900		19.4	17.3		0.971	4300		4.86
SZ-8	J19YC5	5/18/10	12.0		1.51	0.21	U	0.21	18000		15.1	15.1		0.753	4010		3.77
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	17.3		0.21	0.145	U	0.145	15400	X	3.6	8.0		0.26	4420	X	3.5
SZ-10	J19YC7	5/18/10	14.3		1.36	0.21	U	0.21	17100		13.6	24.2		0.678	4050		3.39
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	14.5		0.19	0.146	U	0.146	18000	X	3.3	2.3		0.24	3720	X	3.2
SZ-12	J19YC9	5/18/10	12.5		1.72	0.21	U	0.21	16500		17.2	5.8		0.859	4650		4.30
DZ-8 re-sample 2[a]	J1HH85	4/13/11	18.5		0.20				14500		3.5	14.3	X	0.25	3940		3.4
DZ-8	J19YD8	5/18/10	11.9		1.93	0.21	U	0.21	15500		19.3	7.78		0.97	3270		4.83
Duplicate of J1HH85[a]	J1HH86	4/13/11	16.2		0.21				15100		3.7	17.3	X	0.26	4280		3.6
Duplicate of J19YD1	J19YF3	5/18/10	12.7		1.86	0.21	U	0.21	16200		18.6	14.3		0.93	3950		4.65
DZ-1 re-sample 2[a]	J1HH80	4/13/11	14.0		0.21				16600		3.7	18.5	X	0.26	4030		3.6
DZ-1	J19YD1	5/18/10	12.8		1.47	0.21	U	0.21	15500		14.7	12.5		0.74	3430		3.68
DZ-2 re-sample 2[a]	J1HH81	4/13/11	15.3		0.20				18500		3.5	4.2	X	0.25	3430		3.4
DZ-2	J19YD2	5/18/10	13.6		2.07	0.21	U	0.21	20400		20.7	7.09		1.03	4290		5.17
DZ-3 re-sample 2[a]	J1HH82	4/13/11	13.4		0.21				18200		3.7	2.9	X	0.26	4190		3.6
DZ-3	J19YD3	5/18/10	12.8		2.10	0.21	U	0.21	18600		21.0	7.83		1.05	4410		5.24
DZ-4 re-sample 2[a]	J1HH83	4/13/11	14.4		0.21				16800		3.6	11.4	X	0.26	4410		3.6
DZ-4	J19YD4	5/18/10	13.4		1.39	0.21	U	0.21	17500		13.9	13.1		0.70	4250		3.48
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	12.8		0.21				12800	X	3.6	31.3		0.26	3480		3.5
DZ-5	J19YD5	5/18/10	13.5		1.58	0.21	U	0.21	17800		15.8	58.2		0.79	4230		3.94
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	15.4		0.19				13900	X	3.4	8.4		0.24	3340		3.3
DZ-6	J19YD6	5/18/10	13.8		1.43	0.21	U	0.21	16500		14.3	15.5		0.71	4120		3.56
DZ-7 re-sample 2[a]	J1HH84	4/13/11	11.7		0.23				12500		3.9	11.3	X	0.28	3520		3.8
DZ-7	J19YD7	5/18/10	14.9		1.59	0.21	U	0.21	18300		15.9	22.8		0.79	4270		3.97
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	12.7		0.21				15300	X	3.6	3.5		0.26	3050		3.5
DZ-9	J19YD9	5/18/10	13.4		1.74	0.21	U	0.21	17800		17.4	14.4		0.87	4120		4.35
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	13.6		0.21				14800	X	3.8	6.0		0.27	3820		3.7
DZ-10	J19YF0	5/18/10	14.1		1.50	0.21	U	0.21	17000		15.0	12.7		0.75	3130		3.74
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	15.9		0.22				16000	X	3.9	8.4		0.27	4590		3.8
DZ-11	J19YF1	5/18/10	14.9		1.68	0.21	U	0.21	17400		16.8	15.8		0.84	3970		4.21
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	15.8		0.22				18800	X	3.9	9.8		0.28	3900		3.8
DZ-12	J19YF2	5/18/10	13.6		1.56	0.21	U	0.21	17000		15.6	14.7		0.78	4250		3.90

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	278		0.907	0.015	B	0.03	0.294	B	0.907	15.6		2.27	1200		90.7
Duplicate of J19YB9	J19YD0	5/18/10	256		0.695	0.027	U	0.027	0.243	B	0.695	12.2		1.74	1100		69.5
SZ-1	J19YB8	5/18/10	227		0.742	0.026	U	0.026	0.252	B	0.742	8.94		1.86	668		74.2
SZ-3	J19YC0	5/18/10	268		0.801	0.019	B	0.03	0.271	B	0.801	10.9		2.00	1600		80.1
SZ-4	J19YC1	5/18/10	257		0.902	0.026	U	0.026	0.276	B	0.902	9.84		2.25	921		90.2
SZ-5	J19YC2	5/18/10	263		0.767	0.024	U	0.24	0.233	B	0.767	10		1.92	868		76.7
SZ-6	J19YC3	5/18/10	274		0.837	0.018	B	0.03	0.321	B	0.837	10.8		2.09	1130		83.7
SZ-7	J19YC4	5/18/10	272		0.971	0.03	U	0.03	0.26	B	0.971	10		2.43	986		97.1
SZ-8	J19YC5	5/18/10	270		0.753	0.027	U	0.027	0.252	B	0.753	10.2		1.88	1210		75.3
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	284	X	0.095	0.0054	U	0.0054	0.25	U	0.25	11.1	X	0.12	853		39.1
SZ-10	J19YC7	5/18/10	266		0.678	0.011	B	0.02	0.25	B	0.678	9.63		1.70	884		67.8
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	234	X	0.087	0.0050	U	0.0050	0.23	U	0.23	11.5	X	0.11	425		35.8
SZ-12	J19YC9	5/18/10	251		0.859	0.027	U	0.027	0.298	B	0.859	12.5		2.15	642		85.9
DZ-8 re-sample 2[a]	J1HH85	4/13/11	221		0.091	0.019		0.0050	0.24	U	0.24	9.9	X	0.11	843		37.5
Duplicate of J1HH85[a]	J1HH86	4/13/11	228		0.097	0.020		0.0050	0.25	U	0.25	11.3	X	0.12	891		39.9
DZ-1 re-sample 2[a]	J1HH80	4/13/11	283		0.098	0.0055	U	0.0055	0.25	U	0.25	10.6	X	0.12	897		40.1
DZ-2 re-sample 2[a]	J1HH81	4/13/11	252		0.093	0.0051	U	0.0051	0.24	U	0.24	8.1	X	0.11	516		37.9
DZ-3 re-sample 2[a]	J1HH82	4/13/11	231		0.098	0.0053	U	0.0053	0.25	U	0.25	12.8	X	0.12	545		40.1
DZ-4 re-sample 2[a]	J1HH83	4/13/11	261		0.096	0.0057	U	0.0057	0.87	B	0.25	11.5	X	0.12	1050		39.4
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	209		0.095	0.0056	U	0.0056	0.25	U	0.25	10.1	X	0.12	711		39.0
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	217		0.090	0.0057	U	0.0057	0.23	U	0.23	9.2	X	0.11	573		36.7
DZ-7 re-sample 2[a]	J1HH84	4/13/11	206		0.10	0.0063	U	0.0063	0.27	U	0.27	12.2	X	0.13	634		42.6
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	219		0.095	0.0055	U	0.0055	0.25	U	0.25	6.8	X	0.12	542		38.8
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	230		0.099	0.0054	U	0.0054	0.26	U	0.26	9.2	X	0.12	577		40.6
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	260		0.10	0.0060	U	0.0060	0.26	U	0.26	13.5	X	0.13	1300		41.7
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	284		0.10	0.0052	U	0.0052	0.27	U	0.27	11.3	X	0.13	782		42.3

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.272	U	0.27	571		5.44	0.907	U	0.91	165		45.3	52.6		0.91
Duplicate of J19YB9	J19YD0	5/18/10	0.209	U	0.21	512		4.17	0.695	U	0.7	147		34.8	43.7		0.7
SZ-1	J19YB8	5/18/10	0.223	U	0.22	415		4.45	0.742	U	0.74	181		37.1	42.9		0.74
SZ-3	J19YC0	5/18/10	0.24	U	0.24	521		4.81	0.801	U	0.8	210		40.1	47		0.8
SZ-4	J19YC1	5/18/10	0.271	U	0.27	658		5.41	0.902	U	0.9	181		45.1	46.8		0.9
SZ-5	J19YC2	5/18/10	0.23	U	0.23	974		4.6	0.767	U	0.77	192		38.3	46.1		0.77
SZ-6	J19YC3	5/18/10	0.251	U	0.25	1000		5.02	0.837	U	0.84	214		41.8	52.8		0.84
SZ-7	J19YC4	5/18/10	0.291	U	0.29	1150		5.83	0.971	U	0.97	200		48.6	49.4		0.97
SZ-8	J19YC5	5/18/10	0.226	U	0.23	473		4.52	0.753	U	0.75	193		37.7	45.2		0.75
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.82	U	0.82	188		5.4	0.15	U	0.15	184		56.3	42.6		0.090
SZ-10	J19YC7	5/18/10	0.204	U	0.2	399		4.07	0.678	U	0.68	212		33.9	45.4		0.68
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.75	U	0.75	117		4.9	0.14	U	0.14	246		51.6	47.4		0.082
SZ-12	J19YC9	5/18/10	0.258	U	0.26	493		5.15	0.859	U	0.86	177		43	46.6		0.86
DZ-8 re-sample 2[a]	J1HH85	4/13/11	0.79	U	0.79	192		5.2	0.15	U	0.15	244		53.9	35.9		0.086
Duplicate of J1HH85[a]	J1HH86	4/13/11	0.84	U	0.84	219		5.5	0.16	U	0.16	236		57.4	37.1		0.091
DZ-1 re-sample 2[a]	J1HH80	4/13/11	0.84	U	0.84	241	N	5.5	0.16	U	0.16	236		57.7	40.3		0.092
DZ-2 re-sample 2[a]	J1HH81	4/13/11	0.80	U	0.80	131		5.2	0.15	U	0.15	323		54.6	48.7		0.087
DZ-3 re-sample 2[a]	J1HH82	4/13/11	0.84	U	0.84	126		5.5	0.16	U	0.16	320		57.6	56.4		0.092
DZ-4 re-sample 2[a]	J1HH83	4/13/11	0.83	U	0.83	352		5.4	0.15	U	0.15	257		56.6	41.9		0.090
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	0.82	U	0.82	174		5.4	0.15	U	0.15	215		56.1	33.6		0.089
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	0.77	U	0.77	174		5.1	0.14	U	0.14	388		52.9	39.4		0.084
DZ-7 re-sample 2[a]	J1HH84	4/13/11	0.89	U	0.89	245		5.9	0.17	U	0.17	163		61.3	30.5		0.098
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	0.81	U	0.81	112		5.4	0.15	U	0.15	285		55.8	47.9		0.089
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	0.85	U	0.85	169		5.6	0.16	U	0.16	281		58.4	35.4		0.093
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	0.88	U	0.88	200		5.8	0.16	U	0.16	300		60.0	40.9		0.096
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	0.89	U	0.89	209		5.8	0.17	U	0.17	270		60.9	54.7		0.097

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	37.8		2.72
Duplicate of J19YB9	J19YD0	5/18/10	33.9		2.09
SZ-1	J19YB8	5/18/10	29		2.23
SZ-3	J19YC0	5/18/10	68.7		2.4
SZ-4	J19YC1	5/18/10	38		2.71
SZ-5	J19YC2	5/18/10	33.4		2.3
SZ-6	J19YC3	5/18/10	39.2		2.51
SZ-7	J19YC4	5/18/10	35.8		2.91
SZ-8	J19YC5	5/18/10	69.8		2.26
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	35.2	X	0.38
SZ-10	J19YC7	5/18/10	34.8		2.04
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	34.3	X	0.35
SZ-12	J19YC9	5/18/10	35.5		2.58
DZ-8 re-sample 2[a]	J1HH85	4/13/11	60.8		0.36
Duplicate of J1HH85[a]	J1HH86	4/13/11	77.2		0.39
DZ-1 re-sample 2[a]	J1HH80	4/13/11	39.0		0.39
DZ-2 re-sample 2[a]	J1HH81	4/13/11	35.5		0.37
DZ-3 re-sample 2[a]	J1HH82	4/13/11	34.4		0.39
DZ-4 re-sample 2[a]	J1HH83	4/13/11	38.9		0.38
DZ-5 re-sample 1[a]	J1FKK5	3/16/11	27.4	X	0.38
DZ-6 re-sample 1[a]	J1FKK6	3/16/11	31.6	X	0.36
DZ-7 re-sample 2[a]	J1HH84	4/13/11	29.6		0.41
DZ-9 re-sample 1[a]	J1FKK9	3/16/11	30.9	X	0.38
DZ-10 re-sample 1[a]	J1FKL0	3/16/11	31.3	X	0.39
DZ-11 re-sample 1[a]	J1FKL1	3/16/11	44.7	X	0.41
DZ-12 re-sample 1[a]	J1FKL2	3/16/11	46.2	X	0.41

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	6390		16.3	0.344	B	0.813	4.95		0.813	51.4		0.407	0.162	B	0.163
Duplicate of J19YF8	J19YH6	5/13/10	6090		19.0	0.388	B	0.951	4.74		0.951	47.2		0.478	0.149	B	0.190
OB-1	J19YF4	5/13/10	6570		14.4	0.377	B	0.722	3.27		0.722	50.9		0.361	0.153		0.144
OB-2	J19YF5	5/13/10	6610		18.2	0.437	B	0.912	4.17		0.912	51.8		0.456	0.161	B	0.182
OB-3	J19YF6	5/13/10	6150		17.1	0.464	B	0.854	6.21		0.854	47.8		0.427	0.169	B	0.171
OB-4	J19YF7	5/13/10	6270		16.8	0.272	B	0.840	3.96		0.840	48.5		0.420	0.162	B	0.168
OB-6	J19YF9	5/13/10	6990		17.4	0.426	B	0.869	8.14		0.869	54.4		0.434	0.197		0.174
OB-7	J19YH0	5/13/10	5560		17.1	0.279	B	0.855	5.13		0.855	43.1		0.427	0.149	B	0.171
OB-8 re-sample 1[a]	J1FKL6	3/17/11	6320	X	1.5	0.37	U	0.37	6.5		0.63	49.8	X	0.073	0.12	B	0.032
OB-9	J19YH2	5/13/10	5590		15.5	0.773	U	0.773	3.59		0.773	48.7		0.386	0.136	B	0.155
OB-10	J19YH3	5/13/10	5600		18.7	0.309	B	0.933	4.77		0.933	37.8		0.466	0.14	B	0.187
OB-11	J19YH4	5/13/10	7240		17.1	0.491	B	0.854	6.82		0.854	67.6		0.427	0.208		0.171
OB-12	J19YH5	5/13/10	6330		15.5	0.469	B	0.776	5.29		0.776	46.4		0.388	0.175		0.155
OB-13	J1B4H9	5/17/10	6330		13.0	0.254	B	0.652	4.23		0.652	57.1		0.326	0.181		0.130
OB-14	J1B4J0	5/17/10	5690		15.4	0.772	U	0.772	4.75		0.772	46.2		0.386	0.147	B	0.154
OB-15	J1B4J1	5/17/10	6580		17.6	0.274	B	0.881	6.1		0.881	57.4		0.441	0.181		0.176
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	5420	X	1.4	0.33	U	0.33	1.7		0.58	32.9	X	0.067	0.085	B	0.029
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	5260	X	1.6	0.40	U	0.40	2.1		0.69	36.4	X	0.079	0.074	B	0.034
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	5400	X	1.4	0.34	U	0.34	2.2		0.59	36.4	X	0.067	0.089	B	0.029
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	5490	X	1.5	0.37	U	0.37	1.7		0.64	33.5	X	0.074	0.079	B	0.032
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	4220	X	1.3	0.33	U	0.33	1.5		0.57	37.3	X	0.066	0.069	B	0.029
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	6890	X	1.4	0.34	U	0.34	7.8		0.58	88.8	X	0.067	0.15	B	0.029
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	6790	X	1.4	0.34	U	0.34	9.1		0.59	60.5	X	0.068	0.15	B	0.030
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	8050	X	1.6	0.40	U	0.40	14.1		0.69	126	X	0.079	0.17	B	0.034
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	7710	X	1.6	0.40	U	0.40	6.7		0.70	68.3	X	0.080	0.10	B	0.035
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	9590	X	1.6	0.38	U	0.38	12.2		0.67	82.9	X	0.077	0.22		0.033
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	6210	X	1.5	0.37	U	0.37	3.4		0.65	40.6	X	0.075	0.047	B	0.032
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	4580	X	1.3	0.33	U	0.33	2.2		0.56	43.0	X	0.065	0.028	B	0.028
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	7770	X	1.4	0.34	U	0.34	14.2		0.59	72.5	X	0.068	0.16	B	0.030
Equipment Blank	J19YK0	5/17/10	153		14.9	0.743	U	0.74	0.254	B	0.74	1.76		0.37	0.149	U	0.15
Equipment Blank	J1FKN0	3/17/11	239	X	1.3	0.33	U	0.33	0.57	U	0.57	10.3	X	0.066	0.091	B	0.028
Equipment Blank	J1HH87	4/13/11	238		1.3	0.33	U	0.33	0.57	U	0.57	2.8		0.066	0.041	B	0.029

Attachment	1	Sheet No.	7 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	0.938	B	1.63	0.203	U	0.203	4560		16.3	10.4		0.813	5.41		2.44
Duplicate of J19YF8	J19YH6	5/13/10	0.842	B	1.90	0.238	U	0.238	4040		19.0	10.1		0.951	5.16		2.85
OB-1	J19YF4	5/13/10	0.853	B	1.44	0.180	U	0.180	4160		14.4	13.2		0.722	5.37		2.17
OB-2	J19YF5	5/13/10	0.958	B	1.82	0.054	B	0.228	4630		18.2	11.4		0.912	5.34		2.74
OB-3	J19YF6	5/13/10	0.916	B	1.71	0.213	U	0.213	5800		17.1	10.7		0.854	5.52		2.56
OB-4	J19YF7	5/13/10	0.902	B	1.68	0.210	U	0.210	4410		16.8	11.7		0.840	5.15		2.52
OB-6	J19YF9	5/13/10	1.17	B	1.74	0.07	B	0.217	5210		17.4	11.7		0.869	5.8		2.61
OB-7	J19YH0	5/13/10	0.805	B	1.71	0.084	B	0.214	4150		17.1	9.84		0.855	4.93		2.56
OB-8 re-sample 1[a]	J1FKL6	3/17/11	1.3	B	0.94	0.064	B	0.039	5160	X	13.6	10.6	X	0.056	6.1	X	0.096
OB-9	J19YH2	5/13/10	0.752	B	1.55	0.193	U	0.193	4190		15.5	9.58		0.773	4.95		2.32
OB-10	J19YH3	5/13/10	0.843	B	1.87	0.233	U	0.233	5630		18.7	9.93		0.933	5.27		2.80
OB-11	J19YH4	5/13/10	1.34	B	1.71	0.064	B	0.214	5250		17.1	12.8		0.854	5.88		2.56
OB-12	J19YH5	5/13/10	1.15	B	1.55	0.039	B	0.194	5470		15.5	11.7		0.776	5.39		2.33
OB-13	J1B4H9	5/17/10	2.55		1.30	0.068	B	0.163	5530		13.0	10.3		0.652	5.36		1.96
OB-14	J1B4J0	5/17/10	1.70		1.54	0.042	B	0.193	5670		15.4	11		0.772	4.92		2.32
OB-15	J1B4J1	5/17/10	2.02		1.76	0.057	B	0.220	5740		17.6	11.1		0.881	5.9		2.64
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.86	U	0.86	0.054	B	0.036	5790	X	12.4	8.8	X	0.051	4.9	X	0.088
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	1.0	U	1.0	0.079	B	0.043	5660	X	14.7	9.6	X	0.060	5.1	X	0.10
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.88	B	0.87	0.043	B	0.036	5780	X	12.5	9.2	X	0.051	4.9	X	0.089
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.95	U	0.95	0.049	B	0.040	5380	X	13.7	9.4	X	0.056	5.2	X	0.097
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.85	U	0.85	0.077	B	0.036	4860	X	12.2	6.1	X	0.050	4.5	X	0.087
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	6.9		0.87	0.15	B	0.036	5800	X	12.4	11.0	X	0.051	6.3	X	0.088
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	2.1		0.88	0.11	B	0.037	4130	X	12.7	9.6	X	0.052	6.0	X	0.090
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	1.7	B	1.0	0.12	B	0.043	5220	X	14.7	11.9	X	0.061	7.2	X	0.10
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	1.2	B	1.0	0.10	B	0.043	12100	X	14.9	10.5	X	0.061	7.2	X	0.11
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	1.4	B	0.99	0.14	B	0.041	4170	X	14.2	13.1	X	0.058	7.9	X	0.10
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.96	U	0.96	0.059	B	0.040	4320	X	13.9	9.4	X	0.057	6.7	X	0.098
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.84	U	0.84	0.077	B	0.035	4910	X	12.1	9.4	X	0.050	6.8	X	0.086
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	1.8		0.88	0.12	B	0.037	4960	X	12.7	11.6	X	0.052	6.8	X	0.090
Equipment Blank	J19YK0	5/17/10	1.49	U	1.49	0.186	U	0.19	29.6		14.9	0.18	B	0.74	2.23	U	2.23
Equipment Blank	J1FKN0	3/17/11	0.9	U	0.85	0.035	U	0.035	56.6	XC	12.2	0.29	X	0.050	1.4	X	0.086
Equipment Blank	J1HH87	4/13/11	0.85	U	0.85	0.036	U	0.036	62.3		12.3	0.22	C	0.050	0.1	BX	0.087

Attachment	1	Sheet No.	8 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	12.7		1.63	0.20	U	0.20	16200		16.3	13.1		0.813	4170		4.07
Duplicate of J19YF8	J19YH6	5/13/10	12.7		1.90	0.16	B	0.20	15800		19.0	13.0		0.951	4130		4.76
OB-1	J19YF4	5/13/10	13.5		1.44	0.15	B	0.20	16600		14.4	6.95		0.722	4520		3.61
OB-2	J19YF5	5/13/10	14.3		1.82	0.11	B	0.20	16700		18.2	10.3		0.912	4360		4.56
OB-3	J19YF6	5/13/10	13.5		1.71	0.18	B	0.20	17100		17.1	17.6		0.854	4020		4.27
OB-4	J19YF7	5/13/10	13.8		1.68	0.15	B	0.20	16400		16.8	7.44		0.840	4250		4.20
OB-6	J19YF9	5/13/10	13.2		1.74	0.14	B	0.20	18000		17.4	25.2		0.869	4020		4.34
OB-7	J19YH0	5/13/10	13.4		1.71	0.20	B	0.20	14600		17.1	16.8		0.855	3530		4.27
OB-8 re-sample 1[a]	J1FKL6	3/17/11	13.6		0.21	0.184		0.154	15500	X	3.7	17.9	X	0.26	3990	X	3.6
OB-9	J19YH2	5/13/10	11.7		1.55	0.12	B	0.20	15300		15.5	8.91		0.773	3670		3.86
OB-10	J19YH3	5/13/10	12.4		1.87	0.17	B	0.20	14300		18.7	11.3		0.933	3790		4.66
OB-11	J19YH4	5/13/10	14.5		1.71	0.15	B	0.20	17600		17.1	22.4		0.854	4120		4.27
OB-12	J19YH5	5/13/10	13.4		1.55	0.11	B	0.20	16500		15.5	14.0		0.776	4300		3.88
OB-13	J1B4H9	5/17/10	12.9		1.30	0.20	U	0.20	16800		13	10.5		0.652	3750		3.26
OB-14	J1B4J0	5/17/10	12.2		1.54	0.20	U	0.20	15300		15.4	12.3		0.772	3440		3.86
OB-15	J1B4J1	5/17/10	13.6		1.76	0.20	U	0.20	17200		17.6	14.3		0.881	4000		4.41
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	12.3		0.19	0.154	U	0.154	12900	X	3.3	2.7	X	0.24	3760	X	3.3
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	11.4		0.23	0.154	U	0.154	13100	X	4.0	2.4	X	0.28	4040	X	3.8
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	11.3		0.19	0.154	U	0.154	13000	X	3.4	2.0	X	0.24	3940	X	3.3
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	12.1		0.21	0.154	U	0.154	13400	X	3.7	2.1	X	0.26	4010	X	3.6
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	12.5		0.19	0.151	U	0.151	11300	X	3.3	2.3	X	0.23	2900	X	3.2
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	15.9		0.19	0.153	U	0.153	15600	X	3.4	30.7	X	0.24	4310	X	3.3
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	13.5		0.19	0.155	U	0.155	15000	X	3.4	35.3	X	0.24	3760	X	3.3
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	15.6		0.23	0.153	U	0.153	19000	X	4.0	70.5	X	0.28	4260	X	3.9
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	17.0		0.23	0.154	U	0.154	20400	X	4.0	20.0	X	0.29	4790	X	3.9
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	14.9		0.22	0.154	U	0.154	19900	X	3.8	32.7	X	0.27	4600	X	3.7
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	14.0		0.21	0.154	U	0.154	17700	X	3.7	5.5	X	0.27	3650	X	3.6
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	12.9		0.19	0.154	U	0.154	18100	X	3.3	2.3	X	0.23	3370	X	3.2
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	14.0		0.20	0.154	U	0.154	18000	X	3.4	58.5	X	0.24	4100	X	3.3
Equipment Blank	J19YK0	5/17/10	1.49	U	1.49				240		14.9	0.426	B	0.74	18.4		3.71
Equipment Blank	J1FKN0	3/17/11	0.33	B	0.19				1920	X	3.3	1.5	X	0.23	29.6	X	3.2
Equipment Blank	J1HH87	4/13/11	0.19	B	0.19				465		3.3	0.41	BX	0.23	35.1		3.2

Attachment	1	Sheet No.	9 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	250		0.813	0.024	U	0.024	0.200	B	0.813	11.1		2.03	819		81.3
Duplicate of J19YF8	J19YH6	5/13/10	239		0.951	0.028	U	0.028	0.951	U	0.951	10.6		2.38	742		95.1
OB-1	J19YF4	5/13/10	266		0.722	0.025	U	0.025	0.250	B	0.722	10.9		1.80	741		72.2
OB-2	J19YF5	5/13/10	259		0.912	0.028	U	0.028	0.352	B	0.912	11.0		2.28	822		91.2
OB-3	J19YF6	5/13/10	251		0.854	0.025	U	0.025	0.232	B	0.854	10.1		2.13	970		85.4
OB-4	J19YF7	5/13/10	256		0.840	0.025	U	0.025	0.276	B	0.840	10.5		2.10	782		84.0
OB-6	J19YF9	5/13/10	272		0.869	0.025	U	0.025	0.313	B	0.869	9.82		2.17	1240		86.9
OB-7	J19YH0	5/13/10	220		0.855	0.026	U	0.026	0.227	B	0.855	9.49		2.14	807		85.5
OB-8 re-sample 1[a]	J1FKL6	3/17/11	253	X	0.096	0.0053	U	0.0053	0.25	U	0.25	10.3	X	0.12	917		39.4
OB-9	J19YH2	5/13/10	224		0.773	0.028	U	0.028	0.167	B	0.773	8.89		1.93	762		77.3
OB-10	J19YH3	5/13/10	244		0.933	0.026	U	0.026	0.933	U	0.933	9.11		2.33	770		93.3
OB-11	J19YH4	5/13/10	276		0.854	0.025	U	0.025	0.199	B	0.854	11.6		2.14	1280		85.4
OB-12	J19YH5	5/13/10	248		0.776	0.028	U	0.028	0.209	B	0.776	11.9		1.94	973		77.6
OB-13	J1B4H9	5/17/10	250		0.652	0.026	U	0.026	0.272	B	0.652	9.50		1.63	1050		65.2
OB-14	J1B4J0	5/17/10	227		0.772	0.026	U	0.026	0.308	B	0.772	9.29		1.93	955		77.2
OB-15	J1B4J1	5/17/10	262		0.881	0.023	U	0.023	0.289	B	0.881	11.8		2.2	1080		88.1
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	222	X	0.088	0.0054	U	0.0054	0.23	U	0.23	8.3	X	0.11	601		36.1
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	225	X	0.10	0.0052	U	0.0052	0.27	U	0.27	10.3	X	0.13	689		42.6
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	218	X	0.089	0.0056	U	0.0056	0.23	U	0.23	9.4	X	0.11	650		36.4
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	231	X	0.097	0.0056	U	0.0056	0.25	U	0.25	10.5	X	0.12	612		39.8
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	182	X	0.087	0.0058	U	0.0058	0.23	U	0.23	7.0	X	0.11	487		35.5
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	254	X	0.088	0.013	B	0.0056	0.33	B	0.23	10.8	X	0.11	1150		36.2
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	252	X	0.090	0.0080	B	0.0057	0.23	U	0.23	9.5	X	0.11	1180		36.8
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	300	X	0.10	0.0083	B	0.0060	0.27	U	0.27	11.2	X	0.13	1430		42.8
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	286	X	0.11	0.014	B	0.0056	0.28	U	0.28	9.7	X	0.13	1190		43.4
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	362	X	0.10	0.0053	U	0.0053	0.26	U	0.26	12.8	X	0.12	1750		41.3
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	230	X	0.098	0.0054	U	0.0054	0.26	U	0.26	10.2	X	0.12	638		40.3
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	241	X	0.086	0.0057	U	0.0057	0.22	U	0.22	8.0	X	0.11	509		35.1
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	294	X	0.090	0.011	BN	0.0054	0.23	U	0.23	10.6	X	0.11	1310		36.9
Equipment Blank	J19YK0	5/17/10	4.5		0.74	0.025	U	0.025	0.743	U	0.743	1.86	U	1.86	47	B	74.3
Equipment Blank	J1FKN0	3/17/11	111	X	0.086	0.0054	U	0.0054	0.22	U	0.22	0.40	BX	0.11	58.7	B	35.4
Equipment Blank	J1HH87	4/13/11	4.9		0.087	0.0053	U	0.0053	0.23	U	0.23	0.22	BX	0.11	57.3	B	35.7

Attachment	1	Sheet No.	10 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	0.244	U	0.244	172		4.88	0.813	U	0.813	190		40.7	42.5		0.813
Duplicate of J19YF8	J19YH6	5/13/10	0.285	U	0.285	196		5.71	0.951	U	0.951	190		47.6	39.5		0.951
OB-1	J19YF4	5/13/10	0.217	U	0.217	136		4.33	0.722	U	0.722	206		36.1	41.7		0.722
OB-2	J19YF5	5/13/10	0.274	U	0.274	213		5.47	0.912	U	0.912	191		45.6	46.4		0.912
OB-3	J19YF6	5/13/10	0.256	U	0.256	188		5.12	0.854	U	0.854	182		42.7	45.3		0.854
OB-4	J19YF7	5/13/10	0.252	U	0.252	187		5.04	0.840	U	0.840	174		42.0	43.6		0.840
OB-6	J19YF9	5/13/10	0.261	U	0.261	181		5.21	0.869	U	0.869	201		43.4	46.5		0.869
OB-7	J19YH0	5/13/10	0.256	U	0.256	177		5.13	0.855	U	0.855	163		42.7	38.8		0.855
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.83	U	0.83	224	N	5.4	0.15	U	0.15	235		56.7	42.1		0.090
OB-9	J19YH2	5/13/10	0.232	U	0.232	161		4.64	0.773	U	0.773	159		38.6	41.5		0.773
OB-10	J19YH3	5/13/10	0.280	U	0.280	200		5.6	0.933	U	0.933	180		46.6	39.4		0.933
OB-11	J19YH4	5/13/10	0.256	U	0.256	163		5.13	0.854	U	0.854	172		42.7	45.5		0.854
OB-12	J19YH5	5/13/10	0.233	U	0.233	178		4.66	0.776	U	0.776	178		38.8	44.8		0.776
OB-13	J1B4H9	5/17/10	0.196	U	0.196	470		3.91	0.138	B	0.652	187		32.6	45.1		0.652
OB-14	J1B4J0	5/17/10	0.232	U	0.232	434		4.63	0.156	B	0.772	173		38.6	42.1		0.772
OB-15	J1B4J1	5/17/10	0.264	U	0.264	501		5.29	0.881	U	0.881	220		44.1	44.9		0.881
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.76	U	0.76	164	N	5.0	0.14	U	0.14	185		52.0	35.8		0.083
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.89	U	0.89	195	N	5.9	0.17	U	0.17	203		61.4	38.0		0.098
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.76	U	0.76	153	N	5.0	0.14	U	0.14	190		52.3	36.8		0.083
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.83	U	0.83	154	N	5.5	0.16	U	0.16	180		57.3	38.4		0.091
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.75	U	0.75	144	N	4.9	0.14	U	0.14	184		51.2	36.4		0.081
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.76	U	0.76	306	N	5.0	0.14	U	0.14	287		52.1	41.1		0.083
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.77	U	0.77	246	N	5.1	0.14	U	0.14	190		53.0	36.1		0.084
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.90	U	0.90	269	N	5.9	0.17	U	0.17	226		61.6	46.4		0.098
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.91	U	0.91	221	N	6.0	0.17	U	0.17	292		62.4	59.2		0.099
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.87	U	0.87	359	N	5.7	0.16	U	0.16	230		59.5	45.4		0.095
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.85	U	0.85	190	N	5.6	0.16	U	0.16	315		58.0	49.8		0.092
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.74	U	0.74	167	N	4.8	0.14	U	0.14	268		50.5	53.3		0.080
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.77	U	0.77	242	N	5.1	0.14	U	0.14	208		53.1	45.8		0.085
Equipment Blank	J19YK0	5/17/10	0.223	U	0.22	171		4.46	0.743	U	0.743	37.1	U	37.1	0.27	B	0.74
Equipment Blank	J1FKN0	3/17/11	0.74	U	0.74	90.8	N	4.9	0.14	U	0.14	50.9	U	50.9	0.69	B	0.081
Equipment Blank	J1HH87	4/13/11	0.75	U	0.75	119		4.9	0.14	U	0.14	51.3	U	51.3	0.87	B	0.082

Attachment	1	Sheet No.	11 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	32.2		2.44
Duplicate of J19YF8	J19YH6	5/13/10	31.2		2.85
OB-1	J19YF4	5/13/10	32.8		2.17
OB-2	J19YF5	5/13/10	41.2		2.74
OB-3	J19YF6	5/13/10	33.3		2.56
OB-4	J19YF7	5/13/10	33.2		2.52
OB-6	J19YF9	5/13/10	39.0		2.61
OB-7	J19YH0	5/13/10	55.3		2.56
OB-8 re-sample 1[a]	J1FKL6	3/17/11	34.3	X	0.38
OB-9	J19YH2	5/13/10	30.1		2.32
OB-10	J19YH3	5/13/10	29.4		2.80
OB-11	J19YH4	5/13/10	44.4		2.56
OB-12	J19YH5	5/13/10	33.1		2.33
OB-13	J1B4H9	5/17/10	59.6		1.96
OB-14	J1B4J0	5/17/10	37.0		2.32
OB-15	J1B4J1	5/17/10	49.4		2.64
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	28.4	X	0.35
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	28.1	X	0.41
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	26.4	X	0.35
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	27.9	X	0.39
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	25.7	X	0.35
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	40.6	X	0.35
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	36.4	X	0.36
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	44.8	X	0.42
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	44.6	X	0.42
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	48.6	X	0.40
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	32.8	X	0.39
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	32.9	X	0.34
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	43.5	X	0.36
Equipment Blank	J19YK0	5/17/10	2.23	U	2.23
Equipment Blank	J1FKN0	3/17/11	4.8	X	0.34
Equipment Blank	J1HH87	4/13/11	1.4	C	0.35

Attachment	1	Sheet No.	12 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	7010		19.9	0.993	UJ	0.993	6.51		0.993	54.7		0.50	0.203		0.200
SZ-11	J19YC8	5/18/10	7590		19.2	0.960	U	0.960	4.69		0.960	72.2		0.48	0.235		0.190
DZ-8	J19YD8	5/18/10	5390		19.3	0.967	UJ	0.967	3.23		0.967	56.6		0.48	0.147	B	0.190
DZ-8 re-sample 1	J1FKK8	3/16/11	6320		1.5	0.370	U	0.370	5.70		0.64	42.3		0.074	0.032	U	0.032
DZ-1	J19YD1	5/18/10	5570		14.7	0.737	UJ	0.737	4.46		0.737	42.1		0.37	0.164		0.150
DZ-1 re-sample 1	J1FKK1	3/16/11	6490		1.4	0.350	U	0.350	4.40		0.60	47.2		0.069	0.030	U	0.030
DZ-2	J19YD2	5/18/10	5380		20.7	1.03	UJ	1.03	3.41		1.03	67.9		0.52	0.147	B	0.210
DZ-2 re-sample 1	J1FKK2	3/16/11	5760		1.6	0.390	U	0.390	4.40		0.67	57.6		0.078	0.034	U	0.034
DZ-3	J19YD3	5/18/10	6880		21.0	1.05	UJ	1.05	3.95		1.05	61.4		0.52	0.200	B	0.210
DZ-3 re-sample 1	J1FKK3	3/16/11	8880		1.7	0.420	U	0.420	4.50		0.72	72.5		0.083	0.15	B	0.036
DZ-4	J19YD4	5/18/10	6780		13.9	0.696	UJ	0.696	5.30		0.696	60.8		0.35	0.185		0.140
DZ-4 re-sample 1	J1FKK4	3/16/11	5760		1.5	0.380	U	0.380	2.00		0.66	60.4		0.076	0.033	U	0.033
DZ-5	J19YD5	5/18/10	7410		15.8	0.788	UJ	0.788	17.7		0.788	57.6		0.39	0.211		0.160
DZ-6	J19YD6	5/18/10	6400		14.3	0.262	JB	0.713	5.99		0.713	47.7		0.36	0.176		0.140
DZ-7	J19YD7	5/18/10	7710		15.9	0.453	JB	0.794	8.10		0.794	57.1		0.40	0.199		0.160
DZ-7 re-sample 1	J1FKK7	3/16/11	6340		1.5	0.370	U	0.370	7.80		0.64	44.4		0.074	0.046	B	0.032
DZ-9	J19YD9	5/18/10	5790		17.4	0.870	UJ	0.870	5.10		0.870	50.7		0.44	0.174		0.170
DZ-10	J19YF0	5/18/10	5250		15.0	0.748	UJ	0.748	4.68		0.748	59.7		0.37	0.157		0.150
DZ-11	J19YF1	5/18/10	6470		16.8	0.842	U	0.842	5.85		0.842	58.2		0.42	0.191		0.170
DZ-12	J19YF2	5/18/10	6360		15.6	0.780	U	0.780	5.39		0.780	51.9		0.39	0.179		0.160
Duplicate of J19YD1	J19YF3	5/18/10	5830		18.6	0.929	U	0.929	5.30		0.929	45.4		0.47	0.164	B	0.190
Duplicate of J1FKK8	J1FKL3	3/16/11	6330		1.5	0.370	U	0.370	6.10		0.64	41.3		0.074	0.032	B	0.032
OB-8	J19YH1	5/13/10	6530		19.1	0.454	B	0.953	8.03		0.953	50		0.48	0.181	B	0.190
SPA-8	J19YJ4	5/17/10	7140		13.3	0.346	B	0.663	7.32		0.663	66.8		0.33	0.210		0.130
Duplicate of J19YJ4	J19YJ9	5/17/10	7420		16.3	0.813	U	0.813	7.94		0.813	69.3		0.41	0.229		0.160
SPA-1	J19YH7	5/17/10	5600		17.0	0.297	B	0.850	2.41		0.850	42.1		0.43	0.142	B	0.170
SPA-2	J19YH8	5/17/10	9000		14.3	0.290	B	0.717	4.14		0.717	75.1		0.36	0.269		0.140
SPA-3	J19YH9	5/17/10	9700		16.2	0.331	B	0.811	4.38		0.811	84		0.41	0.293		0.160
SPA-4	J19YJ0	5/17/10	6850		12.9	0.288	B	0.644	2.53		0.644	54.6		0.32	0.181		0.130
SPA-5	J19YJ1	5/17/10	8470		16.2	0.286	B	0.810	4.07		0.810	74.4		0.41	0.260		0.160
SPA-6	J19YJ2	5/17/10	6710		15.5	0.334	B	0.776	5.25		0.776	82.3		0.39	0.226		0.160
SPA-7	J19YJ3	5/17/10	7450		15.0	0.329	B	0.748	6.25		0.748	63.2		0.37	0.196		0.150
SPA-9	J19YJ5	5/17/10	7060		12.6	0.281	B	0.628	6.11		0.628	76.8		0.31	0.216		0.130
SPA-10	J19YJ6	5/17/10	6080		14.0	0.253	B	0.699	5.96		0.699	77.5		0.35	0.190		0.140
SPA-11	J19YJ7	5/17/10	7710		14.0	0.393	B	0.701	8.71		0.701	66.7		0.35	0.227		0.140
SPA-12	J19YJ8	5/17/10	7290		12.7	0.299	B	0.636	14.2		0.636	69.5		0.32	0.218		0.130

Attachment	1	Sheet No.	13 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	1.86	B	1.99	0.059	B	0.248	5670		19.9	10.9		0.993	5.75		2.98
SZ-11	J19YC8	5/18/10	2.92		1.92	0.098	B	0.240	5990		19.2	15.1		0.960	5.96		2.88
DZ-8	J19YD8	5/18/10	0.888	B	1.93	0.065	B	0.242	4450		19.3	8.55		0.967	4.97		2.90
DZ-8 re-sample 1	J1FKK8	3/16/11	0.95	U	0.95	0.040	U	0.040	4240		13.7	9.70		0.056	4.90	X	0.097
DZ-1	J19YD1	5/18/10	1.10	B	1.47	0.057	B	0.184	5100		14.7	8.71		0.737	5.03		2.21
DZ-1 re-sample 1	J1FKK1	3/16/11	0.89	U	0.89	0.037	U	0.037	4820		12.9	11.2		0.053	6.40	X	0.091
DZ-2	J19YD2	5/18/10	0.801	B	2.07	0.088	B	0.258	5120		20.7	10.7		1.03	7.58		3.1
DZ-2 re-sample 1	J1FKK2	3/16/11	1.00	U	1.00	0.042	U	0.042	4620		14.4	9.10		0.059	5.50	X	0.10
DZ-3	J19YD3	5/18/10	1.60	B	2.10	0.262	U	0.262	5660		21.0	15.6		1.05	5.96		3.15
DZ-3 re-sample 1	J1FKK3	3/16/11	1.10	U	1.10	0.045	U	0.045	6540		15.5	16.3		0.064	6.10	X	0.11
DZ-4	J19YD4	5/18/10	1.44		1.39	0.061	B	0.174	6420		13.9	11.5		0.696	5.77		2.09
DZ-4 re-sample 1	J1FKK4	3/16/11	0.98	U	0.98	0.041	U	0.041	4220		14.1	11.5		0.058	5.80	X	0.10
DZ-5	J19YD5	5/18/10	1.22	B	1.58	0.069	B	0.197	5060		15.8	11.3		0.788	5.80		2.36
DZ-6	J19YD6	5/18/10	1.08	B	1.43	0.048	B	0.178	5340		14.3	11.1		0.713	5.47		2.14
DZ-7	J19YD7	5/18/10	1.46	B	1.59	0.13	B	0.198	7540		15.9	19.9		0.794	5.88		2.38
DZ-7 re-sample 1	J1FKK7	3/16/11	0.95	U	0.95	0.040	U	0.040	4180		13.7	9.00		0.056	4.80	X	0.097
DZ-9	J19YD9	5/18/10	1.25	B	1.74	0.058	B	0.218	4660		17.4	9.92		0.870	5.87		2.61
DZ-10	J19YF0	5/18/10	0.902	B	1.50	0.055	B	0.187	4590		15.0	7.37		0.748	6.19		2.25
DZ-11	J19YF1	5/18/10	1.18	B	1.68	0.132	B	0.210	5760		16.8	12		0.842	5.35		2.53
DZ-12	J19YF2	5/18/10	1.07	B	1.56	0.115	B	0.195	5590		15.6	10.3		0.780	5.36		2.34
Duplicate of J19YD1	J19YF3	5/18/10	1.15	B	1.86	0.097	B	0.232	5360		18.6	9.56		0.929	5.58		2.79
Duplicate of J1FKK8	J1FKL3	3/16/11	0.96	U	0.96	0.040	U	0.040	4630		13.8	9.20		0.057	5.10	X	0.098
OB-8	J19YH1	5/13/10	1.07	B	1.91	0.238	U	0.238	5740		19.1	10.9		0.953	5.79		2.86
SPA-8	J19YJ4	5/17/10	3.26		1.33	0.082	B	0.166	4390		13.3	11.2		0.663	5.67		1.99
Duplicate of J19YJ4	J19YJ9	5/17/10	3.47		1.63	0.092	B	0.203	4500		16.3	11.1		0.813	5.96		2.44
SPA-1	J19YH7	5/17/10	1.26	B	1.70	0.212	U	0.212	6170		17.0	9.89		0.850	4.98		2.55
SPA-2	J19YH8	5/17/10	2.11		1.43	0.050	B	0.179	4580		14.3	12.3		0.717	6.44		2.15
SPA-3	J19YH9	5/17/10	2.25		1.62	0.050	B	0.203	4270		16.2	12.2		0.811	6.86		2.43
SPA-4	J19YJ0	5/17/10	1.31		1.29	0.035	B	0.161	4450		12.9	10.7		0.644	5.44		1.93
SPA-5	J19YJ1	5/17/10	2.16		1.62	0.056	B	0.202	3700		16.2	11.1		0.810	6.09		2.43
SPA-6	J19YJ2	5/17/10	6.47		1.55	0.141	B	0.194	4690		15.5	10.1		0.776	5.34		2.33
SPA-7	J19YJ3	5/17/10	2.55		1.50	0.051	B	0.187	6240		15.0	13		0.748	5.83		2.24
SPA-9	J19YJ5	5/17/10	4.16		1.26	0.104	B	0.157	4430		12.6	11.5		0.628	5.70		1.88
SPA-10	J19YJ6	5/17/10	4.84		1.40	0.105	B	0.175	3950		14.0	10.1		0.699	4.84		2.10
SPA-11	J19YJ7	5/17/10	3.03		1.40	0.083	B	0.175	4480		14.0	11.7		0.701	5.87		2.10
SPA-12	J19YJ8	5/17/10	3.32		1.27	0.091	B	0.159	5100		12.7	11.3		0.636	6.05		1.91

Attachment	1	Sheet No.	14 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	13.3		1.99	0.21	U	0.21	17300		19.9	19.3		0.993	4230		4.97
SZ-11	J19YC8	5/18/10	12.2		1.92	0.21	U	0.21	17900		19.2	7.84		0.960	5260		4.80
DZ-8	J19YD8	5/18/10	11.9		1.93	0.21	U	0.21	15500		19.3	7.78		0.967	3270		4.83
DZ-8 re-sample 1	J1FKK8	3/16/11	12.4		0.21				13100	X	3.70	19.4		0.26	3750		3.60
DZ-1	J19YD1	5/18/10	12.8		1.47	0.21	U	0.21	15500		14.7	12.5		0.737	3430		3.68
DZ-1 re-sample 1	J1FKK1	3/16/11	13.1		0.20				13900	X	3.50	11.7		0.25	4220		3.40
DZ-2	J19YD2	5/18/10	13.6		2.07	0.21	U	0.21	20400		20.7	7.09		1.03	4290		5.17
DZ-2 re-sample 1	J1FKK2	3/16/11	13.5		0.22				14700	X	3.90	12.1		0.28	3630		3.80
DZ-3	J19YD3	5/18/10	12.8		2.10	0.21	U	0.21	18600		21.0	7.83		1.05	4410		5.24
DZ-3 re-sample 1	J1FKK3	3/16/11	13.9		0.24				15500	X	4.20	10.5		0.30	5360		4.10
DZ-4	J19YD4	5/18/10	13.4		1.39	0.21	U	0.21	17500		13.9	13.1		0.696	4250		3.48
DZ-4 re-sample 1	J1FKK4	3/16/11	14.6		0.22				15300	X	3.80	7.40		0.27	3690		3.70
DZ-5	J19YD5	5/18/10	13.5		1.58	0.21	U	0.21	17800		15.8	58.2		0.788	4230		3.94
DZ-6	J19YD6	5/18/10	13.8		1.43	0.21	U	0.21	16500		14.3	15.5		0.713	4120		3.56
DZ-7	J19YD7	5/18/10	14.9		1.59	0.21	U	0.21	18300		15.9	22.8		0.794	4270		3.97
DZ-7 re-sample 1	J1FKK7	3/16/11	12.4		0.21				13200	X	3.70	24.5		0.26	3850		3.60
DZ-9	J19YD9	5/18/10	13.4		1.74	0.21	U	0.21	17800		17.4	14.4		0.870	4120		4.35
DZ-10	J19YF0	5/18/10	14.1		1.50	0.21	U	0.21	17000		15.0	12.7		0.748	3130		3.74
DZ-11	J19YF1	5/18/10	14.9		1.68	0.21	U	0.21	17400		16.8	15.8		0.842	3970		4.21
DZ-12	J19YF2	5/18/10	13.6		1.56	0.21	U	0.21	17000		15.6	14.7		0.780	4250		3.90
Duplicate of J19YD1	J19YF3	5/18/10	12.7		1.86	0.21	U	0.21	16200		18.6	14.3		0.929	3950		4.65
Duplicate of J1FKK8	J1FKL3	3/16/11	11.7		0.21				13100	X	3.70	22.7		0.26	4020		3.6
OB-8	J19YH1	5/13/10	15		1.91	0.08	B	0.20	17400		19.1	23.9		0.953	4230		4.77
SPA-8	J19YJ4	5/17/10	13.6		1.33	0.20	U	0.20	17300		13.3	56.5		0.663	3910		3.32
Duplicate of J19YJ4	J19YJ9	5/17/10	14.8		1.63	0.20	U	0.20	17800		16.3	59.8		0.813	3960		4.06
SPA-1	J19YH7	5/17/10	11.6		1.70	0.20	U	0.20	15400		17.0	4.63		0.850	3980		4.25
SPA-2	J19YH8	5/17/10	13.3		1.43	0.20	U	0.20	19900		14.3	9.70		0.717	4190		3.59
SPA-3	J19YH9	5/17/10	13.6		1.62	0.20	U	0.20	20600		16.2	9.45		0.811	4330		4.06
SPA-4	J19YJ0	5/17/10	12.2		1.29	0.20	U	0.20	16900		12.9	3.61		0.644	3880		3.22
SPA-5	J19YJ1	5/17/10	12.1		1.62	0.20	U	0.20	18000		16.2	9.15		0.810	3850		4.05
SPA-6	J19YJ2	5/17/10	15.3		1.55	0.20	U	0.20	16600		15.5	32.9		0.776	3520		3.88
SPA-7	J19YJ3	5/17/10	13.6		1.50	0.20	U	0.20	17500		15.0	19.3		0.748	4410		3.74
SPA-9	J19YJ5	5/17/10	14.1		1.26	0.20	U	0.20	17000		12.6	43.4		0.628	3890		3.14
SPA-10	J19YJ6	5/17/10	14.6		1.40	0.20	U	0.20	15300		14.0	42.8		0.699	3460		3.49
SPA-11	J19YJ7	5/17/10	12.9		1.40	0.20	U	0.20	18300		14.0	65.6		0.701	4190		3.51
SPA-12	J19YJ8	5/17/10	13.3		1.27	0.20	U	0.20	17800		12.7	87.1		0.636	3800		3.18

Attachment	1	Sheet No.	15 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	261		0.993	0.020	B	0.030	0.248	B	0.993	10.3		2.48	1070		99.3
SZ-11	J19YC8	5/18/10	258		0.960	0.027	U	0.027	0.271	B	0.960	13.4		2.40	924		96.0
DZ-8	J19YD8	5/18/10	230		0.967	0.012	B	0.030	0.248	B	0.967	8.37		2.42	821		96.7
DZ-8 re-sample 1	J1FKK8	3/16/11	219		0.097	0.0055	U	0.0055	0.250	U	0.25	9.50	X	0.12	808		39.9
DZ-1	J19YD1	5/18/10	220		0.737	0.011	B	0.030	0.213	B	0.737	7.68		1.84	769		73.7
DZ-1 re-sample 1	J1FKK1	3/16/11	217		0.091	0.0056	U	0.0056	0.370	B	0.24	12.5	X	0.11	850		37.4
DZ-2	J19YD2	5/18/10	269		1.03	0.011	B	0.030	0.288	B	1.03	12.1		2.58	658		103
DZ-2 re-sample 1	J1FKK2	3/16/11	230		0.10	0.0054	U	0.0054	0.490	B	0.27	9.40	X	0.13	829		41.9
DZ-3	J19YD3	5/18/10	259		1.05	0.012	B	0.030	0.315	B	1.05	12		2.62	978		105
DZ-3 re-sample 1	J1FKK3	3/16/11	271		0.11	0.0082	B	0.0059	0.290	U	0.29	15.4	X	0.13	1320		45.0
DZ-4	J19YD4	5/18/10	264		0.696	0.010	B	0.030	0.299	B	0.696	9.86		1.74	975		69.6
DZ-4 re-sample 1	J1FKK4	3/16/11	223		0.10	0.0052	U	0.0052	0.260	U	0.26	9.60	X	0.12	809		40.9
DZ-5	J19YD5	5/18/10	274		0.788	0.015	B	0.030	0.202	B	0.788	9.92		1.97	1110		78.8
DZ-6	J19YD6	5/18/10	251		0.713	0.009	B	0.030	0.264	B	0.713	9.93		1.78	844		71.3
DZ-7	J19YD7	5/18/10	283		0.794	0.159		0.030	0.320	B	0.794	10.4		1.98	985		79.4
DZ-7 re-sample 1	J1FKK7	3/16/11	230		0.097	0.0052	U	0.0052	0.250	U	0.25	10.1	X	0.12	843		39.9
DZ-9	J19YD9	5/18/10	247		0.870	0.025	U	0.025	0.367	B	0.870	13.7		2.18	731		87.0
DZ-10	J19YF0	5/18/10	257		0.748	0.026	U	0.026	0.239	B	0.748	7.11		1.87	735		74.8
DZ-11	J19YF1	5/18/10	262		0.842	0.026	U	0.026	0.617	B	0.842	9.14		2.10	892		84.2
DZ-12	J19YF2	5/18/10	251		0.780	0.010	B	0.030	0.262	B	0.780	9.58		1.95	840		78.0
Duplicate of J19YD1	J19YF3	5/18/10	246		0.929	0.027		0.030	0.346	B	0.929	8.62		2.32	802		92.9
Duplicate of J1FKK8	J1FKL3	3/16/11	251		0.098	0.0056	U	0.0056	0.250	U	0.25	9.90	X	0.12	780		40.0
OB-8	J19YH1	5/13/10	260		0.953	0.024	U	0.024	0.229	B	0.953	10.7		2.38	1070		95.3
SPA-8	J19YJ4	5/17/10	262		0.663	0.028	U	0.028	0.364	B	0.663	9.91		1.66	1410		66.3
Duplicate of J19YJ4	J19YJ9	5/17/10	271		0.813	0.026	U	0.026	0.401	B	0.813	10.2		2.03	1510		81.3
SPA-1	J19YH7	5/17/10	232		0.850	0.026	U	0.026	0.318	B	0.850	9.52		2.12	748		85.0
SPA-2	J19YH8	5/17/10	310		0.717	0.027	U	0.027	0.374	B	0.717	10.7		1.79	1800		71.7
SPA-3	J19YH9	5/17/10	330		0.811	0.028	U	0.028	0.331	B	0.811	10.9		2.03	1980		81.1
SPA-4	J19YJ0	5/17/10	260		0.644	0.024	U	0.024	0.282	B	0.644	10.2		1.61	1160		64.4
SPA-5	J19YJ1	5/17/10	289		0.810	0.025	U	0.025	0.338	B	0.810	10.6		2.02	1760		81.0
SPA-6	J19YJ2	5/17/10	247		0.776	0.023	B	0.030	0.495	B	0.776	9.26		1.94	1410		77.6
SPA-7	J19YJ3	5/17/10	259		0.748	0.024	U	0.024	0.344	B	0.748	12		1.87	1200		74.8
SPA-9	J19YJ5	5/17/10	257		0.628	0.015	B	0.030	0.348	B	0.628	11.2		1.57	1250		62.8
SPA-10	J19YJ6	5/17/10	226		0.699	0.057		0.030	0.377	B	0.699	9.57		1.75	1190		69.9
SPA-11	J19YJ7	5/17/10	275		0.701	0.025	U	0.025	0.304	B	0.701	10.4		1.75	1520		70.1
SPA-12	J19YJ8	5/17/10	263		0.636	0.026	U	0.026	0.312	B	0.636	10.3		1.59	1720		63.6

Attachment	1	Sheet No.	16 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	0.298	U	0.298	709		5.96	0.993	U	0.993	194		49.7	45.5		0.993
SZ-11	J19YC8	5/18/10	0.288	U	0.288	497		5.76	0.960	U	0.960	256		48.0	41.2		0.960
DZ-8	J19YD8	5/18/10	0.290	U	0.290	552		5.80	0.967	U	0.967	210		48.3	43.3		0.967
DZ-8 re-sample 1	J1FKK8	3/16/11	0.840	U	0.84	224		5.50	0.160	U	0.16	221		57.4	35.1		0.091
DZ-1	J19YD1	5/18/10	0.221	U	0.221	496		4.42	0.737	U	0.737	178		36.8	41.0		0.737
DZ-1 re-sample 1	J1FKK1	3/16/11	1.3		0.78	182	N	5.20	0.150	U	0.15	287		53.8	37.2		0.086
DZ-2	J19YD2	5/18/10	0.310	U	0.310	742		6.20	1.03	U	1.03	285		51.7	59.1		1.03
DZ-2 re-sample 1	J1FKK2	3/16/11	1.6		0.88	202		5.80	0.160	U	0.16	223		60.3	43.1		0.096
DZ-3	J19YD3	5/18/10	0.315	U	0.315	1330		6.29	1.05	U	1.05	267		52.4	47.2		1.05
DZ-3 re-sample 1	J1FKK3	3/16/11	0.940	U	0.94	305		6.20	0.180	U	0.18	240		64.7	34.6		0.10
DZ-4	J19YD4	5/18/10	0.209	U	0.209	1140		4.18	0.696	U	0.696	276		34.8	47.2		0.696
DZ-4 re-sample 1	J1FKK4	3/16/11	0.860	U	0.86	224		5.60	0.160	U	0.16	245		58.8	45.0		0.094
DZ-5	J19YD5	5/18/10	0.236	U	0.236	722		4.73	0.175	B	0.788	212		39.4	45.1		0.788
DZ-6	J19YD6	5/18/10	0.214	U	0.214	634		4.28	0.713	U	0.713	214		35.6	44.3		0.713
DZ-7	J19YD7	5/18/10	0.238	U	0.238	1190		4.76	0.794	U	0.794	247		39.7	49.3		0.794
DZ-7 re-sample 1	J1FKK7	3/16/11	0.840	U	0.84	268		5.50	0.160	U	0.16	211		57.4	32.6		0.091
DZ-9	J19YD9	5/18/10	0.261	U	0.261	507		5.22	0.870	U	0.870	221		43.5	50.2		0.870
DZ-10	J19YF0	5/18/10	0.225	U	0.225	434		4.49	0.748	U	0.748	224		37.4	48.4		0.748
DZ-11	J19YF1	5/18/10	0.253	U	0.253	565		5.05	0.842	U	0.842	245		42.1	45.8		0.842
DZ-12	J19YF2	5/18/10	0.234	U	0.234	394		4.68	0.780	U	0.780	233		39.0	44.1		0.780
Duplicate of J19YD1	J19YF3	5/18/10	0.279	U	0.279	563		5.57	0.929	U	0.929	174		46.5	45.4		0.929
Duplicate of J1FKK8	J1FKL3	3/16/11	0.840	U	0.84	208		5.50	0.160	U	0.16	217		57.6	35.2		0.092
OB-8	J19YH1	5/13/10	0.286	U	0.286	203		5.72	0.953	U	0.953	216		47.7	46.3		0.953
SPA-8	J19YJ4	5/17/10	0.199	U	0.199	433		3.98	0.145	B	0.663	183		33.2	44.8		0.663
Duplicate of J19YJ4	J19YJ9	5/17/10	0.244	U	0.244	637		4.88	0.813	U	0.813	191		40.6	46.1		0.813
SPA-1	J19YH7	5/17/10	0.255	U	0.255	362		5.10	0.85	U	0.850	173		42.5	40.9		0.850
SPA-2	J19YH8	5/17/10	0.215	U	0.215	617		4.30	0.717	U	0.717	200		35.9	47.0		0.717
SPA-3	J19YH9	5/17/10	0.243	U	0.243	753		4.87	0.811	U	0.811	203		40.6	46.3		0.811
SPA-4	J19YJ0	5/17/10	0.193	U	0.193	412		3.86	0.142	B	0.644	175		32.2	43.4		0.644
SPA-5	J19YJ1	5/17/10	0.243	U	0.243	493		4.86	0.810	U	0.810	179		40.5	41.1		0.810
SPA-6	J19YJ2	5/17/10	0.233	U	0.233	527		4.66	0.776	U	0.776	248		38.8	44.5		0.776
SPA-7	J19YJ3	5/17/10	0.224	U	0.224	535		4.49	0.748	U	0.748	220		37.4	43.7		0.748
SPA-9	J19YJ5	5/17/10	0.188	U	0.188	466		3.77	0.628	U	0.628	190		31.4	43.2		0.628
SPA-10	J19YJ6	5/17/10	0.210	U	0.210	442		4.19	0.145	B	0.699	190		34.9	39.1		0.699
SPA-11	J19YJ7	5/17/10	0.210	U	0.210	493		4.21	0.178	B	0.701	182		35.1	45.3		0.701
SPA-12	J19YJ8	5/17/10	0.191	U	0.191	457		3.82	0.157	B	0.636	191		31.8	45.0		0.636

Attachment	1	Sheet No.	17 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data.

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
SZ-9	J19YC6	5/18/10	35.4		2.98
SZ-11	J19YC8	5/18/10	38.3		2.88
DZ-8	J19YD8	5/18/10	34.0		2.90
DZ-8 re-sample 1	J1FKK8	3/16/11	30.8	X	0.39
DZ-1	J19YD1	5/18/10	32.6		2.21
DZ-1 re-sample 1	J1FKK1	3/16/11	31.9	X	0.36
DZ-2	J19YD2	5/18/10	38.7		3.10
DZ-2 re-sample 1	J1FKK2	3/16/11	34.1	X	0.41
DZ-3	J19YD3	5/18/10	38.2		3.15
DZ-3 re-sample 1	J1FKK3	3/16/11	40.4	X	0.44
DZ-4	J19YD4	5/18/10	36.7		2.09
DZ-4 re-sample 1	J1FKK4	3/16/11	33.6	X	0.40
DZ-5	J19YD5	5/18/10	36.7		2.36
DZ-6	J19YD6	5/18/10	33.4		2.14
DZ-7	J19YD7	5/18/10	70.2		2.38
DZ-7 re-sample 1	J1FKK7	3/16/11	41.6	X	0.39
DZ-9	J19YD9	5/18/10	36.1		2.61
DZ-10	J19YF0	5/18/10	38.0		2.25
DZ-11	J19YF1	5/18/10	41.3		2.53
DZ-12	J19YF2	5/18/10	48.8		2.34
Duplicate of J19YD1	J19YF3	5/18/10	34.6		2.79
Duplicate of J1FKK8	J1FKL3	3/16/11	33.7	X	0.39
OB-8	J19YH1	5/13/10	35.1		2.86
SPA-8	J19YJ4	5/17/10	40.0		1.99
Duplicate of J19YJ4	J19YJ9	5/17/10	41.7		2.44
SPA-1	J19YH7	5/17/10	34.0		2.55
SPA-2	J19YH8	5/17/10	38.8		2.15
SPA-3	J19YH9	5/17/10	39.9		2.43
SPA-4	J19YJ0	5/17/10	32.5		1.93
SPA-5	J19YJ1	5/17/10	37.9		2.43
SPA-6	J19YJ2	5/17/10	45.0		2.33
SPA-7	J19YJ3	5/17/10	37.9		2.24
SPA-9	J19YJ5	5/17/10	41.6		1.88
SPA-10	J19YJ6	5/17/10	38.0		2.10
SPA-11	J19YJ7	5/17/10	42.0		2.10
SPA-12	J19YJ8	5/17/10	41.2		1.91

Attachment	1	Sheet No.	18 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.184	U	0.184	0.106	U	0.106	0.701	UJ	0.814	0.075	U	0.075	0.072	U	0.072
Duplicate of J19YB9	J19YD0	5/18/10	0.096	U	0.096	0.09	U	0.09	1.2		0.938	0.076	U	0.076	0.086	U	0.086
SZ-1	J19YB8	5/18/10	0.353	U	0.353	0.101	U	0.101	0.772	UJ	0.882	0.089	U	0.089	0.102	U	0.102
SZ-3	J19YC0	5/18/10	0.129	U	0.129	0.065	U	0.065	0.773	UJ	0.799	0.104	U	0.104	0.067	U	0.067
SZ-4	J19YC1	5/18/10	0.09	U	0.09	0.071	U	0.071	0.946	J	0.802	0.067	U	0.067	0.088	U	0.088
SZ-5	J19YC2	5/18/10	0.113	U	0.113	0.112	U	0.112	0.809	UJ	0.97	0.119	U	0.119	0.112	U	0.112
SZ-6	J19YC3	5/18/10	0.324	U	0.324	0.086	U	0.086	0.603	UJ	0.893	0.06	U	0.06	0.064	U	0.064
SZ-7	J19YC4	5/18/10	0.079	U	0.079	0.074	U	0.074	0.874	J	0.805	0.059	U	0.059	0.071	U	0.071
SZ-8	J19YC5	5/18/10	0.326	U	0.326	0.094	U	0.094	0.521	UJ	0.916	0.085	U	0.085	0.096	U	0.096
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	-0.00749	U	0.136	-0.0114	U	0.0239	0.000142	U	0.463	0.0128	U	0.026	-0.00411	U	0.0253
SZ-10	J19YC7	5/18/10	0.115	U	0.115	0.051	U	0.051	0.52	UJ	0.801	0.052	U	0.052	0.064	U	0.064
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	-0.0388	U	0.119	0.0163	U	0.034	-0.0394	U	0.464	0.00519	U	0.0271	-0.00749	U	0.0237
SZ-12	J19YC9	5/18/10	0.049	U	0.049	0.019	U	0.019	0.951		0.867	0.019	U	0.019	0.019	U	0.019
DZ-1	J19YD1	5/18/10	0.074	U	0.074	0.062	U	0.062	0.718	UJ	0.918	0.069	U	0.069	0.086	U	0.086
Duplicate of J19YD1	J19YF3	5/18/10	0.091	U	0.091	0.064	U	0.064	0.903		0.883	0.074	U	0.074	0.085	U	0.085
DZ-2	J19YD2	5/18/10	0.093	U	0.093	0.107	U	0.107	0.203	UJ	0.85	0.089	U	0.089	0.082	U	0.082
DZ-3	J19YD3	5/18/10	0.367	U	0.367	0.102	U	0.102	1.23	J	0.881	0.095	U	0.095	0.108	U	0.108
DZ-4	J19YD4	5/18/10	0.329	U	0.329	0.094	U	0.094	0.534	UJ	0.841	0.078	U	0.078	0.103	U	0.103
DZ-5	J19YD5	5/18/10	0.274	U	0.274	0.083	U	0.083	0.267	UJ	0.961	0.056	U	0.056	0.068	U	0.068
DZ-6	J19YD6	5/18/10	0.313	U	0.313	0.088	U	0.088	1.15	J	0.809	0.089	U	0.089	0.087	U	0.087
DZ-7	J19YD7	5/18/10	0.313	U	0.313	0.09	U	0.09	0.725	UJ	0.83	0.594		0.087	0.145		0.076
DZ-8	J19YD8	5/18/10	0.094	U	0.094	0.064	U	0.064	0.513	UJ	0.881	0.071	U	0.071	0.086	U	0.086
DZ-9	J19YD9	5/18/10	0.117	U	0.117	0.123	U	0.123	0.581	UJ	0.86	0.114	U	0.114	0.095	U	0.095
DZ-10	J19YF0	5/18/10	0.151	U	0.151	0.055	U	0.055	0.509	UJ	0.8	0.055	U	0.055	0.072	U	0.072
DZ-11	J19YF1	5/18/10	0.169	U	0.169	0.062	U	0.062	1.41		0.901	0.066	U	0.066	0.055	U	0.055
DZ-12	J19YF2	5/18/10	0.305	U	0.305	0.096	U	0.096	0.766	U	0.9	0.078	U	0.078	0.086	U	0.086

Attachment	1	Sheet No.	19 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Nickel-63			Plutonium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.219	U	0.219	0.250	U	0.250	0.199	U	0.199	-0.391	U	3.08	0	U	0.234
Duplicate of J19YB9	J19YD0	5/18/10	0.193	U	0.193	0.274	U	0.274	0.190	U	0.190	0.357	U	2.66	0.174	U	0.277
SZ-1	J19YB8	5/18/10	0.208	U	0.208	0.351	U	0.351	0.182	U	0.182	-0.726	U	3.17	0	U	0.238
SZ-3	J19YC0	5/18/10	0.175	U	0.175	0.224	U	0.224	0.210	U	0.210	0.638	U	2.96	0.027	U	0.263
SZ-4	J19YC1	5/18/10	0.179	U	0.179	0.294	U	0.294	0.149	U	0.149	-0.971	U	3.32	-0.031	U	0.301
SZ-5	J19YC2	5/18/10	0.315	U	0.315	0.334	U	0.334	0.225	U	0.225	-1.27	U	3.22	0.022	U	0.244
SZ-6	J19YC3	5/18/10	0.155	U	0.155	0.180	U	0.180	0.168	U	0.168	-1.42	U	3.02	0	U	0.235
SZ-7	J19YC4	5/18/10	0.161	U	0.161	0.206	U	0.206	0.147	U	0.147	-0.443	U	2.9	0.078	U	0.286
SZ-8	J19YC5	5/18/10	0.199	U	0.199	0.269	U	0.269	0.178	U	0.178	-0.038	U	2.98	0.118	U	0.226
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.018	U	0.060	-0.0255	U	0.0851	0.0622	U	0.0668	-2.08	U	13.8	-0.00582	U	0.139
SZ-10	J19YC7	5/18/10	0.157	U	0.157	0.195	U	0.195	0.121	U	0.121	1.05	U	2.96	0.006	U	0.099
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	-0.024	U	0.0746	-0.0418	U	0.0849	-0.0139	U	0.0892	18.5		14.6	-0.00166	U	0.125
SZ-12	J19YC9	5/18/10	0.052	U	0.052	0.069	U	0.069	0.045	U	0.045	1.28	U	2.97	-0.094	U	0.347
DZ-1	J19YD1	5/18/10	0.174	U	0.174	0.269	U	0.269	0.135	U	0.135	-0.528	U	2.97	0.005	U	0.089
Duplicate of J19YD1	J19YF3	5/18/10	0.192	U	0.192	0.272	U	0.272	0.140	U	0.140	0.44	U	2.98	0.051	U	0.194
DZ-2	J19YD2	5/18/10	0.240	U	0.240	0.278	U	0.278	0.174	U	0.174	-0.578	U	3.03	-0.005	U	0.091
DZ-3	J19YD3	5/18/10	0.230	U	0.230	0.317	U	0.317	0.207	U	0.207	0.524	U	3.17	-0.027	U	0.087
DZ-4	J19YD4	5/18/10	0.209	U	0.209	0.249	U	0.249	0.195	U	0.195	-0.498	U	3.02	-0.005	U	0.098
DZ-5	J19YD5	5/18/10	0.162	U	0.162	0.207	U	0.207	0.184	U	0.184	0.087	U	3.44	0.017	U	0.111
DZ-6	J19YD6	5/18/10	0.182	U	0.182	0.256	U	0.256	0.169	U	0.169	-0.158	U	3.11	0.014	U	0.142
DZ-7	J19YD7	5/18/10	2.28		0.200	0.284	U	0.284	0.245	U	0.245	13.2		3.19	0.006	U	0.114
DZ-8	J19YD8	5/18/10	0.198	U	0.198	0.291	U	0.291	0.145	U	0.145	-0.232	U	3.05	0.005	U	0.047
DZ-9	J19YD9	5/18/10	0.280	U	0.280	0.340	U	0.340	0.256	U	0.256	0	U	2.96	-0.017	U	0.063
DZ-10	J19YF0	5/18/10	0.181	U	0.181	0.253	U	0.253	0.141	U	0.141	0.914	U	3	0	U	0.063
DZ-11	J19YF1	5/18/10	0.182	U	0.182	0.197	U	0.197	0.170	U	0.170	1.5	U	2.8	0.057	U	0.275
DZ-12	J19YF2	5/18/10	0.183	U	0.183	0.294	U	0.294	0.194	U	0.194	1.4	U	2.75	0.082	U	0.392

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Plutonium-239/240			Potassium-40			Radium-226			Radium-228			Silver-108 metastable		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0	U	0.234	14.6		0.54	0.683		0.148	1.17		0.266	0.062	U	0.062
Duplicate of J19YB9	J19YD0	5/18/10	0	U	0.222	13		0.676	0.670		0.154	1.09		0.371	0.058	U	0.058
SZ-1	J19YB8	5/18/10	0	U	0.238	13.1		0.746	0.493		0.166	0.638		0.365	0.064	U	0.064
SZ-3	J19YC0	5/18/10	0.027	U	0.210	13.1		0.442	0.409		0.128	0.549		0.276	0.048	U	0.048
SZ-4	J19YC1	5/18/10	0	U	0.241	15.5		0.629	0.448		0.162	0.877		0.328	0.051	U	0.051
SZ-5	J19YC2	5/18/10	0	U	0.169	13.6		1.07	0.585		0.225	0.462		0.452	0.075	U	0.075
SZ-6	J19YC3	5/18/10	-0.025	U	0.188	12.8		0.617	0.536		0.134	0.684		0.242	0.046	U	0.046
SZ-7	J19YC4	5/18/10	0.052	U	0.198	13.3		0.616	0.454		0.133	0.664		0.272	0.049	U	0.049
SZ-8	J19YC5	5/18/10	0	U	0.180	13.8		0.502	0.551		0.138	0.898		0.209	0.053	U	0.053
SZ-9	J19YC6	5/18/10	0	U	0.214	12.5		0.753	0.511		0.132	0.461		0.377	0.066	U	0.066
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	-0.00291	U	0.121										0.00194	U	0.0178
SZ-10	J19YC7	5/18/10	-0.006	U	0.071	10.9		0.531	0.344		0.112	0.424		0.255	0.041	U	0.041
SZ-11	J19YC8	5/18/10	0	U	0.234	15.6		0.392	0.684		0.08	0.868		0.17	0.029	U	0.029
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	-0.00166	U	0.125										-0.0059	U	0.0213
SZ-12	J19YC9	5/18/10	0	U	0.240	12		0.214	0.374		0.039	0.598		0.102	0.014	U	0.014
DZ-1	J19YD1	5/18/10	0.01	U	0.07	15.1		0.78	0.502		0.135	0.800		0.302	0.047	U	0.047
Duplicate of J19YD1	J19YF3	5/18/10	0	U	0.194	15.1		0.852	0.576		0.128	0.539		0.333	0.052	U	0.052
DZ-2	J19YD2	5/18/10	-0.01	U	0.057	9.42		0.79	0.425		0.165	0.349		0.338	0.061	U	0.061
DZ-3	J19YD3	5/18/10	-0.005	U	0.052	12.4		0.859	0.420		0.168	0.739		0.232	0.072	U	0.072
DZ-4	J19YD4	5/18/10	0	U	0.044	10.9		1.35	0.437		0.155	0.654		0.349	0.060	U	0.060
DZ-5	J19YD5	5/18/10	-0.006	U	0.071	11.5		0.709	0.495		0.126	0.828		0.258	0.048	U	0.048
DZ-6	J19YD6	5/18/10	0.007	U	0.055	11.0		1.05	0.505		0.154	0.571		0.314	0.055	U	0.055
DZ-7	J19YD7	5/18/10	0.028	U	0.053	12.0		0.622	0.417		0.166	0.402		0.364	0.054	U	0.054
DZ-8	J19YD8	5/18/10	-0.005	U	0.037	14.2		0.809	0.586		0.142	0.434		0.393	0.052	U	0.052
DZ-9	J19YD9	5/18/10	-0.006	U	0.044	13.2		1.06	0.619		0.24	0.98		0.438	0.082	U	0.082
DZ-10	J19YF0	5/18/10	0	U	0.039	12.4		0.609	0.402		0.111	0.551		0.293	0.047	U	0.047
DZ-11	J19YF1	5/18/10	0.086	U	0.219	13.0		0.588	0.483		0.101	0.641		0.239	0.047	U	0.047
DZ-12	J19YF2	5/18/10	0.041	U	0.313	11.5		0.61	0.490		0.15	0.373	U	0.377	0.066	U	0.066

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.036	U	0.391	0.977		0.102	1.17		0.266	-0.045	U	0.316	2.83	J	2.55
Duplicate of J19YB9	J19YD0	5/18/10	-0.043	U	0.388	0.965		0.097	1.09		0.371	-0.050	U	0.236	-0.308	U	3.15
SZ-1	J19YB8	5/18/10	0.195	U	0.398	0.528		0.149	0.638		0.365	-0.026	U	0.303	4.84	J	2.66
SZ-3	J19YC0	5/18/10	0.045	U	0.401	0.655		0.123	0.549		0.276	0.0010	U	0.277	3.97	J	2.63
SZ-4	J19YC1	5/18/10	0.185	U	0.385	0.647		0.091	0.877		0.328	-0.096	U	0.296	4.01	J	2.53
SZ-5	J19YC2	5/18/10	0.082	U	0.404	0.654		0.209	0.462		0.452	0.028	U	0.257	3.72	J	2.63
SZ-6	J19YC3	5/18/10	0.115	U	0.377	0.662		0.085	0.684		0.242	-0.036	U	0.264	4.70	J	2.78
SZ-7	J19YC4	5/18/10	0.069	U	0.363	0.546		0.087	0.664		0.272	0.012	U	0.281	5.90	J	2.59
SZ-8	J19YC5	5/18/10	0.125	U	0.389	0.63		0.107	0.898		0.209	2.4		0.242	0.994	J	2.73
SZ-9	J19YC6	5/18/10	0.133	U	0.414	0.642		0.100	0.461		0.377	-0.065	U	0.309	3.19	J	2.62
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.283	U	0.639							-0.0679	U	0.174	0.0527		0.0245
SZ-10	J19YC7	5/18/10	0.029	U	0.387	0.49		0.071	0.424		0.255	-0.077	U	0.251	3.75	J	2.64
SZ-11	J19YC8	5/18/10	-0.091	U	0.37	0.73		0.055	0.868		0.17	0.113	U	0.235	0.097	U	2.99
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.467	U	0.644							-0.0415	U	0.193	0.0530		0.0137
SZ-12	J19YC9	5/18/10	-0.021	U	0.394	0.499		0.025	0.598		0.102	-0.0050	U	0.252	-0.774	U	2.97
DZ-1	J19YD1	5/18/10	0.13	U	0.382	0.668		0.086	0.800		0.302	-0.051	U	0.226	4.53	J	2.71
Duplicate of J19YD1	J19YF3	5/18/10	-0.086	U	0.39	0.731		0.086	0.539		0.333	-0.084	U	0.217	0.202	U	3.10
DZ-2	J19YD2	5/18/10	0.175	U	0.434	0.505		0.105	0.349		0.338	-0.060	U	0.291	2.13	UJ	2.60
DZ-3	J19YD3	5/18/10	0.289	U	0.424	0.876		0.163	0.739		0.232	0.194	U	0.326	1.79	UJ	2.58
DZ-4	J19YD4	5/18/10	0.166	U	0.375	0.586		0.147	0.654		0.349	0.059	U	0.257	2.55	UJ	2.64
DZ-5	J19YD5	5/18/10	0.146	U	0.492	0.586		0.087	0.828		0.258	0.071	U	0.311	1.72	UJ	2.76
DZ-6	J19YD6	5/18/10	0.194	U	0.384	0.544		0.091	0.571		0.314	0.051	U	0.244	2.32	UJ	2.55
DZ-7	J19YD7	5/18/10	0.114	U	0.37	0.613		0.090	0.402		0.364	-0.065	U	0.285	4.34	J	2.59
DZ-8	J19YD8	5/18/10	0.227	U	0.442	0.691		0.088	0.434		0.393	0.012	U	0.266	1.06	UJ	2.65
DZ-9	J19YD9	5/18/10	0.15	U	0.387	0.557		0.147	0.980		0.438	-0.110	U	0.324	1.91	UJ	2.62
DZ-10	J19YF0	5/18/10	-0.013	U	0.408	0.607		0.075	0.551		0.293	-0.053	U	0.272	2.53	J	2.53
DZ-11	J19YF1	5/18/10	-0.029	U	0.385	0.750		0.126	0.641		0.239	-0.020	U	0.228	1.06	U	2.96
DZ-12	J19YF2	5/18/10	0.012	U	0.400	0.615		0.175	0.373	U	0.377	0.0060	U	0.207	0.297	U	3.03

Attachment	1	Sheet No.	22 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-2	J19YB9	5/18/10	0.77		0.226	0	U	0.274	0.439	U	0.439	0.681		0.226	8.59	U	8.59
Duplicate of J19YB9	J19YD0	5/18/10	0.930		0.178	0.084	U	0.215	0.405	U	0.405	0.768		0.178	9.41	U	9.41
SZ-1	J19YB8	5/18/10	0.266		0.157	0.050	U	0.190	0.435	U	0.435	0.225		0.157	11.2	U	11.2
SZ-3	J19YC0	5/18/10	0.395		0.233	0	U	0.282	0.301	U	0.301	0.426		0.233	7.38	U	7.38
SZ-4	J19YC1	5/18/10	0.326		0.226	0.036	U	0.274	0.388	U	0.388	0.444		0.226	10.4	U	10.4
SZ-5	J19YC2	5/18/10	0.811		0.222	0.035	U	0.268	0.538	U	0.538	0.753		0.222	14.2	U	14.2
SZ-6	J19YC3	5/18/10	0.739		0.202	0.064	U	0.244	0.378	U	0.378	0.739		0.202	7.18	U	7.18
SZ-7	J19YC4	5/18/10	0.594		0.216	0	U	0.262	0.335	U	0.335	0.678		0.216	7.21	U	7.21
SZ-8	J19YC5	5/18/10	0.724		0.213	0	U	0.258	0.423	U	0.423	0.669		0.213	10.0	U	10.0
SZ-9	J19YC6	5/18/10	0.575		0.259	0.041	U	0.314	0.380	U	0.380	0.542		0.259	10.4	U	10.4
SZ-9 re-sample 1[a]	J1FKL4	3/16/11	0.0792	U	0.114	-0.00137	U	0.102				0.214		0.123			
SZ-10	J19YC7	5/18/10	0.609		0.245	0.039	U	0.297	0.244	U	0.244	0.833		0.245	6.37	U	6.37
SZ-11	J19YC8	5/18/10	0.688		0.176	0.028	U	0.213	0.200	U	0.200	0.551		0.176	4.10	U	4.10
SZ-11 re-sample 1[a]	J1FKL5	3/16/11	0.196		0.123	-0.00163	U	0.123				0.454		0.137			
SZ-12	J19YC9	5/18/10	0.552		0.156	0.025	U	0.189	0.106	U	0.106	0.368		0.156	2.31	U	2.31
DZ-1	J19YD1	5/18/10	0.766		0.279	0	U	0.338	0.336	U	0.336	0.620		0.279	7.78	U	7.78
Duplicate of J19YD1	J19YF3	5/18/10	0.567		0.181	0	U	0.219	0.372	U	0.372	0.543		0.181	9.63	U	9.63
DZ-2	J19YD2	5/18/10	0.318		0.244	0	U	0.295	0.420	U	0.420	0.510		0.244	10.0	U	10.0
DZ-3	J19YD3	5/18/10	0.380		0.242	0	U	0.293	0.467	U	0.467	0.570		0.242	11.8	U	11.8
DZ-4	J19YD4	5/18/10	0.395		0.202	0.064	U	0.244	0.391	U	0.391	0.501		0.202	11.1	U	11.1
DZ-5	J19YD5	5/18/10	0.870		0.215	0.136	U	0.26	0.355	U	0.355	0.533		0.215	7.77	U	7.77
DZ-6	J19YD6	5/18/10	0.702		0.244	0.039	U	0.296	0.340	U	0.340	0.766		0.244	9.78	U	9.78
DZ-7	J19YD7	5/18/10	0.648		0.236	0	U	0.286	0.432	U	0.432	0.833		0.236	9.63	U	9.63
DZ-8	J19YD8	5/18/10	0.430		0.206	0.033	U	0.249	0.340	U	0.340	0.349		0.206	10.5	U	10.5
DZ-9	J19YD9	5/18/10	0.709		0.209	0.066	U	0.253	0.598	U	0.598	0.546		0.209	12.7	U	12.7
DZ-10	J19YF0	5/18/10	0.594		0.182	0	U	0.22	0.326	U	0.326	0.570		0.182	6.66	U	6.66
DZ-11	J19YF1	5/18/10	0.371		0.149	0	U	0.181	0.371	U	0.371	0.488		0.149	7.59	U	7.59
DZ-12	J19YF2	5/18/10	0.553		0.184	0	U	0.223	0.390	U	0.390	0.481		0.184	9.86	U	9.86

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.322	U	0.322	0.088	U	0.088	0.663	U	0.866	0.076	U	0.076	0.086	U	0.086
Duplicate of J19YF8	J19YH6	5/13/10	0.092	U	0.092	0.076	U	0.076	0.91	U	0.933	0.076	U	0.076	0.086	U	0.086
OB-1	J19YF4	5/13/10	0.088	U	0.088	0.08	U	0.08	0.576	U	0.674	0.078	U	0.078	0.082	U	0.082
OB-2	J19YF5	5/13/10	0.189	U	0.189	0.088	U	0.088	0.872	U	0.968	0.062	U	0.062	0.063	U	0.063
OB-3	J19YF6	5/13/10	0.155	U	0.155	0.065	U	0.065	0.145	U	0.982	0.057	U	0.057	0.045	U	0.045
OB-4	J19YF7	5/13/10	0.115	U	0.115	0.115	U	0.115	1.54		0.92	0.107	U	0.107	0.098	U	0.098
OB-6	J19YF9	5/13/10	0.084	U	0.084	0.084	U	0.084	1.24		0.89	0.076	U	0.076	0.077	U	0.077
OB-7	J19YH0	5/13/10	0.080	U	0.080	0.065	U	0.065	1.24		0.917	0.064	U	0.064	0.063	U	0.063
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.00932	U	0.0535	0.0144	U	0.0345	-0.0486	U	0.451	-0.00478	U	0.0298	0.0183	U	0.0346
OB-9	J19YH2	5/13/10	0.327	U	0.327	0.096	U	0.096	1.49		0.882	0.068	U	0.068	0.059	U	0.059
OB-10	J19YH3	5/13/10	0.169	U	0.169	0.08	U	0.08	1.02		0.904	0.066	U	0.066	0.063	U	0.063
OB-11	J19YH4	5/13/10	0.144	U	0.144	0.066	U	0.066	0.261	U	0.882	0.07	U	0.07	0.064	U	0.064
OB-12	J19YH5	5/13/10	0.11	U	0.11	0.11	U	0.11	0.43	U	0.943	0.108	U	0.108	0.1	U	0.1
OB-13	J1B4H9	5/17/10	0.064	U	0.064	0.032	U	0.032	0.051	U	0.513	0.036	U	0.036	0.02	U	0.02
OB-14	J1B4J0	5/17/10	0.066	U	0.066	0.059	U	0.059	0.063	U	0.511	0.056	U	0.056	0.063	U	0.063
OB-15	J1B4J1	5/17/10	0.124	U	0.124	0.064	U	0.064	-0.251	U	0.526	0.051	U	0.051	0.044	U	0.044
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	-0.039	U	0.0841	-0.00873	U	0.0854	-0.111	U	0.451	-0.0328	U	0.080	0.0179	U	0.0926
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	-0.0217	U	0.060	0.00758	U	0.060	0.101	U	0.449	0.0326	U	0.0608	0.00354	U	0.0733
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	-0.0570	U	0.147	0.000485	U	0.0237	-0.147	U	0.450	0.0180	U	0.0258	0.00260	U	0.0277
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	-0.0572	U	0.102	-0.00127	U	0.0358	0.0345	U	0.450	-0.00760	U	0.0341	0.00647	U	0.0366
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.0308	U	0.119	0.0276	U	0.0339	0.0399	U	0.450	-0.00482	U	0.0262	-0.000687	U	0.0246
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	-0.0244	U	0.183	-0.0036	U	0.0841	-0.0225	U	0.448	0.0528	U	0.0969	-0.0159	U	0.0789
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	-0.0974	U	0.221	0.0144	U	0.0420	0.0136	U	0.450	0.0515	U	0.0571	0.00491	U	0.0475
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.00323	U	0.126	0.0253	U	0.0356	0.298	U	0.450	0.0679		0.0285	-0.000156	U	0.0269
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	-0.000684	U	0.0531	-0.00388	U	0.0345	0.247	U	0.449	-0.00511	U	0.0279	-0.00386	U	0.0301
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	-0.0178	U	0.152	0.00169	U	0.0388	0.013	U	0.451	-0.0167	U	0.0322	-0.00777	U	0.0309
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	-0.00934	U	0.106	-0.00819	U	0.0342	0.0793	U	0.451	-0.00722	U	0.0312	-0.00823	U	0.0323
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.0161	U	0.0633	-0.00795	U	0.0377	0.0241	U	0.450	-0.0125	U	0.0343	0.00316	U	0.0340
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	-0.0546	U	0.143	0.0104	U	0.0242	0.0821	U	0.452	0.0167	U	0.0248	-0.0123	U	0.0232

Attachment	1	Sheet No.	24 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Nickel-63			Plutonium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.175	U	0.175	0.305	U	0.305	0.185	U	0.185	-0.447	U	3.29	-0.056	U	0.269
Duplicate of J19YF8	J19YH6	5/13/10	0.198	U	0.198	0.262	U	0.262	0.151	U	0.151	0.122	U	3.28	0.03	U	0.23
OB-1	J19YF4	5/13/10	0.160	U	0.160	0.256	U	0.256	0.154	U	0.154	-0.475	U	3.49	0.024	U	0.227
OB-2	J19YF5	5/13/10	0.177	U	0.177	0.212	U	0.212	0.168	U	0.168	-0.354	U	3.58	0.267		0.227
OB-3	J19YF6	5/13/10	0.170	U	0.170	0.231	U	0.231	0.138	U	0.138	1.22	U	3.41	-0.056	U	0.267
OB-4	J19YF7	5/13/10	0.260	U	0.260	0.314	U	0.314	0.220	U	0.220	0.342	U	3.46	0	U	0.332
OB-6	J19YF9	5/13/10	0.160	U	0.160	0.245	U	0.245	0.155	U	0.155	-0.341	U	3.45	-0.058	U	0.322
OB-7	J19YH0	5/13/10	0.158	U	0.158	0.207	U	0.207	0.132	U	0.132	-0.419	U	3.39	0.023	U	0.224
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.0432	U	0.0774	-0.0353	U	0.0992	0.0820	U	0.0773	0.364	U	13.5	0.0395	U	0.148
OB-9	J19YH2	5/13/10	0.169	U	0.169	0.205	U	0.205	0.189	U	0.189	-0.121	U	3.27	1.46		0.298
OB-10	J19YH3	5/13/10	0.158	U	0.158	0.166	U	0.166	0.176	U	0.176	0.342	U	3.46	-0.024	U	0.180
OB-11	J19YH4	5/13/10	0.169	U	0.169	0.22	U	0.22	0.148	U	0.148	-0.36	U	3.24	-0.022	U	0.170
OB-12	J19YH5	5/13/10	0.242	U	0.242	0.301	U	0.301	0.201	U	0.201	-0.237	U	3.2	0	U	0.185
OB-13	J1B4H9	5/17/10	0.067	U	0.067	0.07	U	0.07	0.065	U	0.065	-0.185	U	2.8	0.037	U	0.282
OB-14	J1B4J0	5/17/10	0.132	U	0.132	0.170	U	0.170	0.120	U	0.120	1.61	U	3.12	-0.055	U	0.262
OB-15	J1B4J1	5/17/10	0.142	U	0.142	0.163	U	0.163	0.124	U	0.124	0.797	U	3.17	0	U	0.242
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.0133	U	0.19	0.0174	U	0.279	0.00650	U	0.139	2.88	U	13.7	-0.00601	U	0.144
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0315	U	0.142	0.0430	U	0.216	0.0503	U	0.0970	1.71	U	13.6	0.0284	U	0.107
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	-0.00782	U	0.0570	0.00821	U	0.0841	0.0574	U	0.0674	1.47	U	12.8	0	U	0.131
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	-0.0164	U	0.0798	-0.0137	U	0.113	0.0727	U	0.0855	3.23	U	12.3	0.0523	U	0.196
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.0155	U	0.0745	-0.0515	U	0.0864	-0.00494	U	0.0883	-0.318	U	12.2	0	U	0.171
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.00384	U	0.198	0.0477	U	0.274	0.0990	U	0.163	0.313	U	13.3	-0.00196	U	0.147
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.0258	U	0.0974	0.00254	U	0.169	0.0255	U	0.0921	-1.31	U	12.3	-0.00155	U	0.116
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	-0.00760	U	0.0743	-0.00187	U	0.087	0.0387	U	0.0964	-1.96	U	13.5	0.0324	U	0.128
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.0126	U	0.0769	0.0108	U	0.099	0.0332	U	0.0751	0.329	U	14.0	-0.00471	U	0.141
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	-0.0923	U	0.0831	-0.0761	U	0.0927	0.00794	U	0.111	-2.08	U	11.9	-0.00179	U	0.133
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	-0.0122	U	0.0809	0.0410	U	0.109	-0.00152	U	0.0807	0.888	U	12.6	0	U	0.144
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	-0.0124	U	0.0931	0.00292	U	0.111	0.0284	U	0.0915	1.96	U	12.8	0	U	0.140
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	-0.0341	U	0.0532	-0.00577	U	0.0788	0.0495	U	0.0675	3.14	U	13.8	-0.00170	U	0.127

Attachment	1	Sheet No.	25 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Plutonium-239/240			Potassium-40			Radium-226			Radium-228			Silver-108 metastable		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.028	U	0.215	12.9		0.766	0.410		0.170	0.619		0.346	0.061	U	0.061
Duplicate of J19YF8	J19YH6	5/13/10	0.03	U	0.230	14.6		1.16	0.488		0.175	1.00		0.326	0.053	U	0.053
OB-1	J19YF4	5/13/10	0.047	U	0.181	12.3		0.865	0.392		0.135	0.681		0.222	0.060	U	0.060
OB-2	J19YF5	5/13/10	0	U	0.227	12.2		0.803	0.386		0.128	0.642		0.285	0.050	U	0.050
OB-3	J19YF6	5/13/10	-0.028	U	0.213	12.2		0.586	0.335		0.122	0.790		0.177	0.046	U	0.046
OB-4	J19YF7	5/13/10	-0.035	U	0.265	14.8		1.08	0.499		0.173	0.856		0.430	0.082	U	0.082
OB-6	J19YF9	5/13/10	0.058	U	0.223	13		0.704	0.444		0.124	0.902		0.282	0.056	U	0.056
OB-7	J19YH0	5/13/10	0	U	0.179	15.2		0.671	0.503		0.143	0.783		0.306	0.047	U	0.047
OB-8	J19YH1	5/13/10	0	U	0.201	11.4		0.642	0.430		0.107	0.673		0.285	0.043	U	0.043
OB-8 re-sample 1[a]	J1FKL6	3/17/11	-0.00397	U	0.165										-0.00434	U	0.0230
OB-9	J19YH2	5/13/10	0.027	U	0.206	12.7		0.689	0.388		0.143	0.472		0.308	0.053	U	0.053
OB-10	J19YH3	5/13/10	0	U	0.180	13.5		0.482	0.418		0.124	0.625		0.210	0.053	U	0.053
OB-11	J19YH4	5/13/10	0	U	0.170	13		0.662	0.505		0.106	1.08		0.210	0.048	U	0.048
OB-12	J19YH5	5/13/10	0	U	0.185	11.6		0.964	0.338		0.162	0.397	U	0.411	0.072	U	0.072
OB-13	J1B4H9	5/17/10	0	U	0.282	13.3		0.215	0.439		0.041	0.637		0.088	0.018	U	0.018
OB-14	J1B4J0	5/17/10	0	U	0.209	13.5		0.576	0.486		0.111	0.847		0.200	0.042	U	0.042
OB-15	J1B4J1	5/17/10	0.0	U	0.242	13		0.434	0.437		0.097	0.794		0.220	0.039	U	0.039
SPA-4	J19YJ0	5/17/10	0.108	U	0.277	12.4		0.709	0.390		0.116	0.557		0.282	0.051	U	0.051
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	-0.00300	U	0.125										0.0143	U	0.065
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0	U	0.107										0.0114	U	0.0461
SPA-1	J19YH7	5/17/10	0.028	U	0.215	12.7		0.574	0.404		0.095	0.608		0.231	0.046	U	0.046
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	-0.00176	U	0.131										0.00263	U	0.0175
SPA-2	J19YH8	5/17/10	0.033	U	0.255	14.8		1.08	0.505		0.239	0.818		0.451	0.080	U	0.080
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0	U	0.196										0.00455	U	0.0249
SPA-3	J19YH9	5/17/10	0.0	U	0.300	15.6		1.11	0.689		0.168	0.842		0.466	0.054	U	0.054
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0	U	0.171										-0.00180	U	0.0226
SPA-5	J19YJ1	5/17/10	0.0	U	0.373	12.3		0.885	0.565		0.109	1.03		0.280	0.053	U	0.053
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	-0.00196	U	0.147										-0.00601	U	0.0637
SPA-6	J19YJ2	5/17/10	0.032	U	0.248	12.3		1.09	0.494		0.205	1.05		0.518	0.092	U	0.092
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	-0.00155	U	0.116										0.00246	U	0.0294
SPA-7	J19YJ3	5/17/10	-0.041	U	0.316	15.6		0.834	0.395		0.138	0.775		0.256	0.047	U	0.047
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0666	U	0.128										-0.00435	U	0.0228
SPA-8	J19YJ4	5/17/10	0	U	0.285	12.3		0.628	0.506		0.140	0.500		0.255	0.054	U	0.054
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.0282	U	0.131										-0.00839	U	0.0228
SPA-9	J19YJ5	5/17/10	0.037	U	0.283	11.8		0.881	0.370		0.159	0.736		0.363	0.056	U	0.056
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0	U	0.133										-0.000774	U	0.028
SPA-10	J19YJ6	5/17/10	0	U	0.302	14.1		1.07	0.832		0.213	1.06		0.474	0.082	U	0.082
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	-0.00384	U	0.160										0.00951	U	0.0267
SPA-11	J19YJ7	5/17/10	0	U	0.247	12.9		0.258	0.496		0.048	0.676		0.098	0.017	U	0.017
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0	U	0.140										0.00815	U	0.0306
SPA-12	J19YJ8	5/17/10	0	U	0.258	14.6		0.43	0.551		0.085	0.750		0.178	0.032	U	0.032
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	-0.00340	U	0.142										-0.00141	U	0.0169
Duplicate of J19YJ4	J19YJ9	5/17/10	0	U	0.267	15.7		0.301	0.567		0.057	0.829		0.137	0.019	U	0.019

Attachment	1	Sheet No.	26 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.003	U	0.383	0.706		0.118	0.619		0.346	-0.031	U	0.231	1.61	U	2.42
Duplicate of J19YF8	J19YH6	5/13/10	0.156	U	0.372	0.944		0.135	1.00		0.326	-0.1	U	0.259	1.88	U	2.6
OB-1	J19YF4	5/13/10	0.071	U	0.385	0.48		0.082	0.681		0.222	-0.046	U	0.204	0.746	U	2.51
OB-2	J19YF5	5/13/10	0.097	U	0.409	0.608		0.125	0.642		0.285	-0.094	U	0.224	2.93		2.68
OB-3	J19YF6	5/13/10	0.124	U	0.381	0.565		0.07	0.79		0.177	0.062	U	0.240	3.04		2.74
OB-4	J19YF7	5/13/10	0.125	U	0.396	0.651		0.224	0.856		0.43	0.01	U	0.214	3.61		2.67
OB-6	J19YF9	5/13/10	0.032	U	0.385	0.845		0.123	0.902		0.282	0.026	U	0.221	0.975	U	2.5
OB-7	J19YH0	5/13/10	0.214	U	0.37	0.644		0.078	0.783		0.306	0.089	U	0.249	2.78		2.59
OB-8	J19YH1	5/13/10	0.004	U	0.452	0.62		0.075	0.673		0.285	-0.051	U	0.291	3.09		2.68
OB-8 re-sample 1[a]	J1FKL6	3/17/11	-0.0128	U	0.642							0.0560	U	0.186	0.00188	U	0.0264
OB-9	J19YH2	5/13/10	0.124	U	0.390	0.651		0.11	0.472		0.308	-0.054	U	0.228	2.22	U	2.44
OB-10	J19YH3	5/13/10	0.005	U	0.380	0.586		0.126	0.625		0.210	-0.019	U	0.225	2.61		2.56
OB-11	J19YH4	5/13/10	0.029	U	0.363	0.738		0.091	1.08		0.210	0.089	U	0.261	0.916	U	2.47
OB-12	J19YH5	5/13/10	0.087	U	0.394	0.530		0.133	0.397	U	0.411	-0.028	U	0.241	0.68	U	2.62
OB-13	J1B4H9	5/17/10	0.087	U	0.443	0.565		0.034	0.637		0.088	-0.096	U	0.356	-0.998	U	7.04
OB-14	J1B4J0	5/17/10	0.082	U	0.419	0.598		0.071	0.847		0.200	-0.052	U	0.305	-1.09	U	7.68
OB-15	J1B4J1	5/17/10	0.059	U	0.443	0.646		0.069	0.794		0.220	-0.001	U	0.348	-2.07	U	7.28
SPA-4	J19YJ0	5/17/10	0.082	U	0.418	0.564		0.094	0.557		0.282	0.088	U	0.325	-1.24	U	7.16
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.165	U	0.607							0.0938	U	0.171	0.00250	U	0.0166
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.177	U	0.626							0.0251	U	0.170	-0.00206	U	0.0161
SPA-1	J19YH7	5/17/10	0.048	U	0.453	0.455		0.064	0.608		0.231	0.013	U	0.289	1.42	U	7.50
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.403	U	0.625							0.0850	U	0.171	0.000742	U	0.0166
SPA-2	J19YH8	5/17/10	0.130	U	0.462	0.525		0.217	0.818		0.451	0.007	U	0.313	-0.359	U	7.59
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.288	U	0.624							0.0101	U	0.167	0.00638	U	0.0156
SPA-3	J19YH9	5/17/10	0.181	U	0.420	1.04		0.108	0.842		0.466	0.053	U	0.265	-2.56	U	7.38
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.520	U	0.617							0.0241	U	0.154	0.00375	U	0.0153
SPA-5	J19YJ1	5/17/10	0.086	U	0.399	0.927		0.137	1.03		0.280	-0.028	U	0.244	-2.27	U	8.46
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.397	U	0.621							0.0856	U	0.178	0.00266	U	0.0248
SPA-6	J19YJ2	5/17/10	0.195	U	0.428	0.687		0.134	1.05		0.518	-0.038	U	0.317	2.46	U	7.44
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.256	U	0.618							0.0207	U	0.173	0.0113	U	0.0278
SPA-7	J19YJ3	5/17/10	0.034	U	0.435	0.697		0.097	0.775		0.256	-0.067	U	0.314	-1.83	U	8.27
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.439	U	0.650							0.0345	U	0.170	0.0167	U	0.0237
SPA-8	J19YJ4	5/17/10	0.012	U	0.420	0.573		0.079	0.500		0.255	0.122	U	0.327	-0.83	U	7.52
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.485	U	0.615							0.0396	U	0.173	0.00300	U	0.0241
SPA-9	J19YJ5	5/17/10	0.086	U	0.417	0.693		0.098	0.736		0.363	0.033	U	0.290	1.25	U	8.79
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.237	U	0.645							0.0531	U	0.173	0.00601	U	0.0336
SPA-10	J19YJ6	5/17/10	0.144	U	0.426	0.666		0.154	1.06		0.474	0.004	U	0.328	-1.06	U	7.45
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.427	U	0.633							0.0381	U	0.166	0.00556	U	0.0140
SPA-11	J19YJ7	5/17/10	0.056	U	0.444	0.7		0.031	0.676		0.098	0.074	U	0.332	-1.64	U	7.42
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.575	U	0.615							0.110	U	0.167	0.00634	U	0.0126
SPA-12	J19YJ8	5/17/10	-0.015	U	0.430	0.756		0.057	0.75		0.178	0.049	U	0.364	-1.72	U	7.77
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.809		0.656							0.0884	U	0.172	0.00631	U	0.0206
Duplicate of J19YJ4	J19YJ9	5/17/10	0.028	U	0.404	0.831		0.036	0.829		0.137	0.013	U	0.296	0.457	U	7.26

Attachment	1	Sheet No.	27 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB-5	J19YF8	5/13/10	0.517		0.172	0.027	U	0.208	0.351	U	0.351	0.427		0.172	12.3	U	12.3
Duplicate of J19YF8	J19YH6	5/13/10	0.579		0.201	0.032	U	0.244	0.432	U	0.432	0.526		0.201	8.91	U	8.91
OB-1	J19YF4	5/13/10	0.541		0.138	0.044	U	0.167	0.337	U	0.337	0.559		0.138	9.69	U	9.69
OB-2	J19YF5	5/13/10	0.494		0.169	0.064	U	0.163	0.425	U	0.425	0.459		0.135	7.07	U	7.07
OB-3	J19YF6	5/13/10	0.401		0.161	0.051	U	0.195	0.329	U	0.329	0.527		0.161	8.15	U	8.15
OB-4	J19YF7	5/13/10	0.598		0.148	0.047	U	0.179	0.626	U	0.626	0.444		0.148	11.9	U	11.9
OB-6	J19YF9	5/13/10	0.620		0.250	0.119	U	0.302	0.376	U	0.376	0.588		0.250	8.91	U	8.91
OB-7	J19YH0	5/13/10	0.558		0.194	0	U	0.235	0.295	U	0.295	0.660		0.194	7.88	U	7.88
OB-8	J19YH1	5/13/10	0.404		0.206	0.033	U	0.249	0.317	U	0.317	0.592		0.206	7.17	U	7.17
OB-8 re-sample 1[a]	J1FKL6	3/17/11	0.138	U	0.177	-0.0119	U	0.154				0.186	U	0.191			
OB-9	J19YH2	5/13/10	0.482		0.194	0.061	U	0.235	0.429	U	0.429	0.508		0.194	8.98	U	8.98
OB-10	J19YH3	5/13/10	0.632		0.186	0.029	U	0.225	0.39	U	0.39	0.292		0.186	7.69	U	7.69
OB-11	J19YH4	5/13/10	0.464		0.209	0.066	U	0.253	0.359	U	0.359	0.628		0.209	7.92	U	7.92
OB-12	J19YH5	5/13/10	0.760		0.224	0.035	U	0.271	0.490	U	0.490	0.731		0.224	11.6	U	11.6
OB-13	J1B4H9	5/17/10	0.495		0.223	0.035	U	0.270	0.144	U	0.144	0.524		0.223	2.6	U	2.6
OB-14	J1B4J0	5/17/10	0.778		0.161	0.051	U	0.195	0.284	U	0.284	0.421		0.161	5.59	U	5.59
OB-15	J1B4J1	5/17/10	-0.008	U	0.046	0.005	U	0.039	0.296	U	0.296	0.013	U	0.032	5.68	U	5.68
SPA-4	J19YJ0	5/17/10	0.366		0.280	0.133	U	0.339	0.370	U	0.370	0.44		0.28	7.81	U	7.81
SPA-4 re-sample 1[a]	J1FKM0	3/17/11	0.127		0.120	-0.00158	U	0.101				0.0772	U	0.101			
Duplicate of J1FKM0[a]	J1FKM9	3/17/11	0.0580	U	0.139	0.0162	U	0.122				0.236		0.163			
SPA-1	J19YH7	5/17/10	0.236		0.164	0.052	U	0.198	0.302	U	0.302	0.279		0.164	7.01	U	7.01
SPA-1 re-sample 1[a]	J1FKL7	3/17/11	0.218		0.142	-0.00464	U	0.111				0.174		0.135			
SPA-2	J19YH8	5/17/10	0.552		0.264	0	U	0.32	0.529	U	0.529	0.345		0.264	12.6	U	12.6
SPA-2 re-sample 1[a]	J1FKL8	3/17/11	0.043	U	0.105	0	U	0.0873				0.115		0.0873			
SPA-3	J19YH9	5/17/10	0.32		0.204	0.065	U	0.247	0.421	U	0.421	0.427		0.204	10.4	U	10.4
SPA-3 re-sample 1[a]	J1FKL9	3/17/11	0.162		0.0870	-0.00116	U	0.087				0.160		0.0970			
SPA-5	J19YJ1	5/17/10	0.488		0.208	0.033	U	0.251	0.359	U	0.359	0.38		0.208	8.44	U	8.44
SPA-5 re-sample 1[a]	J1FKM1	3/17/11	0.138		0.130	0.0551	U	0.109				0.0244	U	0.126			
SPA-6	J19YJ2	5/17/10	0.474		0.202	0.064	U	0.244	0.576	U	0.576	0.791		0.202	12.5	U	12.5
SPA-6 re-sample 1[a]	J1FKM2	3/17/11	0.141	U	0.154	-0.00773	U	0.135				0.132	U	0.180			
SPA-7	J19YJ3	5/17/10	1.01		0.257	0	U	0.312	0.373	U	0.373	0.774		0.257	8.73	U	8.73
SPA-7 re-sample 1[a]	J1FKM3	3/17/11	0.0757	U	0.147	-0.00560	U	0.134				0.130	U	0.153			
SPA-8	J19YJ4	5/17/10	0.85		0.21	0.033	U	0.254	0.413	U	0.413	0.302		0.21	8.54	U	8.54
SPA-8 re-sample 1[a]	J1FKM4	3/17/11	0.207		0.119	0	U	0.0988				0.183		0.0988			
SPA-9	J19YJ5	5/17/10	0.497		0.055	0.024	U	0.044	0.380	U	0.380	0.491		0.036	9.02	U	9.02
SPA-9 re-sample 1[a]	J1FKM5	3/17/11	0.453		0.106	0.0494	U	0.095				0.224		0.114			
SPA-10	J19YJ6	5/17/10	0.436		0.052	0.005	U	0.039	0.551	U	0.551	0.428		0.047	11.4	U	11.4
SPA-10 re-sample 1[a]	J1FKM6	3/17/11	0.187		0.100	-0.00133	U	0.1				0.211		0.112			
SPA-11	J19YJ7	5/17/10	0.496		0.158	0.05	U	0.191	0.145	U	0.145	0.393		0.158	2.76	U	2.76
SPA-11 re-sample 1[a]	J1FKM7	3/17/11	0.141		0.111	-0.00145	U	0.0931				0.0711	U	0.0931			
SPA-12	J19YJ8	5/17/10	0.692		0.165	0	U	0.2	0.203	U	0.203	0.346		0.165	4.64	U	4.64
SPA-12 re-sample 1[a]	J1FKM8	3/17/11	0.0717	U	0.178	0.0756	U	0.150				0.189		0.173			
Duplicate of J19YJ4	J19YJ9	5/17/10	0.33		0.194	0.031	U	0.235	0.148	U	0.148	0.635		0.194	4.79	U	4.79

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Barium-133			Carbon-14			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.269	U	0.269	0.095	U	0.095	0.791	UJ	0.865	0.08	U	0.08	0.085	U	0.085
SZ-11	J19YC8	5/18/10	0.042	U	0.042	0.042	U	0.042	1.24		0.903	0.062	U	0.062	0.033	U	0.033
OB-8	J19YH1	5/13/10	0.149	U	0.149	0.053	U	0.053	0.472	U	0.982	0.063	U	0.063	0.058	U	0.058
SPA-4	J19YJ0	5/17/10	0.178	U	0.178	0.079	U	0.079	-0.029	U	0.489	0.100	U	0.1	0.057	U	0.057
SPA-1	J19YH7	5/17/10	0.124	U	0.124	0.054	U	0.054	-0.091	U	0.496	0.065	U	0.065	0.062	U	0.062
SPA-2	J19YH8	5/17/10	0.12	U	0.12	0.121	U	0.121	-0.085	U	0.534	0.253	U	0.253	0.112	U	0.112
SPA-3	J19YH9	5/17/10	0.107	U	0.107	0.083	U	0.083	0.136	U	0.51	0.234		0.092	0.094	U	0.094
SPA-5	J19YJ1	5/17/10	0.159	U	0.159	0.067	U	0.067	-0.014	U	0.525	0.110		0.077	0.078	U	0.078
SPA-6	J19YJ2	5/17/10	0.128	U	0.128	0.13	U	0.13	0.145	U	0.519	0.307		0.132	0.114	U	0.114
SPA-7	J19YJ3	5/17/10	0.085	U	0.085	0.067	U	0.067	-0.038	U	0.507	0.069	U	0.069	0.081	U	0.081
SPA-8	J19YJ4	5/17/10	0.321	U	0.321	0.098	U	0.098	0.039	U	0.51	0.118	U	0.118	0.067	U	0.067
SPA-9	J19YJ5	5/17/10	0.089	U	0.089	0.092	U	0.092	0.048	U	0.515	0.238		0.09	0.084	U	0.084
SPA-10	J19YJ6	5/17/10	0.115	U	0.115	0.116	U	0.116	0.141	U	0.502	0.333		0.119	0.092	U	0.092
SPA-11	J19YJ7	5/17/10	0.052	U	0.052	0.023	U	0.023	-0.003	U	0.522	0.056		0.028	0.025	U	0.025
SPA-12	J19YJ8	5/17/10	0.045	U	0.045	0.044	U	0.044	-0.046	U	0.503	0.089		0.048	0.039	U	0.039
Duplicate of J19YJ4	J19YJ9	5/17/10	0.035	U	0.035	0.026	U	0.026	-0.064	U	0.497	0.136		0.036	0.031	U	0.031

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Nickel-63			Plutonium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.214	U	0.214	0.299	U	0.299	0.187	U	0.187	-0.352	U	3.08	0	U	0.214
SZ-11	J19YC8	5/18/10	0.098	U	0.098	0.113	U	0.113	0.091	U	0.091	1.73	U	2.86	0	U	0.292
OB-8	J19YH1	5/13/10	0.141	U	0.141	0.195	U	0.195	0.137	U	0.137	-1.38	U	3.28	-0.053	U	0.29
SPA-4	J19YJ0	5/17/10	0.186	U	0.186	0.2	U	0.2	0.177	U	0.177	0.82	U	3.1	0	U	0.347
SPA-1	J19YH7	5/17/10	0.164	U	0.164	0.193	U	0.193	0.128	U	0.128	0.588	U	3.18	0.056	U	0.269
SPA-2	J19YH8	5/17/10	0.291	U	0.291	0.395	U	0.395	0.222	U	0.222	-0.083	U	3.15	0.033	U	0.256
SPA-3	J19YH9	5/17/10	0.255	U	0.255	0.298	U	0.298	0.169	U	0.169	1.58	U	3.42	-0.039	U	0.376
SPA-5	J19YJ1	5/17/10	0.204	U	0.204	0.25	U	0.25	0.164	U	0.164	1.2	U	3.02	0	U	0.373
SPA-6	J19YJ2	5/17/10	0.287	U	0.287	0.355	U	0.355	0.248	U	0.248	1.32	U	3.13	0	U	0.358
SPA-7	J19YJ3	5/17/10	0.197	U	0.197	0.253	U	0.253	0.146	U	0.146	1.08	U	3.14	0.124	U	0.396
SPA-8	J19YJ4	5/17/10	0.181	U	0.181	0.223	U	0.223	0.191	U	0.191	1.15	U	3.63	-0.075	U	0.357
SPA-9	J19YJ5	5/17/10	0.196	U	0.196	0.277	U	0.277	0.188	U	0.188	0.856	U	3.08	0.074	U	0.354
SPA-10	J19YJ6	5/17/10	0.272	U	0.272	0.325	U	0.325	0.251	U	0.251	1.6	U	3.11	-0.04	U	0.302
SPA-11	J19YJ7	5/17/10	0.064	U	0.064	0.085	U	0.085	0.054	U	0.054	0.732	U	3.08	-0.032	U	0.248
SPA-12	J19YJ8	5/17/10	0.104	U	0.104	0.128	U	0.128	0.084	U	0.084	0.22	U	3.33	0.034	U	0.258
Duplicate of J19YJ4	J19YJ9	5/17/10	0.073	U	0.073	0.089	U	0.089	0.057	U	0.057	1.23	U	3	0	U	0.268

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Plutonium-239/240			Potassium-40			Radium-226			Radium-228			Silver-108 metastable		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0	U	0.214	12.5		0.753	0.511		0.132	0.461		0.377	0.066	U	0.066
SZ-9 re-sample 1	J1FKL4	3/16/11	-0.00291	U	0.121										0.00194	U	0.0178
SZ-11	J19YC8	5/18/10	0	U	0.234	15.6		0.392	0.684		0.08	0.868		0.17	0.029	U	0.029
SZ-11 re-sample 1	J1FKL5	3/16/11	-0.00166	U	0.125										-0.0059	U	0.0213
OB-8	J19YH1	5/13/10	0	U	0.201	11.4		0.642	0.43		0.107	0.673		0.285	0.043	U	0.043
OB-8 re-sample 1	J1FKL6	3/17/11	-0.00397	U	0.165										-0.00434	U	0.023
SPA-4	J19YJ0	5/17/10	0.108	U	0.277	12.4		0.709	0.390		0.116	0.557		0.282	0.051	U	0.051
SPA-4 re-sample 1	J1FKM0	3/17/11	-0.00300	U	0.125										0.0143	U	0.065
Duplicate of J1FKM0	J1FKM9	3/17/11	0	U	0.107										0.0114	U	0.0461
SPA-1	J19YH7	5/17/10	0.028	U	0.215	12.7		0.574	0.404		0.095	0.608		0.231	0.046	U	0.046
SPA-1 re-sample 1	J1FKL7	3/17/11	-0.00176	U	0.131										0.00263	U	0.0175
SPA-2	J19YH8	5/17/10	0.033	U	0.255	14.8		1.08	0.505		0.239	0.818		0.451	0.080	U	0.080
SPA-2 re-sample 1	J1FKL8	3/17/11	0	U	0.196										0.00455	U	0.0249
SPA-3	J19YH9	5/17/10	-0.039	U	0.300	15.6		1.11	0.689		0.168	0.842		0.466	0.054	U	0.054
SPA-3 re-sample 1	J1FKL9	3/17/11	0	U	0.171										-0.0018	U	0.0226
SPA-5	J19YJ1	5/17/10	0.049	U	0.373	12.3		0.885	0.565		0.109	1.03		0.280	0.053	U	0.053
SPA-5 re-sample 1	J1FKM1	3/17/11	-0.00196	U	0.147										-0.00601	U	0.0637
SPA-6	J19YJ2	5/17/10	0.032	U	0.248	12.3		1.09	0.494		0.205	1.05		0.518	0.092	U	0.092
SPA-6 re-sample 1	J1FKM2	3/17/11	-0.00155	U	0.116										0.00246	U	0.0294
SPA-7	J19YJ3	5/17/10	-0.041	U	0.316	15.6		0.834	0.395		0.138	0.775		0.256	0.047	U	0.047
SPA-7 re-sample 1	J1FKM3	3/17/11	0.0666	U	0.128										-0.00435	U	0.0228
SPA-8	J19YJ4	5/17/10	0	U	0.285	12.3		0.628	0.506		0.140	0.500		0.255	0.054	U	0.054
SPA-8 re-sample 1	J1FKM4	3/17/11	0.0282	U	0.131										-0.00839	U	0.0228
SPA-9	J19YJ5	5/17/10	0.037	U	0.283	11.8		0.881	0.370		0.159	0.736		0.363	0.056	U	0.056
SPA-9 re-sample 1	J1FKM5	3/17/11	0	U	0.133										-0.000774	U	0.028
SPA-10	J19YJ6	5/17/10	0	U	0.302	14.1		1.07	0.832		0.213	1.06		0.474	0.082	U	0.082
SPA-10 re-sample 1	J1FKM6	3/17/11	-0.00384	U	0.160										0.00951	U	0.0267
SPA-11	J19YJ7	5/17/10	0	U	0.247	12.9		0.258	0.496		0.048	0.676		0.098	0.017	U	0.017
SPA-11 re-sample 1	J1FKM7	3/17/11	0	U	0.140										0.00815	U	0.0306
SPA-12	J19YJ8	5/17/10	0	U	0.258	14.6		0.43	0.551		0.085	0.750		0.178	0.032	U	0.032
SPA-12 re-sample 1	J1FKM8	3/17/11	-0.0034	U	0.142										-0.00141	U	0.0169
Duplicate of J19YJ4	J19YJ9	5/17/10	0	U	0.267	15.7		0.301	0.567		0.057	0.829		0.137	0.019	U	0.019

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Technetium-99			Thorium-228 GEA			Thorium-232 GEA			Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.133	U	0.414	0.642		0.1	0.461		0.377	-0.065	U	0.309	3.19	J	2.62
SZ-9 re-sample 1	J1FKL4	3/16/11	0.283	U	0.639							-0.0679	U	0.174	0.0527		0.0245
SZ-11	J19YC8	5/18/10	-0.091	U	0.37	0.73		0.055	0.868		0.17	0.113	U	0.235	0.097	U	2.99
SZ-11 re-sample 1	J1FKL5	3/16/11	0.467	U	0.644							-0.0415	U	0.193	0.0530		0.0137
OB-8	J19YH1	5/13/10	0.004	U	0.452	0.62		0.075	0.673		0.285	-0.051	U	0.291	3.09		2.68
OB-8 re-sample 1	J1FKL6	3/17/11	-0.0128	U	0.642							0.0560	U	0.186	0.00188	U	0.0264
SPA-4	J19YJ0	5/17/10	0.082	U	0.418	0.564		0.094	0.557		0.282	0.088	U	0.325	-1.24	U	7.16
SPA-4 re-sample 1	J1FKM0	3/17/11	0.165	U	0.607							0.0938	U	0.171	0.00250	U	0.0166
Duplicate of J1FKM0	J1FKM9	3/17/11	0.177	U	0.626							0.0251	U	0.170	-0.00206	U	0.0161
SPA-1	J19YH7	5/17/10	0.048	U	0.453	0.455		0.064	0.608		0.231	0.013	U	0.289	1.42	U	7.5
SPA-1 re-sample 1	J1FKL7	3/17/11	0.403	U	0.625							0.0850	U	0.171	0.000742	U	0.0166
SPA-2	J19YH8	5/17/10	0.130	U	0.462	0.525		0.217	0.818		0.451	0.007	U	0.313	-0.359	U	7.59
SPA-2 re-sample 1	J1FKL8	3/17/11	0.288	U	0.624							0.0101	U	0.167	0.00638	U	0.0156
SPA-3	J19YH9	5/17/10	0.181	U	0.420	1.04		0.108	0.842		0.466	0.053	U	0.265	-2.56	U	7.38
SPA-3 re-sample 1	J1FKL9	3/17/11	0.520	U	0.617							0.0241	U	0.154	0.00375	U	0.0153
SPA-5	J19YJ1	5/17/10	0.086	U	0.399	0.927		0.137	1.03		0.280	-0.028	U	0.244	-2.27	U	8.46
SPA-5 re-sample 1	J1FKM1	3/17/11	0.397	U	0.621							0.0856	U	0.178	0.00266	U	0.0248
SPA-6	J19YJ2	5/17/10	0.195	U	0.428	0.687		0.134	1.05		0.518	-0.038	U	0.317	2.46	U	7.44
SPA-6 re-sample 1	J1FKM2	3/17/11	0.256	U	0.618							0.0207	U	0.173	0.0113	U	0.0278
SPA-7	J19YJ3	5/17/10	0.034	U	0.435	0.697		0.097	0.775		0.256	-0.067	U	0.314	-1.83	U	8.27
SPA-7 re-sample 1	J1FKM3	3/17/11	0.439	U	0.65							0.0345	U	0.170	0.0167	U	0.0237
SPA-8	J19YJ4	5/17/10	0.012	U	0.420	0.573		0.079	0.500		0.255	0.122	U	0.327	-0.83	U	7.52
SPA-8 re-sample 1	J1FKM4	3/17/11	0.485	U	0.615							0.0396	U	0.173	0.00300	U	0.0241
SPA-9	J19YJ5	5/17/10	0.086	U	0.417	0.693		0.098	0.736		0.363	0.033	U	0.290	1.25	U	8.79
SPA-9 re-sample 1	J1FKM5	3/17/11	0.237	U	0.645							0.0531	U	0.173	0.00601	U	0.0336
SPA-10	J19YJ6	5/17/10	0.144	U	0.426	0.666		0.154	1.06		0.474	0.004	U	0.328	-1.06	U	7.45
SPA-10 re-sample 1	J1FKM6	3/17/11	0.427	U	0.633							0.0381	U	0.166	0.00556	U	0.0140
SPA-11	J19YJ7	5/17/10	0.056	U	0.444	0.7		0.031	0.676		0.098	0.074	U	0.332	-1.64	U	7.42
SPA-11 re-sample 1	J1FKM7	3/17/11	0.575	U	0.615							0.110	U	0.167	0.00634	U	0.0126
SPA-12	J19YJ8	5/17/10	-0.015	U	0.430	0.756		0.057	0.75		0.178	0.049	U	0.364	-1.72	U	7.77
SPA-12 re-sample 1	J1FKM8	3/17/11	0.809		0.656							0.0884	U	0.172	0.00631	U	0.0206
Duplicate of J19YJ4	J19YJ9	5/17/10	0.028	U	0.404	0.831		0.036	0.829		0.137	0.013	U	0.296	0.457	U	7.26

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Attachment 1. 116-H-5 Waste Site Verification Sample Results Replaced Data. For Information Only.

Sample Location	HEIS Number	Sample Date	Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SZ-9	J19YC6	5/18/10	0.575		0.259	0.041	U	0.314	0.380	U	0.380	0.542		0.259	10.4	U	10.4
SZ-9 re-sample 1	J1FKL4	3/16/11	0.0792	U	0.114	-0.00137	U	0.102				0.214		0.123			
SZ-11	J19YC8	5/18/10	0.688		0.176	0.028	U	0.213	0.200	U	0.200	0.551		0.176	4.10	U	4.10
SZ-11 re-sample 1	J1FKL5	3/16/11	0.196		0.123	-0.00163	U	0.123				0.454		0.137			
OB-8	J19YH1	5/13/10	0.404		0.206	0.033	U	0.249	0.317	U	0.317	0.592		0.206	7.17	U	7.17
OB-8 re-sample 1	J1FKL6	3/17/11	0.138	U	0.177	-0.0119	U	0.154				0.186	U	0.191			
SPA-4	J19YJ0	5/17/10	0.366		0.280	0.133	U	0.339	0.370	U	0.370	0.44		0.28	7.81	U	7.81
SPA-4 re-sample 1	J1FKM0	3/17/11	0.127		0.120	-0.00158	U	0.101				0.0772	U	0.101			
Duplicate of J1FKM0	J1FKM9	3/17/11	0.058	U	0.139	0.0162	U	0.122				0.236		0.163			
SPA-1	J19YH7	5/17/10	0.236		0.164	0.052	U	0.198	0.302	U	0.302	0.279		0.164	7.01	U	7.01
SPA-1 re-sample 1	J1FKL7	3/17/11	0.218		0.142	-0.00464	U	0.111				0.174		0.135			
SPA-2	J19YH8	5/17/10	0.552		0.264	0	U	0.32	0.529	U	0.529	0.345		0.264	12.6	U	12.6
SPA-2 re-sample 1	J1FKL8	3/17/11	0.043	U	0.105	0	U	0.0873				0.115		0.0873			
SPA-3	J19YH9	5/17/10	0.32		0.204	0.065	U	0.247	0.421	U	0.421	0.427		0.204	10.4	U	10.4
SPA-3 re-sample 1	J1FKL9	3/17/11	0.162		0.087	-0.00116	U	0.087				0.16		0.097			
SPA-5	J19YJ1	5/17/10	0.488		0.208	0.033	U	0.251	0.359	U	0.359	0.38		0.208	8.44	U	8.44
SPA-5 re-sample 1	J1FKM1	3/17/11	0.138		0.130	0.0551	U	0.109				0.0244	U	0.126			
SPA-6	J19YJ2	5/17/10	0.474		0.202	0.064	U	0.244	0.576	U	0.576	0.791		0.202	12.5	U	12.5
SPA-6 re-sample 1	J1FKM2	3/17/11	0.141	U	0.154	-0.00773	U	0.135				0.132	U	0.18			
SPA-7	J19YJ3	5/17/10	1.01		0.257	0	U	0.312	0.373	U	0.373	0.774		0.257	8.73	U	8.73
SPA-7 re-sample 1	J1FKM3	3/17/11	0.0757	U	0.147	-0.0056	U	0.134				0.13	U	0.153			
SPA-8	J19YJ4	5/17/10	0.85		0.21	0.033	U	0.254	0.413	U	0.413	0.302		0.21	8.54	U	8.54
SPA-8 re-sample 1	J1FKM4	3/17/11	0.207		0.119	0	U	0.0988				0.183		0.0988			
SPA-9	J19YJ5	5/17/10	0.497		0.055	0.024	U	0.044	0.380	U	0.380	0.491		0.036	9.02	U	9.02
SPA-9 re-sample 1	J1FKM5	3/17/11	0.453		0.106	0.0494	U	0.095				0.224		0.114			
SPA-10	J19YJ6	5/17/10	0.436		0.052	0.005	U	0.039	0.551	U	0.551	0.428		0.047	11.4	U	11.4
SPA-10 re-sample 1	J1FKM6	3/17/11	0.187		0.100	-0.00133	U	0.1				0.211		0.112			
SPA-11	J19YJ7	5/17/10	0.496		0.158	0.05	U	0.191	0.145	U	0.145	0.393		0.158	2.76	U	2.76
SPA-11 re-sample 1	J1FKM7	3/17/11	0.141		0.111	-0.00145	U	0.0931				0.0711	U	0.0931			
SPA-12	J19YJ8	5/17/10	0.692		0.165	0	U	0.2	0.203	U	0.203	0.346		0.165	4.64	U	4.64
SPA-12 re-sample 1	J1FKM8	3/17/11	0.0717	U	0.178	0.0756	U	0.15				0.189		0.173			
Duplicate of J19YJ4	J19YJ9	5/17/10	0.33		0.194	0.031	U	0.235	0.148	U	0.148	0.635		0.194	4.79	U	4.79

Attachment	1	Sheet No.	33 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-2 - J19YB9			Duplicate of J19YB9 - J19YD0			SZ-1 - J19YB8			SZ-3 - J19YC0			SZ-4 - J19YC1		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	2.79	J	3.48
Acenaphthylene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	3.48	U	3.48
Anthracene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	3.48	U	3.48
Benzo(a)anthracene	PAH	3.87	U	3.87	0.858	J	3.43	1.05	J	3.51	4.71		3.36	7.32		3.48
Benzo(a)pyrene	PAH	3.87	U	3.87	1.20	J	3.43	3.51	U	3.51	5.05		3.36	6.97		3.48
Benzo(b)fluoranthene	PAH	1.16	J	3.87	1.54	J	3.43	0.878	J	3.51	6.73		3.36	11.3		3.48
Benzo(ghi)perylene	PAH	3.87	U	3.87	1.03	J	3.43	3.51	U	3.51	3.87		3.36	3.48	U	3.48
Benzo(k)fluoranthene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	2.52	J	3.36	3.49		3.48
Chrysene	PAH	3.87	U	3.87	3.43	U	3.43	1.05	J	3.51	5.38		3.36	8.37		3.48
Dibenz[a,h]anthracene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	2.62	J	3.48
Fluoranthene	PAH	3.87	U	3.87	2.57	J	3.43	2.46	J	3.51	21.4		3.36	19.9		3.48
Fluorene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	3.36	U	3.36	3.48	U	3.48
Indeno(1,2,3-cd)pyrene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	4.54		3.36	7.15		3.48
Naphthalene	PAH	3.87	U	3.87	3.43	U	3.43	3.51	U	3.51	15.0		3.36	3.48	U	3.48
Phenanthrene	PAH	1.16	J	3.87	1.2	J	3.43	1.58	J	3.51	7.57		3.36	5.93		3.48
Pyrene	PAH	3.87	U	3.87	3.43	U	3.43	1.23	J	3.51	14.5		3.36	17.3		3.48
Aroclor-1016	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1221	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1232	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1242	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1248	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1254	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	13.4	U	13.4	13.8	U	13.8
Aroclor-1260	PCB	14.6	U	14.6	13.7	U	13.7	13.8	U	13.8	3.85	J	13.4	13.8	U	13.8
Aldrin	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Alpha-BHC	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
alpha-Chlordane	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Beta-BHC	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Delta-BHC	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
4,4'-DDD	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
4,4'-DDE	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
4,4'-DDT	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Dieldrin	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endosulfan I	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endosulfan II	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endosulfan sulfate	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endrin	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endrin aldehyde	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Endrin ketone	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Gamma-BHC (Lindane)	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
gamma-Chlordane	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Heptachlor	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Heptachlor epoxide	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Methoxychlor	PEST	1.46	UD	1.46	1.37	UD	1.37	1.38	UD	1.38	1.34	UD	1.34	1.39	UD	1.39
Toxaphene	PEST	21.9	UJD	21.9	20.6	UD	20.6	20.7	UJD	20.7	20.1	UJD	20.1	20.8	UJD	20.8

Attachment	1	Sheet No.	34 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-5 - J19YC2			SZ-6 - J19YC3			SZ-7 - J19YC4			SZ-8 - J19YC5			SZ-9 - J19YC6		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.52	U	3.52	3.45	U	3.45	3.49	U	3.49	3.46	U	3.46	3.51	U	3.51
Acenaphthylene	PAH	3.52	U	3.52	3.45	U	3.45	3.49	U	3.49	3.46	U	3.46	3.51	U	3.51
Anthracene	PAH	3.52	U	3.52	3.45	U	3.45	2.45	J	3.49	1.04	J	3.46	4.21		3.51
Benzo(a)anthracene	PAH	8.99		3.52	3.11	J	3.45	11.2		3.49	6.59		3.46	47.4		3.51
Benzo(a)pyrene	PAH	8.99		3.52	3.98		3.45	11.4		3.49	8.15		3.46	414		3.51
Benzo(b)fluoranthene	PAH	9.17		3.52	7.95		3.45	18.4		3.49	12		3.46	51.2		3.51
Benzo(ghi)perylene	PAH	6.52		3.52	3.63		3.45	10.1		3.49	9.36		3.46	24.7		3.51
Benzo(k)fluoranthene	PAH	3.88		3.52	1.73	J	3.45	5.77		3.49	3.99		3.46	16.5		3.51
Chrysene	PAH	11.5		3.52	2.94	J	3.45	16.4		3.49	4.68		3.46	70.9		3.51
Dibenz[a,h]anthracene	PAH	1.23	J	3.52	3.45	U	3.45	2.1	J	3.49	1.56	J	3.46	3.69		3.51
Fluoranthene	PAH	31.2		3.52	9.34		3.45	27.1		3.49	25		3.46	102		3.51
Fluorene	PAH	3.52	U	3.52	3.45	U	3.45	1.57	J	3.49	0.867	J	3.46	3.51	U	3.51
Indeno(1,2,3-cd)pyrene	PAH	6.7		3.52	5.01		3.45	9.97		3.49	8.32		3.46	3.51	U	3.51
Naphthalene	PAH	3.52	U	3.52	3.45	U	3.45	3.49	U	3.49	3.46	U	3.46	3.51	U	3.51
Phenanthrene	PAH	11.6		3.52	3.98		3.45	10.5		3.49	9.88		3.46	33.7		3.51
Pyrene	PAH	23.1		3.52	6.4		3.45	29.4		3.49	16.5		3.46	91.8		3.51
Aroclor-1016	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1221	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1232	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1242	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1248	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1254	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aroclor-1260	PCB	13.5	U	13.5	13.7	U	13.7	13.6	U	13.6	13.7	U	13.7	13.9	U	13.9
Aldrin	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Alpha-BHC	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
alpha-Chlordane	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Beta-BHC	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Delta-BHC	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
4,4'-DDD	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
4,4'-DDE	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.81	JD	1.81
4,4'-DDT	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	2.89	JD	2.89
Dieldrin	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endosulfan I	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endosulfan II	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endosulfan sulfate	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endrin	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endrin aldehyde	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Endrin ketone	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Gamma-BHC (Lindane)	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
gamma-Chlordane	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Heptachlor	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Heptachlor epoxide	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Methoxychlor	PEST	1.35	UD	1.35	1.37	UD	1.37	1.36	UD	1.36	1.37	UD	1.37	1.39	UD	1.39
Toxaphene	PEST	20.2	UJD	20.2	20.6	UJD	20.6	20.4	UJD	20.4	20.5	UJD	20.5	20.9	UD	20.9

Attachment	1	Sheet No.	35 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-9 re-sample 1, J1FKL4			SZ-10 - J19YC7			SZ-11 - J19YC8			SZ-11 re-sample 1, J1FKL5			SZ-12 - J19YC9		
		3/16/11			5/18/10			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	11	U	11	3.43	U	3.43	17.1	U	17.1	10	U	10	3.4	U	3.4
Acenaphthylene	PAH	9.5	U	9.5	3.43	U	3.43	17.1	U	17.1	9.0	U	9.0	3.4	U	3.4
Anthracene	PAH	3.2	U	3.2	2.23	J	3.43	84.5	D	17.1	7.6	J	3.1	3.4	U	3.4
Benzo(a)anthracene	PAH	10	J	3.4	15.5		3.43	512	D	17.1	23		3.2	3.4	U	3.4
Benzo(a)pyrene	PAH	11	J	6.8	15.8		3.43	640	D	17.1	18		6.4	1.19	J	3.4
Benzo(b)fluoranthene	PAH	5.7	JX	4.4	24.9		3.43	549	D	17.1	20		4.2	1.19	J	3.4
Benzo(ghi)perylene	PAH	7.6	U	7.6	23.4		3.43	306	D	17.1	7.2	U	7.2	3.4	U	3.4
Benzo(k)fluoranthene	PAH	5.8	J	4.2	8.59		3.43	262	D	17.1	10	J	4.0	3.4	U	3.4
Chrysene	PAH	10	J	5.1	12.2		3.43	425	D	17.1	18	J	4.9	0.851	J	3.4
Dibenz[a,h]anthracene	PAH	12	U	12	2.75	J	3.43	82.6	D	17.1	11	U	11	3.4	U	3.4
Fluoranthene	PAH	14	U	14	38.5		3.43	1040	D	17.1	48		13	3.06	J	3.4
Fluorene	PAH	5.6	U	5.6	1.03	J	3.43	43.5	D	17.1	5.3	U	5.3	3.4	U	3.4
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	16.8		3.43	17.1	U	17.1	14	J	12	3.4	U	3.4
Naphthalene	PAH	13	U	13	3.43	U	3.43	51.2	D	17.1	12	U	12	3.4	U	3.4
Phenanthrene	PAH	13	U	13	10.8		3.43	325	D	17.1	31	J	12	1.53	J	3.4
Pyrene	PAH	14	J	13	39.4		3.43	944	D	17.1	47		12	3.4	U	3.4
Aroclor-1016	PCB	2.9	U	2.9	13.5	U	13.5	13.8	U	13.8	2.8	U	2.8	13.7	U	13.7
Aroclor-1221	PCB	8.4	U	8.4	13.5	U	13.5	13.8	U	13.8	8.2	U	8.2	13.7	U	13.7
Aroclor-1232	PCB	2.1	U	2.1	13.5	U	13.5	13.8	U	13.8	2.0	U	2.0	13.7	U	13.7
Aroclor-1242	PCB	4.9	U	4.9	13.5	U	13.5	13.8	U	13.8	4.8	U	4.8	13.7	U	13.7
Aroclor-1248	PCB	4.9	U	4.9	13.5	U	13.5	13.8	U	13.8	4.8	U	4.8	13.7	U	13.7
Aroclor-1254	PCB	2.7	U	2.7	13.5	U	13.5	13.8	U	13.8	2.7	U	2.7	13.7	U	13.7
Aroclor-1260	PCB	2.7	U	2.7	13.5	U	13.5	13.8	U	13.8	2.7	U	2.7	13.7	U	13.7
Aldrin	PEST	0.26	U	0.26	1.36	UD	1.36	1.38	UD	1.38	0.26	U	0.26	1.37	UD	1.37
Alpha-BHC	PEST	0.23	U	0.23	1.36	UD	1.36	1.38	UD	1.38	0.22	U	0.22	1.37	UD	1.37
alpha-Chlordane	PEST	0.34	U	0.34	1.36	UD	1.36	1.38	UD	1.38	0.33	U	0.33	1.37	UD	1.37
Beta-BHC	PEST	0.70	U	0.70	1.36	UD	1.36	1.38	UD	1.38	0.67	U	0.67	1.37	UD	1.37
Delta-BHC	PEST	0.42	U	0.42	1.36	UD	1.36	1.38	UD	1.38	0.41	U	0.41	1.37	UD	1.37
4,4'-DDD	PEST	0.58	U	0.58	1.36	UD	1.36	2.18	JD	2.18	0.55	U	0.55	1.37	UD	1.37
4,4'-DDE	PEST	0.25	U	0.25	1.36	UD	1.36	6.29	D	6.29	0.45	J	0.24	1.37	UD	1.37
4,4'-DDT	PEST	0.62	U	0.62	1.36	UD	1.36	2.59	JD	2.59	0.60	U	0.60	1.37	UD	1.37
Dieldrin	PEST	0.22	U	0.22	1.36	UD	1.36	1.38	UD	1.38	0.21	U	0.21	1.37	UD	1.37
Endosulfan I	PEST	0.19	U	0.19	1.36	UD	1.36	1.38	UD	1.38	0.18	U	0.18	1.37	UD	1.37
Endosulfan II	PEST	0.30	U	0.30	1.36	UD	1.36	1.38	UD	1.38	0.29	U	0.29	1.37	UD	1.37
Endosulfan sulfate	PEST	0.29	U	0.29	1.36	UD	1.36	1.38	UD	1.38	0.28	U	0.28	1.37	UD	1.37
Endrin	PEST	0.32	U	0.32	1.36	UD	1.36	1.38	UD	1.38	0.31	U	0.31	1.37	UD	1.37
Endrin aldehyde	PEST	0.18	U	0.18	1.36	UD	1.36	1.38	UD	1.38	0.17	U	0.17	1.37	UD	1.37
Endrin ketone	PEST	0.52	U	0.52	1.36	UD	1.36	1.38	UD	1.38	0.50	U	0.50	1.37	UD	1.37
Gamma-BHC (Lindane)	PEST	0.49	U	0.49	1.36	UD	1.36	1.38	UD	1.38	0.47	U	0.47	1.37	UD	1.37
gamma-Chlordane	PEST	0.28	U	0.28	1.36	UD	1.36	1.38	UD	1.38	0.27	U	0.27	1.37	UD	1.37
Heptachlor	PEST	0.23	U	0.23	1.36	UD	1.36	1.38	UD	1.38	0.22	U	0.22	1.37	UD	1.37
Heptachlor epoxide	PEST	0.45	U	0.45	1.36	UD	1.36	1.38	UD	1.38	0.43	U	0.43	1.37	UD	1.37
Methoxychlor	PEST	0.47	U	0.47	1.36	UD	1.36	1.38	UD	1.38	0.46	U	0.46	1.37	UD	1.37
Toxaphene	PEST	17	U	17	20.4	UJD	20.4	20.7	UD	20.7	16	U	16	20.6	UD	20.6

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-1 - J19YD1			DZ-1 re-sample 1, J1FKK1			DZ-1 re-sample 2, J1HH80			DZ-2 - J19YD2			DZ-2 re-sample 1, J1FKK2		
		5/18/10			3/16/11			4/13/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10.1		3.48	10	U	10	11	U	11	3.51	U	3.51	11	U	11
Acenaphthylene	PAH	3.48	U	3.48	9.3	U	9.3	9.6	U	9.6	3.51	U	3.51	9.6	U	9.6
Anthracene	PAH	3.48	U	3.48	3.1	U	3.1	5.1	J	3.3	3.51	U	3.51	3.3	U	3.3
Benzo(a)anthracene	PAH	5.76		3.48	18		3.3	32		3.4	3.69		3.51	30		3.4
Benzo(a)pyrene	PAH	5.93		3.48	19		6.6	27		6.9	2.46	J	3.51	25		6.8
Benzo(b)fluoranthene	PAH	8.89		3.48	20		4.3	27		4.5	3.86		3.51	29		4.5
Benzo(ghi)perylene	PAH	5.23		3.48	7.4	U	7.4	16	J	7.7	2.28	J	3.51	7.7	U	7.7
Benzo(k)fluoranthene	PAH	2.79	J	3.48	8.6	J	4.1	13	J	4.2	1.41	J	3.51	16		4.2
Chrysene	PAH	9.42		3.48	17	J	5.0	26	J	5.2	5.62		3.51	27	J	5.2
Dibenz[a,h]anthracene	PAH	3.48	U	3.48	11	U	11	12	U	12	3.51	U	3.51	12	U	12
Fluoranthene	PAH	14.1		3.48	13	U	13	43		14	9.13		3.51	45		14
Fluorene	PAH	3.48	U	3.48	5.4	U	5.4	5.7	U	5.7	3.51	U	3.51	5.6	U	5.6
Indeno(1,2,3-cd)pyrene	PAH	3.48	U	3.48	15	J	12	19	J	13	2.28	J	3.51	20	J	13
Naphthalene	PAH	3.48	U	3.48	12	U	12	13	U	13	3.51	U	3.51	13	U	13
Phenanthrene	PAH	5.58		3.48	12	J	12	18	J	13	3.16	J	3.51	15	J	13
Pyrene	PAH	12.9		3.48	31	J	12	48		13	7.2		3.51	51		13
Aroclor-1016	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1221	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1232	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1242	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1248	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1254	PCB	13.7	U	13.7							13.1	U	13.1			
Aroclor-1260	PCB	13.7	U	13.7							13.1	U	13.1			
Aldrin	PEST	1.37	UD	1.37							1.31	UD	1.31			
Alpha-BHC	PEST	1.37	UD	1.37							1.31	UD	1.31			
alpha-Chlordane	PEST	1.37	UD	1.37							1.31	UD	1.31			
Beta-BHC	PEST	1.37	UD	1.37							1.31	UD	1.31			
Delta-BHC	PEST	1.37	UD	1.37							1.31	UD	1.31			
4,4'-DDD	PEST	1.37	UD	1.37							1.31	UD	1.31			
4,4'-DDE	PEST	1.37	UD	1.37							1.31	UD	1.31			
4,4'-DDT	PEST	1.37	UD	1.37							1.31	UD	1.31			
Dieldrin	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endosulfan I	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endosulfan II	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endosulfan sulfate	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endrin	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endrin aldehyde	PEST	1.37	UD	1.37							1.31	UD	1.31			
Endrin ketone	PEST	1.37	UD	1.37							1.31	UD	1.31			
Gamma-BHC (Lindane)	PEST	1.37	UD	1.37							1.31	UD	1.31			
gamma-Chlordane	PEST	1.37	UD	1.37							1.31	UD	1.31			
Heptachlor	PEST	1.37	UD	1.37							1.31	UD	1.31			
Heptachlor epoxide	PEST	1.37	UD	1.37							1.31	UD	1.31			
Methoxychlor	PEST	1.37	UD	1.37							1.31	UD	1.31			
Toxaphene	PEST	20.6	UJD	20.6							19.6	UJD	19.6			

Attachment	1	Sheet No.	37 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-2 re-sample 2, J1HH81			DZ-3 - J19YD3			DZ-3 re-sample 1, J1FKK3			DZ-3 re-sample 2, J1HH82			DZ-4 - J19YD4		
		4/13/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	3.56	U	3.56	12	U	12	9.9	U	9.9	6.88		3.52
Acenaphthylene	PAH	9.1	U	9.1	3.56	U	3.56	11	U	11	8.9	U	8.9	3.52	U	3.52
Anthracene	PAH	3.1	U	3.1	0.891	J	3.56	3.6	U	3.6	3.0	U	3.0	1.41	J	3.52
Benzo(a)anthracene	PAH	3.2	U	3.2	21.2		3.56	9.3	J	3.8	3.1	U	3.1	14.5		3.52
Benzo(a)pyrene	PAH	6.4	U	6.4	17.8		3.56	14	J	7.6	6.3	U	6.3	15.7		3.52
Benzo(b)fluoranthene	PAH	4.2	U	4.2	33.7		3.56	12	J	5.0	4.1	U	4.1	25.8		3.52
Benzo(ghi)perylene	PAH	7.2	U	7.2	13.9		3.56	8.5	U	8.5	7.1	U	7.1	13.2		3.52
Benzo(k)fluoranthene	PAH	4.0	U	4.0	11.4		3.56	5.6	J	4.7	3.9	U	3.9	8.82		3.52
Chrysene	PAH	4.9	U	4.9	21.6		3.56	12	J	5.7	4.8	U	4.8	35.1		3.52
Dibenz[a,h]anthracene	PAH	11	U	11	2.5	J	3.56	13	U	13	11	U	11	2.65	J	3.52
Fluoranthene	PAH	13	U	13	42.8		3.56	15	U	15	13	U	13	40		3.52
Fluorene	PAH	5.3	U	5.3	3.56	U	3.56	6.3	U	6.3	5.2	U	5.2	2.12	J	3.52
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	14.3		3.56	14	U	14	12	U	12	12.5		3.52
Naphthalene	PAH	12	U	12	3.56	U	3.56	14	U	14	12	U	12	3.52	U	3.52
Phenanthrene	PAH	12	U	12	6.77		3.56	14	U	14	12	U	12	9.17		3.52
Pyrene	PAH	12	U	12	46.7		3.56	18	J	14	12	U	12	34.2		3.52
Aroclor-1016	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1221	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1232	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1242	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1248	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1254	PCB				13.9	U	13.9							13.8	U	13.8
Aroclor-1260	PCB				7.31	J	13.9							13.8	U	13.8
Aldrin	PEST				1.39	UD	1.39							1.39	UD	1.39
Alpha-BHC	PEST				1.39	UD	1.39							1.39	UD	1.39
alpha-Chlordane	PEST				1.39	UD	1.39							1.39	UD	1.39
Beta-BHC	PEST				1.39	UD	1.39							1.39	UD	1.39
Delta-BHC	PEST				1.39	UD	1.39							1.39	UD	1.39
4,4'-DDD	PEST				2.12	JD	1.39							1.39	UD	1.39
4,4'-DDE	PEST				1.39	UD	1.39							1.39	UD	1.39
4,4'-DDT	PEST				3.1	JD	1.39							1.39	UD	1.39
Dieldrin	PEST				1.39	UD	1.39							1.39	UD	1.39
Endosulfan I	PEST				1.39	UD	1.39							1.39	UD	1.39
Endosulfan II	PEST				1.39	UD	1.39							1.39	UD	1.39
Endosulfan sulfate	PEST				1.39	UD	1.39							1.39	UD	1.39
Endrin	PEST				1.39	UD	1.39							1.39	UD	1.39
Endrin aldehyde	PEST				1.39	UD	1.39							1.39	UD	1.39
Endrin ketone	PEST				1.39	UD	1.39							1.39	UD	1.39
Gamma-BHC (Lindane)	PEST				1.39	UD	1.39							1.39	UD	1.39
gamma-Chlordane	PEST				1.39	UD	1.39							1.39	UD	1.39
Heptachlor	PEST				1.39	UD	1.39							1.39	UD	1.39
Heptachlor epoxide	PEST				1.39	UD	1.39							1.39	UD	1.39
Methoxychlor	PEST				1.39	UD	1.39							1.39	UD	1.39
Toxaphene	PEST				20.9	UJD	20.9							20.8	UJD	20.8

Attachment	1	Sheet No.	38 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-4 re-sample 1, J1FKK4			DZ-4 re-sample 2, J1HH83			DZ-5 - J19YD5			DZ-5 re-sample 1, J1FKK5			DZ-6 - J19YD6		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	5.98		3.52	10	U	10	3.51	U	3.51
Acenaphthylene	PAH	9.2	U	9.2	9.0	U	9.0	3.52	U	3.52	9.3	U	9.3	3.51	U	3.51
Anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.52	U	3.52	3.2	U	3.2	12.8		3.51
Benzo(a)anthracene	PAH	23	X	3.3	54		3.2	5.46		3.52	3.3	U	3.3	69.1		3.51
Benzo(a)pyrene	PAH	16		6.5	41		6.4	5.1		3.52	6.6	U	6.6	61.7		3.51
Benzo(b)fluoranthene	PAH	13	JX	4.3	51		4.2	6.51		3.52	4.3	U	4.3	88.4		3.51
Benzo(ghi)perylene	PAH	7.3	U	7.3	32		7.2	4.58		3.52	7.4	U	7.4	41.1		3.51
Benzo(k)fluoranthene	PAH	12	J	4.0	30		4.0	2.46	J	3.52	4.1	U	4.1	33.2		3.51
Chrysene	PAH	22	J	4.9	45		4.9	4.58		3.52	5.0	U	5.0	65		3.51
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	3.52	U	3.52	11	U	11	9.49		3.51
Fluoranthene	PAH	40	J	13	69		13	18		3.52	13	U	13	211		3.51
Fluorene	PAH	5.4	U	5.4	5.3	U	5.3	3.52	U	3.52	5.5	U	5.5	5.27		3.51
Indeno(1,2,3-cd)pyrene	PAH	13	J	12	35		12	3.34	J	3.52	12	U	12	46.1		3.51
Naphthalene	PAH	12	U	12	12	U	12	3.52	U	3.52	12	U	12	3.51	U	3.51
Phenanthrene	PAH	12	U	12	17	J	12	6.51		3.52	12	U	12	50.5		3.51
Pyrene	PAH	41		12	77		12	12.3		3.52	12	U	12	194		3.51
Aroclor-1016	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1221	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1232	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1242	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1248	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1254	PCB							13.3	U	13.3				13.9	U	13.9
Aroclor-1260	PCB							13.3	U	13.3				13.9	U	13.9
Aldrin	PEST							1.33	UD	1.33				1.4	UD	1.4
Alpha-BHC	PEST							1.33	UD	1.33				1.4	UD	1.4
alpha-Chlordane	PEST							1.33	UD	1.33				1.4	UD	1.4
Beta-BHC	PEST							1.33	UD	1.33				1.4	UD	1.4
Delta-BHC	PEST							1.33	UD	1.33				1.4	UD	1.4
4,4'-DDD	PEST							1.33	UD	1.33				1.4	UD	1.4
4,4'-DDE	PEST							1.33	UD	1.33				1.4	UD	1.4
4,4'-DDT	PEST							1.33	UD	1.33				1.4	UD	1.4
Dieldrin	PEST							1.33	UD	1.33				1.4	UD	1.4
Endosulfan I	PEST							1.33	UD	1.33				1.4	UD	1.4
Endosulfan II	PEST							1.33	UD	1.33				1.4	UD	1.4
Endosulfan sulfate	PEST							1.33	UD	1.33				1.4	UD	1.4
Endrin	PEST							1.33	UD	1.33				1.4	UD	1.4
Endrin aldehyde	PEST							1.33	UD	1.33				1.4	UD	1.4
Endrin ketone	PEST							1.33	UD	1.33				1.4	UD	1.4
Gamma-BHC (Lindane)	PEST							1.33	UD	1.33				1.4	UD	1.4
gamma-Chlordane	PEST							1.33	UD	1.33				1.4	UD	1.4
Heptachlor	PEST							1.33	UD	1.33				1.4	UD	1.4
Heptachlor epoxide	PEST							1.33	UD	1.33				1.4	UD	1.4
Methoxychlor	PEST							1.33	UD	1.33				1.4	UD	1.4
Toxaphene	PEST							20	UJD	20				21	UJD	21

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-6 re-sample 1, J1FKK6			DZ-7 - J19YD7			DZ-7 re-sample 1, J1FKK7			DZ-7 re-sample 2, J1HH84			DZ-8 - J19YD8		
		3/16/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	14.2	UD	14.2	11	U	11	11	U	11	37.1		3.54
Acenaphthylene	PAH	9.3	U	9.3	41.7	JD	14.2	9.7	U	9.7	10	U	10	3.54	U	3.54
Anthracene	PAH	3.1	U	3.1	16.1	JD	14.2	3.3	U	3.3	3.4	U	3.4	2.84	J	3.54
Benzo(a)anthracene	PAH	3.3	U	3.3	592	JD	14.2	23		3.4	3.6	U	3.6	22.3		3.54
Benzo(a)pyrene	PAH	6.6	U	6.6	533	JD	14.2	23		6.9	11	J	7.2	22.5		3.54
Benzo(b)fluoranthene	PAH	4.3	U	4.3	974	JD	14.2	19		4.5	8.2	J	4.7	32.4		3.54
Benzo(ghi)perylene	PAH	7.4	U	7.4	488	JD	14.2	7.7	U	7.7	8.1	U	8.1	19.5		3.54
Benzo(k)fluoranthene	PAH	4.1	U	4.1	350	JD	14.2	9.0	J	4.2	5.8	J	4.4	11.5		3.54
Chrysene	PAH	5.0	U	5.0	602	JD	14.2	21	J	5.2	8.6	J	5.4	27.7		3.54
Dibenz[a,h]anthracene	PAH	11	U	11	86.3	JD	14.2	12	U	12	12	U	12	3.72		3.54
Fluoranthene	PAH	13	U	13	1140	JD	14.2	14	U	14	15	U	15	47.3		3.54
Fluorene	PAH	5.4	U	5.4	14.2	UD	14.2	5.7	U	5.7	5.9	U	5.9	2.13	J	3.54
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	460	JD	14.2	18	J	13	13	U	13	18.1		3.54
Naphthalene	PAH	12	U	12	14.2	UD	14.2	13	U	13	13	U	13	3.54	U	3.54
Phenanthrene	PAH	12	U	12	79.1	JD	14.2	24	J	13	13	U	13	12.8		3.54
Pyrene	PAH	12	U	12	1360	JD	14.2	47	X	13	15	J	13	48.8		3.54
Aroclor-1016	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1221	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1232	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1242	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1248	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1254	PCB				13.8	UJ	13.8							14	U	14
Aroclor-1260	PCB				6.28	J	13.8							14	U	14
Aldrin	PEST				1.38	UD	1.38							1.4	UD	1.4
Alpha-BHC	PEST				1.38	UD	1.38							1.4	UD	1.4
alpha-Chlordane	PEST				1.38	UD	1.38							1.4	UD	1.4
Beta-BHC	PEST				1.38	UD	1.38							1.4	UD	1.4
Delta-BHC	PEST				1.38	UD	1.38							1.4	UD	1.4
4,4'-DDD	PEST				1.38	UD	1.38							1.4	UD	1.4
4,4'-DDE	PEST				1.38	UD	1.38							1.4	UD	1.4
4,4'-DDT	PEST				1.38	UD	1.38							1.4	UD	1.4
Dieldrin	PEST				1.38	UD	1.38							1.4	UD	1.4
Endosulfan I	PEST				1.38	UD	1.38							1.4	UD	1.4
Endosulfan II	PEST				1.38	UD	1.38							1.4	UD	1.4
Endosulfan sulfate	PEST				1.38	UD	1.38							1.4	UD	1.4
Endrin	PEST				1.38	UD	1.38							1.4	UD	1.4
Endrin aldehyde	PEST				1.38	UD	1.38							1.4	UD	1.4
Endrin ketone	PEST				1.38	UD	1.38							1.4	UD	1.4
Gamma-BHC (Lindane)	PEST				1.38	UD	1.38							1.4	UD	1.4
gamma-Chlordane	PEST				1.38	UD	1.38							1.4	UD	1.4
Heptachlor	PEST				1.38	UD	1.38							1.4	UD	1.4
Heptachlor epoxide	PEST				1.38	UD	1.38							1.4	UD	1.4
Methoxychlor	PEST				1.38	UD	1.38							1.4	UD	1.4
Toxaphene	PEST				20.7	UJD	20.7							21.1	UJD	21.1

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-8 re-sample 1, J1FKK8			DZ-8 re-sample 2, J1HH85			DZ-9 - J19YD9			DZ-9 re-sample 1, J1FKK9			DZ-10 - J19YF0		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	9.9	U	9.9	3.48	U	3.48	10	U	10	3.49	U	3.49
Acenaphthylene	PAH	9.4	U	9.4	8.9	U	8.9	3.48	U	3.48	9.0	U	9.0	3.49	U	3.49
Anthracene	PAH	3.2	U	3.2	3.0	U	3.0	3.83		3.48	3.0	U	3.0	1.75	J	3.49
Benzo(a)anthracene	PAH	3.3	U	3.3	3.2	U	3.2	16.7		3.48	3.2	U	3.2	14.1		3.49
Benzo(a)pyrene	PAH	6.7	U	6.7	6.4	U	6.4	14.3		3.48	6.4	U	6.4	14.3		3.49
Benzo(b)fluoranthene	PAH	4.4	U	4.4	4.2	U	4.2	19		3.48	4.2	U	4.2	19.6		3.49
Benzo(ghi)perylene	PAH	7.5	U	7.5	7.1	U	7.1	10.1		3.48	7.2	U	7.2	10.1		3.49
Benzo(k)fluoranthene	PAH	4.1	U	4.1	3.9	U	3.9	7.49		3.48	3.9	U	3.9	6.99		3.49
Chrysene	PAH	5.1	U	5.1	4.8	U	4.8	18.5		3.48	4.8	U	4.8	15.2		3.49
Dibenz[a,h]anthracene	PAH	12	U	12	11	U	11	2.26	J	3.48	11	U	11	2.27	J	3.49
Fluoranthene	PAH	14	U	14	13	U	13	6.09		3.48	13	U	13	39.8		3.49
Fluorene	PAH	5.5	U	5.5	5.2	U	5.2	1.57	J	3.48	5.3	U	5.3	1.22	J	3.49
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	12	U	12	10.8		3.48	12	U	12	11		3.49
Naphthalene	PAH	13	U	13	12	U	12	3.48	U	3.48	12	U	12	3.49	U	3.49
Phenanthrene	PAH	13	U	13	12	U	12	14.1		3.48	12	U	12	1.75	J	3.49
Pyrene	PAH	13	U	13	12	U	12	42.8		3.48	12	U	12	36.2		3.49
Aroclor-1016	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1221	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1232	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1242	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1248	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1254	PCB							13.4	U	13.4				13.8	UJ	13.8
Aroclor-1260	PCB							13.4	U	13.4				13.8	UJ	13.8
Aldrin	PEST							1.34	UD	1.34				1.39	UD	1.39
Alpha-BHC	PEST							1.34	UD	1.34				1.39	UD	1.39
alpha-Chlordane	PEST							1.34	UD	1.34				1.39	UD	1.39
Beta-BHC	PEST							1.34	UD	1.34				1.39	UD	1.39
Delta-BHC	PEST							1.34	UD	1.34				1.39	UD	1.39
4,4'-DDD	PEST							1.34	UD	1.34				1.39	UD	1.39
4,4'-DDE	PEST							1.34	UD	1.34				1.39	UD	1.39
4,4'-DDT	PEST							1.34	UD	1.34				1.39	UD	1.39
Dieldrin	PEST							1.34	UD	1.34				1.39	UD	1.39
Endosulfan I	PEST							1.34	UD	1.34				1.39	UD	1.39
Endosulfan II	PEST							1.34	UD	1.34				1.39	UD	1.39
Endosulfan sulfate	PEST							1.34	UD	1.34				1.39	UD	1.39
Endrin	PEST							1.34	UD	1.34				1.39	UD	1.39
Endrin aldehyde	PEST							1.34	UD	1.34				1.39	UD	1.39
Endrin ketone	PEST							1.34	UD	1.34				1.39	UD	1.39
Gamma-BHC (Lindane)	PEST							1.34	UD	1.34				1.39	UD	1.39
gamma-Chlordane	PEST							1.34	UD	1.34				1.39	UD	1.39
Heptachlor	PEST							1.34	UD	1.34				1.39	UD	1.39
Heptachlor epoxide	PEST							1.34	UD	1.34				1.39	UD	1.39
Methoxychlor	PEST							1.34	UD	1.34				1.39	UD	1.39
Toxaphene	PEST							20.1	UJD	20.1				20.8	UJD	20.8

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-10 re-sample 1, J1FKL0			DZ-11 - J19YF1			DZ-11 re-sample 1, J1FKL1			DZ-12 - J19YF2			DZ-12 re-sample 1, J1FKL2		
		3/16/11			5/18/10			3/16/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	7.77		3.38	11	U	11	3.4	U	3.4	10	U	10
Acenaphthylene	PAH	9.1	U	9.1	3.38	U	3.38	9.8	U	9.8	3.4	U	3.4	9.1	U	9.1
Anthracene	PAH	3.1	U	3.1	9.29		3.38	3.3	U	3.3	15.2		3.4	3.1	U	3.1
Benzo(a)anthracene	PAH	3.2	U	3.2	48.7		3.38	3.5	U	3.5	94		3.4	3.2	U	3.2
Benzo(a)pyrene	PAH	6.4	U	6.4	68.9		3.38	7.0	U	7.0	142		3.4	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.2	U	4.2	69.1		3.38	4.6	U	4.6	107		3.4	4.2	U	4.2
Benzo(ghi)perylene	PAH	7.2	U	7.2	3.38	U	3.38	7.8	U	7.8	3.4	U	3.4	7.3	U	7.3
Benzo(k)fluoranthene	PAH	4.0	U	4.0	27.4		3.38	4.3	U	4.3	57.2		3.4	4.0	U	4.0
Chrysene	PAH	4.9	U	4.9	32.6		3.38	5.3	U	5.3	51.1		3.4	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	3.38	U	3.38	12	U	12	3.4	U	3.4	11	U	11
Fluoranthene	PAH	13	U	13	112		3.38	14	U	14	177		3.4	13	U	13
Fluorene	PAH	5.3	U	5.3	5.41		3.38	5.7	U	5.7	8.01		3.4	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	3.38	U	3.38	13	U	13	3.4	U	3.4	12	U	12
Naphthalene	PAH	12	U	12	3.38	U	3.38	13	U	13	3.4	U	3.4	12	U	12
Phenanthrene	PAH	12	U	12	40.7		3.38	13	U	13	55.9		3.4	12	U	12
Pyrene	PAH	12	U	12	125		3.38	13	U	13	155		3.4	12	U	12
Aroclor-1016	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1221	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1232	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1242	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1248	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1254	PCB				14.1	U	14.1				13.7	U	13.7			
Aroclor-1260	PCB				14.1	U	14.1				13.7	U	13.7			
Aldrin	PEST				1.41	UD	1.41				1.37	UD	1.37			
Alpha-BHC	PEST				1.41	UD	1.41				1.37	UD	1.37			
alpha-Chlordane	PEST				1.41	UD	1.41				1.37	UD	1.37			
Beta-BHC	PEST				1.41	UD	1.41				1.37	UD	1.37			
Delta-BHC	PEST				1.41	UD	1.41				1.37	UD	1.37			
4,4'-DDD	PEST				1.41	UD	1.41				1.37	UD	1.37			
4,4'-DDE	PEST				1.41	UD	1.41				1.37	UD	1.37			
4,4'-DDT	PEST				1.41	UD	1.41				1.37	UD	1.37			
Dieldrin	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endosulfan I	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endosulfan II	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endosulfan sulfate	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endrin	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endrin aldehyde	PEST				1.41	UD	1.41				1.37	UD	1.37			
Endrin ketone	PEST				1.41	UD	1.41				1.37	UD	1.37			
Gamma-BHC (Lindane)	PEST				1.41	UD	1.41				1.37	UD	1.37			
gamma-Chlordane	PEST				1.41	UD	1.41				1.37	UD	1.37			
Heptachlor	PEST				1.41	UD	1.41				1.37	UD	1.37			
Heptachlor epoxide	PEST				1.41	UD	1.41				1.37	UD	1.37			
Methoxychlor	PEST				1.41	UD	1.41				1.37	UD	1.37			
Toxaphene	PEST				21.2	UD	21.2				20.6	UD	20.6			

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J19YD1 - J19YF3 5/18/10			Duplicate of J1FKK8, J1FKL3 3/16/11			Duplicate of J1HH85 re-sample 2, J1HH86 4/13/11			Equipment Blank - J19YK0 5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.33	U	3.33	11	U	11	10	U	10			
Acenaphthylene	PAH	3.33	U	3.33	9.6	U	9.6	9.2	U	9.2			
Anthracene	PAH	1.33	J	3.33	3.3	U	3.3	3.1	U	3.1			
Benzo(a)anthracene	PAH	18.3		3.33	3.4	U	3.4	3.2	U	3.2			
Benzo(a)pyrene	PAH	15.2		3.33	6.9	U	6.9	6.5	U	6.5			
Benzo(b)fluoranthene	PAH	12.2		3.33	4.5	U	4.5	4.3	U	4.3			
Benzo(ghi)perylene	PAH	8.33		3.33	7.7	U	7.7	7.3	U	7.3			
Benzo(k)fluoranthene	PAH	6		3.33	4.2	U	4.2	4.0	U	4.0			
Chrysene	PAH	26.3		3.33	5.2	U	5.2	4.9	U	4.9			
Dibenz[a,h]anthracene	PAH	1.17	J	3.33	12	U	12	11	U	11			
Fluoranthene	PAH	40.5		3.33	14	U	14	13	U	13			
Fluorene	PAH	1.17	J	3.33	5.7	U	5.7	5.4	U	5.4			
Indeno(1,2,3-cd)pyrene	PAH	9.33		3.33	13	U	13	12	U	12			
Naphthalene	PAH	3.33	U	3.33	13	U	13	12	U	12			
Phenanthrene	PAH	14.7		3.33	13	U	13	12	U	12			
Pyrene	PAH	36		3.33	13	U	13	12	U	12			
Aroclor-1016	PCB	13.8	U	13.8									
Aroclor-1221	PCB	13.8	U	13.8									
Aroclor-1232	PCB	13.8	U	13.8									
Aroclor-1242	PCB	13.8	U	13.8									
Aroclor-1248	PCB	13.8	U	13.8									
Aroclor-1254	PCB	13.8	U	13.8									
Aroclor-1260	PCB	13.8	U	13.8									
Aldrin	PEST	1.39	UD	1.39									
Alpha-BHC	PEST	1.39	UD	1.39									
alpha-Chlordane	PEST	1.39	UD	1.39									
Beta-BHC	PEST	1.39	UD	1.39									
Delta-BHC	PEST	1.39	UD	1.39									
4,4'-DDD	PEST	1.39	UD	1.39									
4,4'-DDE	PEST	1.39	UD	1.39									
4,4'-DDT	PEST	1.39	UD	1.39									
Dieldrin	PEST	1.39	UD	1.39									
Endosulfan I	PEST	1.39	UD	1.39									
Endosulfan II	PEST	1.39	UD	1.39									
Endosulfan sulfate	PEST	1.39	UD	1.39									
Endrin	PEST	1.39	UD	1.39									
Endrin aldehyde	PEST	1.39	UD	1.39									
Endrin ketone	PEST	1.39	UD	1.39									
Gamma-BHC (Lindane)	PEST	1.39	UD	1.39									
gamma-Chlordane	PEST	1.39	UD	1.39									
Heptachlor	PEST	1.39	UD	1.39									
Heptachlor epoxide	PEST	1.39	UD	1.39									
Methoxychlor	PEST	1.39	UD	1.39									
Toxaphene	PEST	20.8	UD	20.8									

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-2 - J19YB9			Duplicate of J19YB9 - J19YD0			SZ-1 - J19YB8			SZ-3 - J19YC0			SZ-4 - J19YC1		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
1,2-Dichlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
1,3-Dichlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
1,4-Dichlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,4,5-Trichlorophenol	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
2,4,6-Trichlorophenol	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
2,4-Dichlorophenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,4-Dimethylphenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,4-Dinitrophenol	SVOA	1900	UJ	1900	1700	U	1700	1730	UJ	1730	1640	UJ	1640	1720	UJ	1720
2,4-Dinitrotoluene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2,6-Dinitrotoluene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Chloronaphthalene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Chlorophenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Methylnaphthalene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Methylphenol (cresol, o-)	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
2-Nitroaniline	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
2-Nitrophenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
3,3'-Dichlorobenzidine	SVOA	760	U	760	679	U	679	694	U	694	658	U	658	688	U	688
3+4 Methylphenol (cresol, m+p)	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
3-Nitroaniline	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
4,6-Dinitro-2-methylphenol	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
4-Bromophenylphenyl ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Chloro-3-methylphenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Chloroaniline	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Chlorophenylphenyl ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
4-Nitroaniline	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
4-Nitrophenol	SVOA	1900	U	1900	1700	U	1700	1730	U	1730	1640	U	1640	1720	U	1720
Acenaphthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Acenaphthylene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Anthracene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(a)anthracene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(a)pyrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(b)fluoranthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(ghi)perylene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Benzo(k)fluoranthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-chloro-1-methylethyl)ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-Chloroethoxy)methane	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-chloroethyl) ether	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Bis(2-ethylhexyl) phthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Butylbenzylphthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Carbazole	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Chrysene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Dibenz[a,h]anthracene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Dibenzofuran	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Diethyl phthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Dimethyl phthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Di-n-butylphthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Di-n-octylphthalate	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Fluoranthene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Fluorene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Hexachlorobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Hexachlorobutadiene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Hexachlorocyclopentadiene	SVOA	380	UJ	380	340	U	340	347	UJ	347	329	UJ	329	344	UJ	344
Hexachloroethane	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Indeno(1,2,3-cd)pyrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Isophorone	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Naphthalene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Nitrobenzene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
N-Nitroso-di-n-dipropylamine	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
N-Nitrosodiphenylamine	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Pentachlorophenol	SVOA	1900	UJ	1900	1700	U	1700	1730	UJ	1730	1640	UJ	1640	1720	UJ	1720
Phenanthrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Phenol	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344
Pyrene	SVOA	380	U	380	340	U	340	347	U	347	329	U	329	344	U	344

Attachment	1	Sheet No.	44 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-5 - J19YC2			SZ-6 - J19YC3			SZ-7 - J19YC4			SZ-8 - J19YC5			SZ-9 - J19YC6		
		5/18/10			5/18/10			5/18/10			5/18/10			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
1,2-Dichlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
1,3-Dichlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
1,4-Dichlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,4,5-Trichlorophenol	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
2,4,6-Trichlorophenol	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
2,4-Dichlorophenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,4-Dimethylphenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,4-Dinitrophenol	SVOA	1750	UJ	1750	1710	UJ	1710	1730	UJ	1730	1680	UJ	1680	3430	U	3430
2,4-Dinitrotoluene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2,6-Dinitrotoluene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Chloronaphthalene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Chlorophenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Methylnaphthalene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Methylphenol (cresol, o-)	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
2-Nitroaniline	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
2-Nitrophenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
3,3'-Dichlorobenzidine	SVOA	699	U	699	682	U	682	691	U	691	671	U	671	1370	U	1370
3+4 Methylphenol (cresol, m+p)	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
3-Nitroaniline	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
4,6-Dinitro-2-methylphenol	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
4-Bromophenylphenyl ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Chloro-3-methylphenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Chloroaniline	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Chlorophenylphenyl ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
4-Nitroaniline	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
4-Nitrophenol	SVOA	1750	U	1750	1710	U	1710	1730	U	1730	1680	U	1680	3430	U	3430
Acenaphthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Acenaphthylene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Anthracene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(a)anthracene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(a)pyrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(b)fluoranthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(ghi)perylene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Benzo(k)fluoranthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-chloro-1-methylethyl)ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-Chloroethoxy)methane	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-chloroethyl) ether	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Bis(2-ethylhexyl) phthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Butylbenzylphthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Carbazole	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Chrysene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Dibenz[a,h]anthracene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Dibenzofuran	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Diethyl phthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Dimethyl phthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Di-n-butylphthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Di-n-octylphthalate	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Fluoranthene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Fluorene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Hexachlorobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Hexachlorobutadiene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Hexachlorocyclopentadiene	SVOA	349	UJ	349	341	UJ	341	345	UJ	345	335	UJ	335	686	U	686
Hexachloroethane	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Indeno(1,2,3-cd)pyrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Isophorone	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Naphthalene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Nitrobenzene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
N-Nitroso-di-n-dipropylamine	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
N-Nitrosodiphenylamine	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Pentachlorophenol	SVOA	1750	UJ	1750	1710	UJ	1710	1730	UJ	1730	1680	UJ	1680	3430	U	3430
Phenanthrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Phenol	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686
Pyrene	SVOA	349	U	349	341	U	341	345	U	345	335	U	335	686	U	686

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SZ-9 re-sample 1, J1FKL4			SZ-10 - J19YC7			SZ-11 - J19YC8			SZ-11 re-sample 1, J1FKL5			SZ-12 - J19YC9		
		3/16/11			5/18/10			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	337	UJ	337	342	U	342	28	U	28	340	U	340
1,2-Dichlorobenzene	SVOA	23	U	23	337	U	337	342	U	342	22	U	22	340	U	340
1,3-Dichlorobenzene	SVOA	13	U	13	337	U	337	342	U	342	12	U	12	340	U	340
1,4-Dichlorobenzene	SVOA	14	U	14	337	U	337	342	U	342	14	U	14	340	U	340
2,4,5-Trichlorophenol	SVOA	11	U	11	337	UJ	337	342	U	342	10	U	10	340	U	340
2,4,6-Trichlorophenol	SVOA	11	U	11	337	UJ	337	342	U	342	10	U	10	340	U	340
2,4-Dichlorophenol	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
2,4-Dimethylphenol	SVOA	70	U	70	337	U	337	342	U	342	67	U	67	340	U	340
2,4-Dinitrophenol	SVOA	350	U	350	1690	UJ	1690	1710	U	1710	340	U	340	1700	U	1700
2,4-Dinitrotoluene	SVOA	70	U	70	337	U	337	342	U	342	67	U	67	340	U	340
2,6-Dinitrotoluene	SVOA	30	U	30	337	U	337	342	U	342	28	U	28	340	U	340
2-Chloronaphthalene	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
2-Chlorophenol	SVOA	22	U	22	337	U	337	342	U	342	21	U	21	340	U	340
2-Methylnaphthalene	SVOA	20	U	20	337	U	337	342	U	342	19	U	19	340	U	340
2-Methylphenol (cresol, o-)	SVOA	14	U	14	337	U	337	342	U	342	13	U	13	340	U	340
2-Nitroaniline	SVOA	53	U	53	1690	U	1690	1710	U	1710	50	U	50	1700	U	1700
2-Nitrophenol	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
3,3'-Dichlorobenzidine	SVOA	96	U	96	674	U	674	684	U	684	91	U	91	680	U	680
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	337	U	337	342	U	342	33	U	33	340	U	340
3-Nitroaniline	SVOA	78	U	78	1690	U	1690	1710	U	1710	74	U	74	1700	U	1700
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	337	UJ	337	342	U	342	330	U	330	340	U	340
4-Bromophenylphenyl ether	SVOA	20	U	20	337	U	337	342	U	342	19	U	19	340	U	340
4-Chloro-3-methylphenol	SVOA	70	U	70	337	U	337	342	U	342	67	U	67	340	U	340
4-Chloroaniline	SVOA	87	U	87	337	U	337	342	U	342	83	U	83	340	U	340
4-Chlorophenylphenyl ether	SVOA	22	U	22	337	U	337	342	U	342	21	U	21	340	U	340
4-Nitroaniline	SVOA	77	U	77	1690	U	1690	1710	U	1710	73	U	73	1700	U	1700
4-Nitrophenol	SVOA	100	U	100	1690	U	1690	1710	U	1710	98	U	98	1700	U	1700
Acenaphthene	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
Acenaphthylene	SVOA	18	U	18	337	U	337	342	U	342	17	U	17	340	U	340
Anthracene	SVOA	18	U	18	337	U	337	89	J	342	17	U	17	340	U	340
Benzo(a)anthracene	SVOA	21	U	21	337	U	337	605		342	20	U	20	340	U	340
Benzo(a)pyrene	SVOA	21	U	21	337	U	337	541		342	20	U	20	340	U	340
Benzo(b)fluoranthene	SVOA	28	U	28	337	U	337	523		342	26	U	26	340	U	340
Benzo(ghi)perylene	SVOA	17	U	17	337	U	337	350		342	16	U	16	340	U	340
Benzo(k)fluoranthene	SVOA	43	U	43	337	U	337	498		342	40	U	40	340	U	340
Bis(2-chloro-1-methylethyl)ether	SVOA	25	U	25	337	U	337	342	U	342	23	U	23	340	U	340
Bis(2-Chloroethoxy)methane	SVOA	25	U	25	337	U	337	342	U	342	23	U	23	340	U	340
Bis(2-chloroethyl) ether	SVOA	18	U	18	337	U	337	342	U	342	17	U	17	340	U	340
Bis(2-ethylhexyl) phthalate	SVOA	49	U	49	337	U	337	342	U	342	46	U	46	340	U	340
Butylbenzylphthalate	SVOA	46	U	46	337	U	337	342	U	342	43	U	43	340	U	340
Carbazole	SVOA	38	U	38	337	U	337	342	U	342	36	U	36	340	U	340
Chrysene	SVOA	29	U	29	337	U	337	609		342	27	U	27	340	U	340
Dibenz[a,h]anthracene	SVOA	20	U	20	337	U	337	127	J	342	19	U	19	340	U	340
Dibenzofuran	SVOA	21	U	21	337	U	337	342	U	342	20	U	20	340	U	340
Diethyl phthalate	SVOA	28	U	28	337	U	337	342	U	342	26	U	26	340	U	340
Dimethyl phthalate	SVOA	25	U	25	337	U	337	342	U	342	23	U	23	340	U	340
Di-n-butylphthalate	SVOA	31	U	31	337	U	337	342	U	342	29	U	29	340	U	340
Di-n-octylphthalate	SVOA	15	U	15	337	U	337	342	U	342	15	U	15	340	U	340
Fluoranthene	SVOA	38	U	38	337	U	337	1050		1050	36	U	36	340	U	340
Fluorene	SVOA	19	U	19	337	U	337	342	U	342	18	U	18	340	U	340
Hexachlorobenzene	SVOA	31	U	31	337	U	337	342	U	342	29	U	29	340	U	340
Hexachlorobutadiene	SVOA	11	U	11	337	U	337	342	U	342	10	U	10	340	U	340
Hexachlorocyclopentadiene	SVOA	53	U	53	337	UJ	337	342	U	342	50	U	50	340	U	340
Hexachloroethane	SVOA	23	U	23	337	U	337	342	U	342	22	U	22	340	U	340
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	337	U	337	347		342	22	U	22	340	U	340
Isophorone	SVOA	18	U	18	337	U	337	342	U	342	17	U	17	340	U	340
Naphthalene	SVOA	33	U	33	337	U	337	342	U	342	31	U	31	340	U	340
Nitrobenzene	SVOA	23	U	23	337	U	337	342	U	342	22	U	22	340	U	340
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	337	U	337	342	U	342	31	U	31	340	U	340
N-Nitrosodiphenylamine	SVOA	22	U	22	337	U	337	342	U	342	21	U	21	340	U	340
Pentachlorophenol	SVOA	350	U	350	1690	UJ	1690	1710	U	1710	330	U	330	1700	U	1700
Phenanthrene	SVOA	18	U	18	337	U	337	318	J	342	17	U	17	340	U	340
Phenol	SVOA	19	U	19	337	U	337	342	U	342	18	U	18	340	U	340
Pyrene	SVOA	22	J	13	337	U	337	921		342	12	U	12	340	U	340

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-1 - J19YD1			DZ-1 re-sample 1, J1FKK1			DZ-1 re-sample 2, J1HH80			DZ-2 - J19YD2			DZ-2 re-sample 1, J1FKK2		
		5/18/10			3/16/11			4/13/11			5/18/10			3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	333	UJ	333	30	U	30	29	U	29	347	UJ	347	30	U	30
1,2-Dichlorobenzene	SVOA	333	U	333	24	U	24	23	U	23	347	U	347	23	U	23
1,3-Dichlorobenzene	SVOA	333	U	333	13	U	13	12	U	12	347	U	347	13	U	13
1,4-Dichlorobenzene	SVOA	333	U	333	15	U	15	14	U	14	347	U	347	14	U	14
2,4,5-Trichlorophenol	SVOA	333	UJ	333	11	U	11	10	U	10	347	UJ	347	11	U	11
2,4,6-Trichlorophenol	SVOA	333	UJ	333	11	U	11	10	U	10	347	UJ	347	11	U	11
2,4-Dichlorophenol	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
2,4-Dimethylphenol	SVOA	333	U	333	71	U	71	69	U	69	347	U	347	70	U	70
2,4-Dinitrophenol	SVOA	1660	UJ	1660	360	U	360	350	U	350	1730	UJ	1730	350	U	350
2,4-Dinitrotoluene	SVOA	333	U	333	71	U	71	69	U	69	347	U	347	70	U	70
2,6-Dinitrotoluene	SVOA	333	U	333	30	U	30	29	U	29	347	U	347	30	U	30
2-Chloronaphthalene	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
2-Chlorophenol	SVOA	333	U	333	22	U	22	22	U	22	347	U	347	22	U	22
2-Methylnaphthalene	SVOA	333	U	333	20	U	20	20	U	20	347	U	347	20	U	20
2-Methylphenol (cresol, o-)	SVOA	333	U	333	14	U	14	14	U	14	347	U	347	14	U	14
2-Nitroaniline	SVOA	1660	U	1660	53	U	53	52	U	52	1730	U	1730	53	U	53
2-Nitrophenol	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
3,3'-Dichlorobenzidine	SVOA	665	U	665	96	U	96	94	U	94	693	U	693	95	U	95
3+4 Methylphenol (cresol, m+p)	SVOA	333	U	333	35	U	35	34	U	34	347	U	347	35	U	35
3-Nitroaniline	SVOA	1660	U	1660	78	U	78	76	U	76	1730	U	1730	77	U	77
4,6-Dinitro-2-methylphenol	SVOA	333	UJ	333	350	U	350	340	U	340	347	UJ	347	350	U	350
4-Bromophenylphenyl ether	SVOA	333	U	333	20	U	20	20	U	20	347	U	347	20	U	20
4-Chloro-3-methylphenol	SVOA	333	U	333	71	U	71	69	U	69	347	U	347	70	U	70
4-Chloroaniline	SVOA	333	U	333	87	U	87	85	U	85	347	U	347	87	U	87
4-Chlorophenylphenyl ether	SVOA	333	U	333	22	U	22	22	U	22	347	U	347	22	U	22
4-Nitroaniline	SVOA	1660	U	1660	77	U	77	75	U	75	1730	U	1730	77	U	77
4-Nitrophenol	SVOA	1660	U	1660	100	U	100	100	U	100	1730	U	1730	100	U	100
Acenaphthene	SVOA	333	U	333	11	U	11	11	U	11	347	U	347	11	U	11
Acenaphthylene	SVOA	333	U	333	18	U	18	18	U	18	347	U	347	18	U	18
Anthracene	SVOA	333	U	333	18	U	18	18	U	18	347	U	347	18	U	18
Benzo(a)anthracene	SVOA	333	U	333	26	J	21	36	J	21	347	U	347	29	J	21
Benzo(a)pyrene	SVOA	333	U	333	21	U	21	33	J	21	347	U	347	23	J	21
Benzo(b)fluoranthene	SVOA	333	U	333	43	JX	28	67	JK	27	347	U	347	47	JX	28
Benzo(ghi)perylene	SVOA	333	U	333	17	U	17	26	J	17	347	U	347	17	U	17
Benzo(k)fluoranthene	SVOA	333	U	333	43	UX	43	42	UK	42	347	U	347	42	UX	42
Bis(2-chloro-1-methylethyl)ether	SVOA	333	U	333	25	U	25	24	U	24	347	U	347	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	333	U	333	25	U	25	24	U	24	347	U	347	24	U	24
Bis(2-chloroethyl) ether	SVOA	333	U	333	18	U	18	17	U	17	347	U	347	18	U	18
Bis(2-ethylhexyl) phthalate	SVOA	333	U	333	49	U	49	94	JB	48	347	U	347	49	U	49
Butylbenzylphthalate	SVOA	333	U	333	46	U	46	45	U	45	347	U	347	46	U	46
Carbazole	SVOA	333	U	333	38	U	38	37	U	37	347	U	347	38	U	38
Chrysene	SVOA	333	U	333	29	U	29	39	J	28	347	U	347	29	J	29
Dibenz[a,h]anthracene	SVOA	333	U	333	20	U	20	20	U	20	347	U	347	20	U	20
Dibenzofuran	SVOA	333	U	333	21	U	21	21	U	21	347	U	347	21	U	21
Diethyl phthalate	SVOA	333	U	333	28	U	28	27	U	27	347	U	347	28	U	28
Dimethyl phthalate	SVOA	333	U	333	25	U	25	24	U	24	347	U	347	24	U	24
Di-n-butylphthalate	SVOA	333	U	333	31	U	31	30	U	30	347	U	347	31	U	31
Di-n-octylphthalate	SVOA	333	U	333	15	U	15	15	U	15	347	U	347	15	U	15
Fluoranthene	SVOA	333	U	333	45	J	38	59	J	37	347	U	347	40	J	38
Fluorene	SVOA	333	U	333	19	U	19	19	U	19	347	U	347	19	U	19
Hexachlorobenzene	SVOA	333	U	333	31	U	31	30	U	30	347	U	347	31	U	31
Hexachlorobutadiene	SVOA	333	U	333	11	U	11	10	U	10	347	U	347	11	U	11
Hexachlorocyclopentadiene	SVOA	333	UJ	333	53	U	53	52	U	52	347	UJ	347	53	U	53
Hexachloroethane	SVOA	333	U	333	23	U	23	22	U	22	347	U	347	23	U	23
Indeno(1,2,3-cd)pyrene	SVOA	333	U	333	24	U	24	23	U	23	347	U	347	23	U	23
Isophorone	SVOA	333	U	333	18	U	18	18	U	18	347	U	347	18	U	18
Naphthalene	SVOA	333	U	333	33	U	33	32	U	32	347	U	347	33	U	33
Nitrobenzene	SVOA	333	U	333	24	U	24	23	U	23	347	U	347	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	333	U	333	33	U	33	32	U	32	347	U	347	33	U	33
N-Nitrosodiphenylamine	SVOA	333	U	333	22	U	22	22	U	22	347	U	347	22	U	22
Pentachlorophenol	SVOA	1660	UJ	1660	350	U	350	340	U	340	1730	UJ	1730	350	U	350
Phenanthrene	SVOA	333	U	333	23	J	18	25	J	18	347	U	347	18	U	18
Phenol	SVOA	333	U	333	19	U	19	19	U	19	347	U	347	19	U	19
Pyrene	SVOA	333	U	333	43	J	13	57	J	13	347	U	347	43	J	13

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CONSTITUENT	CLASS	DZ-2 re-sample 2, J1HH81			DZ-3 - J19YD3			DZ-3 re-sample 1, J1FKK3			DZ-3 re-sample 2, J1HH82			DZ-4 - J19YD4		
		4/13/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	346	UJ	346	34	U	34	27	U	27	346	UJ	346
1,2-Dichlorobenzene	SVOA	22	U	22	346	U	346	26	U	26	22	U	22	346	U	346
1,3-Dichlorobenzene	SVOA	12	U	12	346	U	346	14	U	14	12	U	12	346	U	346
1,4-Dichlorobenzene	SVOA	14	U	14	346	U	346	16	U	16	13	U	13	346	U	346
2,4,5-Trichlorophenol	SVOA	10	U	10	346	UJ	346	12	U	12	9.8	U	9.8	346	UJ	346
2,4,6-Trichlorophenol	SVOA	10	U	10	346	UJ	346	12	U	12	9.8	U	9.8	346	UJ	346
2,4-Dichlorophenol	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
2,4-Dimethylphenol	SVOA	67	U	67	346	U	346	79	U	79	65	U	65	346	U	346
2,4-Dinitrophenol	SVOA	340	U	340	1730	UJ	1730	400	U	400	330	U	330	1730	UJ	1730
2,4-Dinitrotoluene	SVOA	67	U	67	346	U	346	79	U	79	65	U	65	346	U	346
2,6-Dinitrotoluene	SVOA	29	U	29	346	U	346	34	U	34	27	U	27	346	U	346
2-Chloronaphthalene	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
2-Chlorophenol	SVOA	21	U	21	346	U	346	25	U	25	21	U	21	346	U	346
2-Methylnaphthalene	SVOA	19	U	19	346	U	346	23	U	23	19	U	19	346	U	346
2-Methylphenol (cresol, o-)	SVOA	13	U	13	346	U	346	16	U	16	13	U	13	346	U	346
2-Nitroaniline	SVOA	51	U	51	1730	U	1730	60	U	60	49	U	49	1730	U	1730
2-Nitrophenol	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
3,3'-Dichlorobenzidine	SVOA	92	U	92	691	U	691	110	U	110	88	U	88	693	U	693
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	346	U	346	40	U	40	32	U	32	346	U	346
3-Nitroaniline	SVOA	75	U	75	1730	U	1730	88	U	88	72	U	72	1730	U	1730
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	346	UJ	346	400	U	400	320	U	320	346	UJ	346
4-Bromophenylphenyl ether	SVOA	19	U	19	346	U	346	23	U	23	19	U	19	346	U	346
4-Chloro-3-methylphenol	SVOA	67	U	67	346	U	346	79	U	79	65	U	65	346	U	346
4-Chloroaniline	SVOA	84	U	84	346	U	346	98	U	98	80	U	80	346	U	346
4-Chlorophenylphenyl ether	SVOA	21	U	21	346	U	346	25	U	25	21	U	21	346	U	346
4-Nitroaniline	SVOA	74	U	74	1730	U	1730	87	U	87	71	U	71	1730	U	1730
4-Nitrophenol	SVOA	99	U	99	1730	U	1730	120	U	120	95	U	95	1730	U	1730
Acenaphthene	SVOA	11	U	11	346	U	346	12	U	12	10	U	10	346	U	346
Acenaphthylene	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Anthracene	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Benzo(a)anthracene	SVOA	20	U	20	346	U	346	24	U	24	20	U	20	346	U	346
Benzo(a)pyrene	SVOA	20	U	20	346	U	346	24	U	24	20	U	20	346	U	346
Benzo(b)fluoranthene	SVOA	27	U	27	346	U	346	31	U	31	26	U	26	346	U	346
Benzo(ghi)perylene	SVOA	16	U	16	346	U	346	19	U	19	16	U	16	346	U	346
Benzo(k)fluoranthene	SVOA	41	U	41	346	U	346	48	U	48	39	U	39	346	U	346
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	346	U	346	28	U	28	23	U	23	346	U	346
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	346	U	346	28	U	28	23	U	23	346	U	346
Bis(2-chloroethyl) ether	SVOA	17	U	17	346	U	346	20	U	20	16	U	16	346	U	346
Bis(2-ethylhexyl) phthalate	SVOA	80	JB	47	346	U	346	55	U	55	72	JB	45	346	U	346
Butylbenzylphthalate	SVOA	44	U	44	346	U	346	52	U	52	42	U	42	346	U	346
Carbazole	SVOA	37	U	37	346	U	346	43	U	43	35	U	35	346	U	346
Chrysene	SVOA	28	U	28	53.9	J	346	32	U	32	26	U	26	346	U	346
Dibenz[a,h]anthracene	SVOA	19	U	19	346	U	346	23	U	23	19	U	19	346	U	346
Dibenzofuran	SVOA	20	U	20	346	U	346	24	U	24	20	U	20	346	U	346
Diethyl phthalate	SVOA	27	U	27	346	U	346	31	U	31	25	U	25	346	U	346
Dimethyl phthalate	SVOA	24	U	24	346	U	346	28	U	28	23	U	23	346	U	346
Di-n-butylphthalate	SVOA	30	U	30	346	U	346	35	U	35	28	U	28	346	U	346
Di-n-octylphthalate	SVOA	15	U	15	346	U	346	17	U	17	14	U	14	346	U	346
Fluoranthene	SVOA	37	U	37	85.7	J	85.7	43	U	43	35	U	35	58.1	J	346
Fluorene	SVOA	18	U	18	346	U	346	22	U	22	18	U	18	346	U	346
Hexachlorobenzene	SVOA	30	U	30	346	U	346	35	U	35	28	U	28	346	U	346
Hexachlorobutadiene	SVOA	10	U	10	346	U	346	12	U	12	9.8	U	9.8	346	U	346
Hexachlorocyclopentadiene	SVOA	51	U	51	346	UJ	346	60	U	60	49	U	49	346	UJ	346
Hexachloroethane	SVOA	22	U	22	346	U	346	26	U	26	21	U	21	346	U	346
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	346	U	346	26	U	26	22	U	22	346	U	346
Isophorone	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Naphthalene	SVOA	32	U	32	346	U	346	37	U	37	30	U	30	346	U	346
Nitrobenzene	SVOA	22	U	22	346	U	346	26	U	26	22	U	22	346	U	346
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	346	U	346	37	U	37	30	U	30	346	U	346
N-Nitrosodiphenylamine	SVOA	21	U	21	346	U	346	25	U	25	21	U	21	346	U	346
Pentachlorophenol	SVOA	340	U	340	1730	UJ	1730	400	U	400	320	U	320	1730	UJ	1730
Phenanthrene	SVOA	17	U	17	346	U	346	20	U	20	17	U	17	346	U	346
Phenol	SVOA	18	U	18	346	U	346	25	J	22	18	U	18	346	U	346
Pyrene	SVOA	12	U	12	85.4	J	346	16	J	15	12	U	12	52.9	J	346

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CONSTITUENT	CLASS	DZ-4 re-sample 1, J1FKK4			DZ-4 re-sample 2, J1HH83			DZ-5 - J19YD5			DZ-5 re-sample 1, J1FKK5			DZ-6 - J19YD6		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	27	U	27	343	UJ	343	29	U	29	331	UJ	331
1,2-Dichlorobenzene	SVOA	23	U	23	22	U	22	343	U	343	23	U	23	331	U	331
1,3-Dichlorobenzene	SVOA	13	U	13	12	U	12	343	U	343	13	U	13	331	U	331
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	343	U	343	14	U	14	331	U	331
2,4,5-Trichlorophenol	SVOA	10	U	10	9.8	U	9.8	343	UJ	343	11	U	11	331	UJ	331
2,4,6-Trichlorophenol	SVOA	10	U	10	9.8	U	9.8	343	UJ	343	11	U	11	331	UJ	331
2,4-Dichlorophenol	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
2,4-Dimethylphenol	SVOA	69	U	69	65	U	65	343	U	343	69	U	69	331	U	331
2,4-Dinitrophenol	SVOA	350	U	350	330	U	330	1720	UJ	1720	350	U	350	1660	UJ	1660
2,4-Dinitrotoluene	SVOA	69	U	69	65	U	65	343	U	343	69	U	69	331	U	331
2,6-Dinitrotoluene	SVOA	29	U	29	27	U	27	343	U	343	29	U	29	331	U	331
2-Chloronaphthalene	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
2-Chlorophenol	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
2-Methylnaphthalene	SVOA	20	U	20	19	U	19	343	U	343	20	U	20	331	U	331
2-Methylphenol (cresol, o-)	SVOA	14	U	14	13	U	13	343	U	343	14	U	14	331	U	331
2-Nitroaniline	SVOA	52	U	52	49	U	49	1720	U	1720	53	U	53	1660	U	1660
2-Nitrophenol	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
3,3'-Dichlorobenzidine	SVOA	94	U	94	88	U	88	687	U	687	95	U	95	662	U	662
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	32	U	32	343	U	343	35	U	35	331	U	331
3-Nitroaniline	SVOA	76	U	76	71	U	71	1720	U	1720	77	U	77	1660	U	1660
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	320	U	320	343	UJ	343	350	U	350	331	UJ	331
4-Bromophenylphenyl ether	SVOA	20	U	20	19	U	19	343	U	343	20	U	20	331	U	331
4-Chloro-3-methylphenol	SVOA	69	U	69	65	U	65	343	U	343	69	U	69	331	U	331
4-Chloroaniline	SVOA	86	U	86	80	U	80	343	U	343	86	U	86	331	U	331
4-Chlorophenylphenyl ether	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
4-Nitroaniline	SVOA	76	U	76	71	U	71	1720	U	1720	76	U	76	1660	U	1660
4-Nitrophenol	SVOA	100	U	100	95	U	95	1720	U	1720	100	U	100	1660	U	1660
Acenaphthene	SVOA	11	U	11	10	U	10	343	U	343	11	U	11	331	U	331
Acenaphthylene	SVOA	18	U	18	17	U	17	343	U	343	18	U	18	331	U	331
Anthracene	SVOA	18	U	18	17	U	17	343	U	343	18	U	18	92.2	J	331
Benzo(a)anthracene	SVOA	21	U	21	69	J	20	343	U	343	21	U	21	212	J	331
Benzo(a)pyrene	SVOA	21	U	21	60	J	20	343	U	343	21	U	21	164	J	331
Benzo(b)fluoranthene	SVOA	27	U	27	150	JK	26	343	U	343	28	U	28	152	J	331
Benzo(ghi)perylene	SVOA	17	U	17	50	J	16	343	U	343	17	U	17	119	J	331
Benzo(k)fluoranthene	SVOA	42	U	42	39	UK	39	343	U	343	42	U	42	158	J	331
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	23	U	23	343	U	343	24	U	24	331	U	331
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	23	U	23	343	U	343	24	U	24	331	U	331
Bis(2-chloroethyl) ether	SVOA	17	U	17	16	U	16	343	U	343	17	U	17	331	U	331
Bis(2-ethylhexyl) phthalate	SVOA	48	U	48	89	JB	45	343	U	343	48	U	48	331	U	331
Butylbenzylphthalate	SVOA	45	U	45	42	U	42	343	U	343	45	U	45	331	U	331
Carbazole	SVOA	38	U	38	35	U	35	343	U	343	38	U	38	331	U	331
Chrysene	SVOA	28	U	28	67	J	26	343	U	343	28	U	28	219	J	331
Dibenz[a,h]anthracene	SVOA	20	U	20	19	U	19	343	U	343	20	U	20	331	U	331
Dibenzofuran	SVOA	21	U	21	20	U	20	343	U	343	21	U	21	331	U	331
Diethyl phthalate	SVOA	27	U	27	25	U	25	343	U	343	27	U	27	331	U	331
Dimethyl phthalate	SVOA	24	U	24	23	U	23	343	U	343	24	U	24	331	U	331
Di-n-butylphthalate	SVOA	30	U	30	28	U	28	343	U	343	30	U	30	331	U	331
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	343	U	343	15	U	15	331	U	331
Fluoranthene	SVOA	38	U	38	81	J	35	343	U	343	38	U	38	543		331
Fluorene	SVOA	19	U	19	18	U	18	343	U	343	19	U	19	331	U	331
Hexachlorobenzene	SVOA	30	U	30	28	U	28	343	U	343	30	U	30	331	U	331
Hexachlorobutadiene	SVOA	10	U	10	9.8	U	9.8	343	U	343	11	U	11	331	U	331
Hexachlorocyclopentadiene	SVOA	52	U	52	49	U	49	343	UJ	343	53	U	53	331	UJ	331
Hexachloroethane	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	42	J	22	343	U	343	23	U	23	102	J	331
Isophorone	SVOA	18	U	18	17	U	17	343	U	343	18	U	18	331	U	331
Naphthalene	SVOA	32	U	32	30	U	30	343	U	343	33	U	33	331	U	331
Nitrobenzene	SVOA	23	U	23	22	U	22	343	U	343	23	U	23	331	U	331
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	30	U	30	343	U	343	33	U	33	331	U	331
N-Nitrosodiphenylamine	SVOA	22	U	22	21	U	21	343	U	343	22	U	22	331	U	331
Pentachlorophenol	SVOA	350	U	350	320	U	320	1720	UJ	1720	350	U	350	1660	UJ	1660
Phenanthrene	SVOA	18	U	18	21	J	17	343	U	343	18	U	18	408		331
Phenol	SVOA	19	U	19	18	U	18	343	U	343	19	U	19	331	U	331
Pyrene	SVOA	13	U	13	84	J	12	343	U	343	13	U	13	335		331

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-6 re-sample 1, J1FKK6			DZ-7 - J19YD7			DZ-7 re-sample 1, J1FKK7			DZ-7 re-sample 2, J1HH84			DZ-8 - J19YD8		
		3/16/11			5/18/10			3/16/11			4/13/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	344	UJ	344	30	U	30	29	U	29	349	UJ	349
1,2-Dichlorobenzene	SVOA	22	U	22	344	U	344	23	U	23	23	U	23	349	U	349
1,3-Dichlorobenzene	SVOA	12	U	12	344	U	344	13	U	13	13	U	13	349	U	349
1,4-Dichlorobenzene	SVOA	14	U	14	344	U	344	14	U	14	14	U	14	349	U	349
2,4,5-Trichlorophenol	SVOA	10	U	10	344	UJ	344	11	U	11	11	U	11	349	UJ	349
2,4,6-Trichlorophenol	SVOA	10	U	10	344	UJ	344	11	U	11	11	U	11	349	UJ	349
2,4-Dichlorophenol	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
2,4-Dimethylphenol	SVOA	67	U	67	344	U	344	70	U	70	69	U	69	349	U	349
2,4-Dinitrophenol	SVOA	340	U	340	1720	UJ	1720	350	U	350	350	U	350	1740	UJ	1740
2,4-Dinitrotoluene	SVOA	67	U	67	344	U	344	70	U	70	69	U	69	349	U	349
2,6-Dinitrotoluene	SVOA	28	U	28	344	U	344	30	U	30	29	U	29	349	U	349
2-Chloronaphthalene	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
2-Chlorophenol	SVOA	21	U	21	344	U	344	22	U	22	22	U	22	349	U	349
2-Methylnaphthalene	SVOA	19	U	19	344	U	344	20	U	20	20	U	20	349	U	349
2-Methylphenol (cresol, o-)	SVOA	13	U	13	344	U	344	14	U	14	14	U	14	349	U	349
2-Nitroaniline	SVOA	51	U	51	1720	U	1720	53	U	53	53	U	53	1740	U	1740
2-Nitrophenol	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
3,3'-Dichlorobenzidine	SVOA	91	U	91	689	U	689	96	U	96	95	U	95	698	U	698
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	344	U	344	35	U	35	35	U	35	349	U	349
3-Nitroaniline	SVOA	74	U	74	1720	U	1720	77	U	77	77	U	77	1740	U	1740
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	344	UJ	344	350	U	350	350	U	350	349	UJ	349
4-Bromophenylphenyl ether	SVOA	19	U	19	344	U	344	20	U	20	20	U	20	349	U	349
4-Chloro-3-methylphenol	SVOA	67	U	67	344	U	344	70	U	70	69	U	69	349	U	349
4-Chloroaniline	SVOA	83	U	83	344	U	344	87	U	87	86	U	86	349	U	349
4-Chlorophenylphenyl ether	SVOA	21	U	21	344	U	344	22	U	22	22	U	22	349	U	349
4-Nitroaniline	SVOA	74	U	74	1720	U	1720	77	U	77	76	U	76	1740	U	1740
4-Nitrophenol	SVOA	99	U	99	1720	U	1720	100	U	100	100	U	100	1740	U	1740
Acenaphthene	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
Acenaphthylene	SVOA	17	U	17	344	U	344	18	U	18	18	U	18	349	U	349
Anthracene	SVOA	17	U	17	344	U	344	18	U	18	18	U	18	349	U	349
Benzo(a)anthracene	SVOA	20	U	20	682		344	30	J	21	21	U	21	349	U	349
Benzo(a)pyrene	SVOA	20	U	20	515		344	36	J	21	21	U	21	349	U	349
Benzo(b)fluoranthene	SVOA	27	U	27	666		344	51	JX	28	28	U	28	349	U	349
Benzo(ghi)perylene	SVOA	16	U	16	481		344	17	U	17	17	U	17	349	U	349
Benzo(k)fluoranthene	SVOA	41	U	41	566		344	42	UX	42	42	U	42	349	U	349
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	344	U	344	24	U	24	24	U	24	349	U	349
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	344	U	344	24	U	24	24	U	24	349	U	349
Bis(2-chloroethyl) ether	SVOA	17	U	17	344	U	344	18	U	18	17	U	17	349	U	349
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	344	U	344	49	U	49	78	JB	48	349	U	349
Butylbenzylphthalate	SVOA	44	U	44	344	U	344	46	U	46	45	U	45	349	U	349
Carbazole	SVOA	37	U	37	344	U	344	38	U	38	38	U	38	349	U	349
Chrysene	SVOA	27	U	27	724		344	35	J	29	28	U	28	349	U	349
Dibenz[a,h]anthracene	SVOA	19	U	19	134	J	344	20	U	20	20	U	20	349	U	349
Dibenzofuran	SVOA	20	U	20	344	U	344	21	U	21	21	U	21	349	U	349
Diethyl phthalate	SVOA	26	U	26	344	U	344	28	U	28	27	U	27	349	U	349
Dimethyl phthalate	SVOA	23	U	23	344	U	344	24	U	24	24	U	24	349	U	349
Di-n-butylphthalate	SVOA	29	U	29	344	U	344	31	U	31	30	U	30	349	U	349
Di-n-octylphthalate	SVOA	15	U	15	344	U	344	15	U	15	15	U	15	349	U	349
Fluoranthene	SVOA	37	U	37	954		344	57	J	38	38	U	38	349	U	349
Fluorene	SVOA	18	U	18	344	U	344	19	U	19	19	U	19	349	U	349
Hexachlorobenzene	SVOA	29	U	29	344	U	344	31	U	31	30	U	30	349	U	349
Hexachlorobutadiene	SVOA	10	U	10	344	U	344	11	U	11	11	U	11	349	U	349
Hexachlorocyclopentadiene	SVOA	51	U	51	344	UJ	344	53	U	53	53	U	53	349	UJ	349
Hexachloroethane	SVOA	22	U	22	344	U	344	23	U	23	22	U	22	349	U	349
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	397		344	23	U	23	23	U	23	349	U	349
Isophorone	SVOA	17	U	17	344	U	344	18	U	18	18	U	18	349	U	349
Naphthalene	SVOA	31	U	31	344	U	344	33	U	33	33	U	33	349	U	349
Nitrobenzene	SVOA	22	U	22	344	U	344	23	U	23	23	U	23	349	U	349
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	344	U	344	33	U	33	33	U	33	349	U	349
N-Nitrosodiphenylamine	SVOA	21	U	21	344	U	344	22	U	22	22	U	22	349	U	349
Pentachlorophenol	SVOA	340	U	340	1720	UJ	1720	350	U	350	350	U	350	1740	UJ	1740
Phenanthrene	SVOA	17	U	17	78.4	J	344	39	J	18	18	U	18	349	U	349
Phenol	SVOA	18	U	18	344	U	344	19	U	19	19	U	19	349	U	349
Pyrene	SVOA	12	U	12	868		344	68	J	13	13	U	13	349	U	349

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	DZ-8 re-sample 1, J1FKK8			DZ-8 re-sample 2, J1HH85			DZ-9 - J19YD9			DZ-9 re-sample 1, J1FKK9			DZ-10 - J19YF0		
		3/16/11			4/13/11			5/18/10			3/16/11			5/18/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	28	U	28	335	UJ	335	27	U	27	343	UJ	343
1,2-Dichlorobenzene	SVOA	23	U	23	22	U	22	335	U	335	22	U	22	343	U	343
1,3-Dichlorobenzene	SVOA	13	U	13	12	U	12	335	U	335	12	U	12	343	U	343
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	335	U	335	13	U	13	343	U	343
2,4,5-Trichlorophenol	SVOA	11	U	11	10	U	10	335	UJ	335	9.8	U	9.8	343	UJ	343
2,4,6-Trichlorophenol	SVOA	11	U	11	10	U	10	335	UJ	335	9.8	U	9.8	343	UJ	343
2,4-Dichlorophenol	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
2,4-Dimethylphenol	SVOA	70	U	70	67	U	67	335	U	335	65	U	65	343	U	343
2,4-Dinitrophenol	SVOA	350	U	350	340	U	340	1680	UJ	1680	330	U	330	1720	UJ	1720
2,4-Dinitrotoluene	SVOA	70	U	70	67	U	67	335	U	335	65	U	65	343	U	343
2,6-Dinitrotoluene	SVOA	30	U	30	28	U	28	335	U	335	27	U	27	343	U	343
2-Chloronaphthalene	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
2-Chlorophenol	SVOA	22	U	22	21	U	21	335	U	335	21	U	21	343	U	343
2-Methylnaphthalene	SVOA	20	U	20	19	U	19	335	U	335	19	U	19	343	U	343
2-Methylphenol (cresol, o-)	SVOA	14	U	14	13	U	13	335	U	335	13	U	13	343	U	343
2-Nitroaniline	SVOA	53	U	53	51	U	51	1680	U	1680	49	U	49	1720	U	1720
2-Nitrophenol	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
3,3'-Dichlorobenzidine	SVOA	95	U	95	91	U	91	670	U	670	88	U	88	687	U	687
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	34	U	34	335	U	335	32	U	32	343	U	343
3-Nitroaniline	SVOA	77	U	77	74	U	74	1680	U	1680	71	U	71	1720	U	1720
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	340	U	340	335	UJ	335	320	U	320	343	UJ	343
4-Bromophenylphenyl ether	SVOA	20	U	20	19	U	19	335	U	335	19	U	19	343	U	343
4-Chloro-3-methylphenol	SVOA	70	U	70	67	U	67	335	U	335	65	U	65	343	U	343
4-Chloroaniline	SVOA	86	U	86	83	U	83	335	U	335	80	U	80	343	U	343
4-Chlorophenylphenyl ether	SVOA	22	U	22	21	U	21	335	U	335	21	U	21	343	U	343
4-Nitroaniline	SVOA	76	U	76	74	U	74	1680	U	1680	71	U	71	1720	U	1720
4-Nitrophenol	SVOA	100	U	100	98	U	98	1680	U	1680	95	U	95	1720	U	1720
Acenaphthene	SVOA	11	U	11	10	U	10	335	U	335	10	U	10	343	U	343
Acenaphthylene	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Anthracene	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Benzo(a)anthracene	SVOA	21	U	21	20	U	20	335	U	335	20	U	20	343	U	343
Benzo(a)pyrene	SVOA	21	U	21	20	U	20	335	U	335	20	U	20	343	U	343
Benzo(b)fluoranthene	SVOA	28	U	28	27	U	27	335	U	335	26	U	26	343	U	343
Benzo(ghi)perylene	SVOA	17	U	17	16	U	16	335	U	335	16	U	16	343	U	343
Benzo(k)fluoranthene	SVOA	42	U	42	41	U	41	335	U	335	39	U	39	343	U	343
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	23	U	23	335	U	335	23	U	23	343	U	343
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	23	U	23	335	U	335	23	U	23	343	U	343
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	335	U	335	16	U	16	343	U	343
Bis(2-ethylhexyl) phthalate	SVOA	48	U	48	69	JB	47	335	U	335	45	U	45	343	U	343
Butylbenzylphthalate	SVOA	45	U	45	44	U	44	335	U	335	42	U	42	343	U	343
Carbazole	SVOA	38	U	38	37	U	37	335	U	335	35	U	35	343	U	343
Chrysene	SVOA	28	U	28	27	U	27	335	U	335	26	U	26	343	U	343
Dibenz[a,h]anthracene	SVOA	20	U	20	19	U	19	335	U	335	19	U	19	343	U	343
Dibenzofuran	SVOA	21	U	21	20	U	20	335	U	335	20	U	20	343	U	343
Diethyl phthalate	SVOA	27	U	27	26	U	26	335	U	335	25	U	25	343	U	343
Dimethyl phthalate	SVOA	24	U	24	23	U	23	335	U	335	23	U	23	343	U	343
Di-n-butylphthalate	SVOA	31	U	31	29	U	29	335	U	335	28	U	28	343	U	343
Di-n-octylphthalate	SVOA	15	U	15	15	U	15	335	U	335	14	U	14	343	U	343
Fluoranthene	SVOA	38	U	38	37	U	37	335	U	335	35	U	35	343	U	343
Fluorene	SVOA	19	U	19	18	U	18	335	U	335	18	U	18	343	U	343
Hexachlorobenzene	SVOA	31	U	31	29	U	29	335	U	335	28	U	28	343	U	343
Hexachlorobutadiene	SVOA	11	U	11	10	U	10	335	U	335	9.8	U	9.8	343	U	343
Hexachlorocyclopentadiene	SVOA	53	U	53	51	U	51	335	UJ	335	49	U	49	343	UJ	343
Hexachloroethane	SVOA	22	U	22	22	U	22	335	U	335	21	U	21	343	U	343
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	22	U	22	335	U	335	22	U	22	343	U	343
Isophorone	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Naphthalene	SVOA	33	U	33	31	U	31	335	U	335	30	U	30	343	U	343
Nitrobenzene	SVOA	23	U	23	22	U	22	335	U	335	22	U	22	343	U	343
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	31	U	31	335	U	335	30	U	30	343	U	343
N-Nitrosodiphenylamine	SVOA	22	U	22	21	U	21	335	U	335	21	U	21	343	U	343
Pentachlorophenol	SVOA	350	U	350	340	U	340	1680	UJ	1680	320	U	320	1720	UJ	1720
Phenanthrene	SVOA	18	U	18	17	U	17	335	U	335	17	U	17	343	U	343
Phenol	SVOA	19	U	19	18	U	18	335	U	335	18	U	18	343	U	343
Pyrene	SVOA	13	U	13	12	U	12	335	U	335	12	U	12	343	U	343

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CONSTITUENT	CLASS	DZ-10 re-sample 1, J1FKL0 3/16/11			DZ-11 - J19YF1 5/18/10			DZ-11 re-sample 1, J1FKL1 3/16/11			DZ-12 - J19YF2 5/18/10			DZ-12 re-sample 1, J1FKL2 3/16/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	350	U	350	31	U	31	340	U	340	29	U	29
1,2-Dichlorobenzene	SVOA	22	U	22	350	U	350	24	U	24	340	U	340	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	350	U	350	13	U	13	340	U	340	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	350	U	350	15	U	15	340	U	340	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2,4,6-Trichlorophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2,4-Dichlorophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2,4-Dimethylphenol	SVOA	67	U	67	350	U	350	73	U	73	340	U	340	69	U	69
2,4-Dinitrophenol	SVOA	340	U	340	1750	U	1750	370	U	370	1700	U	1700	350	U	350
2,4-Dinitrotoluene	SVOA	67	U	67	350	U	350	73	U	73	340	U	340	69	U	69
2,6-Dinitrotoluene	SVOA	29	U	29	350	U	350	31	U	31	340	U	340	29	U	29
2-Chloronaphthalene	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
2-Chlorophenol	SVOA	21	U	21	350	U	350	23	U	23	340	U	340	22	U	22
2-Methylnaphthalene	SVOA	19	U	19	350	U	350	21	U	21	340	U	340	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	350	U	350	14	U	14	340	U	340	14	U	14
2-Nitroaniline	SVOA	51	U	51	1750	U	1750	55	U	55	1700	U	1700	52	U	52
2-Nitrophenol	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
3,3'-Dichlorobenzidine	SVOA	92	U	92	700	U	700	99	U	99	679	U	679	94	U	94
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	350	U	350	36	U	36	340	U	340	34	U	34
3-Nitroaniline	SVOA	74	U	74	1750	U	1750	80	U	80	1700	U	1700	76	U	76
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	350	U	350	360	U	360	340	U	340	340	U	340
4-Bromophenylphenyl ether	SVOA	19	U	19	350	U	350	21	U	21	340	U	340	20	U	20
4-Chloro-3-methylphenol	SVOA	67	U	67	350	U	350	73	U	73	340	U	340	69	U	69
4-Chloroaniline	SVOA	83	U	83	350	U	350	90	U	90	340	U	340	85	U	85
4-Chlorophenylphenyl ether	SVOA	21	U	21	350	U	350	23	U	23	340	U	340	22	U	22
4-Nitroaniline	SVOA	74	U	74	1750	U	1750	80	U	80	1700	U	1700	76	U	76
4-Nitrophenol	SVOA	99	U	99	1750	U	1750	110	U	110	1700	U	1700	100	U	100
Acenaphthene	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	11	U	11
Acenaphthylene	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Anthracene	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Benzo(a)anthracene	SVOA	20	U	20	350	U	350	22	U	22	340	U	340	21	U	21
Benzo(a)pyrene	SVOA	20	U	20	350	U	350	22	U	22	340	U	340	21	U	21
Benzo(b)fluoranthene	SVOA	27	U	27	350	U	350	29	U	29	340	U	340	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	350	U	350	18	U	18	340	U	340	17	U	17
Benzo(k)fluoranthene	SVOA	41	U	41	350	U	350	44	U	44	55.4	J	340	42	U	42
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	350	U	350	25	U	25	340	U	340	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	350	U	350	25	U	25	340	U	340	24	U	24
Bis(2-chloroethyl) ether	SVOA	17	U	17	350	U	350	18	U	18	340	U	340	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	350	U	350	51	U	51	340	U	340	48	U	48
Butylbenzylphthalate	SVOA	44	U	44	350	U	350	47	U	47	340	U	340	45	U	45
Carbazole	SVOA	37	U	37	350	U	350	40	U	40	340	U	340	37	U	37
Chrysene	SVOA	28	U	28	350	U	350	30	U	30	54.1	J	340	28	U	28
Dibenz[a,h]anthracene	SVOA	19	U	19	350	U	350	21	U	21	340	U	340	20	U	20
Dibenzofuran	SVOA	20	U	20	350	U	350	22	U	22	340	U	340	21	U	21
Diethyl phthalate	SVOA	27	U	27	350	U	350	29	U	29	340	U	340	27	U	27
Dimethyl phthalate	SVOA	23	U	23	350	U	350	25	U	25	340	U	340	24	U	24
Di-n-butylphthalate	SVOA	30	U	30	350	U	350	32	U	32	340	U	340	30	U	30
Di-n-octylphthalate	SVOA	15	U	15	350	U	350	16	U	16	340	U	340	15	U	15
Fluoranthene	SVOA	37	U	37	350	U	350	40	U	40	78.6	J	340	37	U	37
Fluorene	SVOA	18	U	18	350	U	350	20	U	20	340	U	340	19	U	19
Hexachlorobenzene	SVOA	30	U	30	350	U	350	32	U	32	340	U	340	30	U	30
Hexachlorobutadiene	SVOA	10	U	10	350	U	350	11	U	11	340	U	340	10	U	10
Hexachlorocyclopentadiene	SVOA	51	U	51	350	U	350	55	U	55	340	U	340	52	U	52
Hexachloroethane	SVOA	22	U	22	350	U	350	23	U	23	340	U	340	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	350	U	350	24	U	24	340	U	340	23	U	23
Isophorone	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Naphthalene	SVOA	32	U	32	350	U	350	34	U	34	340	U	340	32	U	32
Nitrobenzene	SVOA	22	U	22	350	U	350	24	U	24	340	U	340	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	350	U	350	34	U	34	340	U	340	32	U	32
N-Nitrosodiphenylamine	SVOA	21	U	21	350	U	350	23	U	23	340	U	340	22	U	22
Pentachlorophenol	SVOA	340	U	340	1750	U	1750	360	U	360	1700	U	1700	340	U	340
Phenanthrene	SVOA	17	U	17	350	U	350	19	U	19	340	U	340	18	U	18
Phenol	SVOA	18	U	18	350	U	350	20	U	20	340	U	340	19	U	19
Pyrene	SVOA	12	U	12	350	U	350	13	U	13	78.1	J	340	13	U	13

Attachment	1	Sheet No.	52 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J19YD1 - J19YF3			Duplicate of J1FKK8, J1FKL3			Duplicate of J1HH85 re-sample 2, J1HH86			Equipment Blank - J19YK0		
		5/18/10			3/16/11			4/13/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	343	U	343	30	U	30	29	U	29	334	U	334
1,2-Dichlorobenzene	SVOA	343	U	343	24	U	24	23	U	23	334	U	334
1,3-Dichlorobenzene	SVOA	343	U	343	13	U	13	12	U	12	334	U	334
1,4-Dichlorobenzene	SVOA	343	U	343	15	U	15	14	U	14	334	U	334
2,4,5-Trichlorophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2,4,6-Trichlorophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2,4-Dichlorophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2,4-Dimethylphenol	SVOA	343	U	343	71	U	71	68	U	68	334	U	334
2,4-Dinitrophenol	SVOA	1720	U	1720	360	U	360	340	U	340	1670	U	1670
2,4-Dinitrotoluene	SVOA	343	U	343	71	U	71	68	U	68	334	U	334
2,6-Dinitrotoluene	SVOA	343	U	343	30	U	30	29	U	29	334	U	334
2-Chloronaphthalene	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
2-Chlorophenol	SVOA	343	U	343	22	U	22	22	U	22	334	U	334
2-Methylnaphthalene	SVOA	343	U	343	20	U	20	19	U	19	334	U	334
2-Methylphenol (cresol, o-)	SVOA	343	U	343	14	U	14	13	U	13	334	U	334
2-Nitroaniline	SVOA	1720	U	1720	54	U	54	51	U	51	1670	U	1670
2-Nitrophenol	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
3,3'-Dichlorobenzidine	SVOA	687	U	687	96	U	96	92	U	92	668	U	668
3+4 Methylphenol (cresol, m+p)	SVOA	343	U	343	35	U	35	34	U	34	334	U	334
3-Nitroaniline	SVOA	1720	U	1720	78	U	78	75	U	75	1670	U	1670
4,6-Dinitro-2-methylphenol	SVOA	343	U	343	350	U	350	340	U	340	334	U	334
4-Bromophenylphenyl ether	SVOA	343	U	343	20	U	20	19	U	19	334	U	334
4-Chloro-3-methylphenol	SVOA	343	U	343	71	U	71	68	U	68	334	U	334
4-Chloroaniline	SVOA	343	U	343	88	U	88	84	U	84	334	U	334
4-Chlorophenylphenyl ether	SVOA	343	U	343	22	U	22	22	U	22	334	U	334
4-Nitroaniline	SVOA	1720	U	1720	78	U	78	74	U	74	1670	U	1670
4-Nitrophenol	SVOA	1720	U	1720	100	U	100	99	U	99	1670	U	1670
Acenaphthene	SVOA	343	U	343	11	U	11	11	U	11	334	U	334
Acenaphthylene	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Anthracene	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Benzo(a)anthracene	SVOA	343	U	343	21	U	21	20	U	20	334	U	334
Benzo(a)pyrene	SVOA	343	U	343	21	U	21	20	U	20	334	U	334
Benzo(b)fluoranthene	SVOA	343	U	343	28	U	28	27	U	27	334	U	334
Benzo(ghi)perylene	SVOA	343	U	343	17	U	17	16	U	16	334	U	334
Benzo(k)fluoranthene	SVOA	343	U	343	43	U	43	41	U	41	334	U	334
Bis(2-chloro-1-methylethyl)ether	SVOA	343	U	343	25	U	25	24	U	24	334	U	334
Bis(2-Chloroethoxy)methane	SVOA	343	U	343	25	U	25	24	U	24	334	U	334
Bis(2-chloroethyl) ether	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Bis(2-ethylhexyl) phthalate	SVOA	343	U	343	49	U	49	83	JB	47	334	U	334
Butylbenzylphthalate	SVOA	343	U	343	46	U	46	44	U	44	334	U	334
Carbazole	SVOA	343	U	343	39	U	39	37	U	37	334	U	334
Chrysene	SVOA	343	U	343	29	U	29	28	U	28	334	U	334
Dibenz[a,h]anthracene	SVOA	343	U	343	20	U	20	19	U	19	334	U	334
Dibenzofuran	SVOA	343	U	343	21	U	21	20	U	20	334	U	334
Diethyl phthalate	SVOA	343	U	343	28	U	28	27	U	27	116	J	334
Dimethyl phthalate	SVOA	343	U	343	25	U	25	24	U	24	334	U	334
Di-n-butylphthalate	SVOA	343	U	343	31	U	31	30	U	30	58.7	J	334
Di-n-octylphthalate	SVOA	343	U	343	15	U	15	15	U	15	334	U	334
Fluoranthene	SVOA	343	U	343	39	U	39	37	U	37	334	U	334
Fluorene	SVOA	343	U	343	19	U	19	18	U	18	334	U	334
Hexachlorobenzene	SVOA	343	U	343	31	U	31	30	U	30	334	U	334
Hexachlorobutadiene	SVOA	343	U	343	11	U	11	10	U	10	334	U	334
Hexachlorocyclopentadiene	SVOA	343	U	343	54	U	54	51	U	51	334	U	334
Hexachloroethane	SVOA	343	U	343	23	U	23	22	U	22	334	U	334
Indeno(1,2,3-cd)pyrene	SVOA	343	U	343	24	U	24	23	U	23	334	U	334
Isophorone	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Naphthalene	SVOA	343	U	343	33	U	33	32	U	32	334	U	334
Nitrobenzene	SVOA	343	U	343	24	U	24	23	U	23	334	U	334
N-Nitroso-di-n-dipropylamine	SVOA	343	U	343	33	U	33	32	U	32	334	U	334
N-Nitrosodiphenylamine	SVOA	343	U	343	22	U	22	22	U	22	334	U	334
Pentachlorophenol	SVOA	1720	U	1720	350	U	350	340	U	340	1670	U	1670
Phenanthrene	SVOA	343	U	343	18	U	18	17	U	17	334	U	334
Phenol	SVOA	343	U	343	19	U	19	18	U	18	334	U	334
Pyrene	SVOA	343	U	343	13	U	13	12	U	12	334	U	334

Attachment	1	Sheet No.	53 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-5 - J19YF8			Duplicate of J19YF8 - J19YH6			OB-1 - J19YF4			OB-2 - J19YF5			OB-3 - J19YF6		
		5/13/10			5/13/10			5/13/10			5/13/10			5/13/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Acenaphthylene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Anthracene	PAH	1.66	J	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Benzo(a)anthracene	PAH	5.88		3.25	4.07		3.25	3.35	U	3.35	3.26	U	3.26	0.974	J	3.35
Benzo(a)pyrene	PAH	7.38		3.25	4.25		3.25	3.35	U	3.35	1.24	J	3.26	1.7	J	3.35
Benzo(b)fluoranthene	PAH	8.77		3.25	7.52		3.25	3.35	U	3.35	3.26	U	3.26	1.44	J	3.35
Benzo(ghi)perylene	PAH	4.89		3.25	3.03	J	3.25	3.35	U	3.35	3.26	U	3.26	1.56	J	3.35
Benzo(k)fluoranthene	PAH	3.72		3.25	2.31	J	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Chrysene	PAH	3.77		3.25	1.17	J	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Dibenz[a,h]anthracene	PAH	0.894	J	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Fluoranthene	PAH	21		3.25	9.18		3.25	3.98		3.35	1.39	J	3.26	6.45		3.35
Fluorene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Indeno(1,2,3-cd)pyrene	PAH	5.72		3.25	4.02		3.25	0.839	J	3.35	1.08	J	3.26	1.56	J	3.35
Naphthalene	PAH	3.25	U	3.25	3.25	U	3.25	3.35	U	3.35	3.26	U	3.26	3.35	U	3.35
Phenanthrene	PAH	6.78		3.25	3.08	J	3.25	1.31	J	3.35	1.19	J	3.26	1.38	J	3.35
Pyrene	PAH	17.2		3.25	7.13		3.25	1.44	J	3.35	1.27	J	3.26	3.14	J	3.35
Aroclor-1016	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1221	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1232	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1242	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1248	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1254	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aroclor-1260	PCB	13.2	U	13.2	13.2	U	13.2	13.4	U	13.4	13.3	U	13.3	13.2	U	13.2
Aldrin	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Alpha-BHC	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
alpha-Chlordane	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Beta-BHC	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Delta-BHC	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
4,4'-DDD	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
4,4'-DDE	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
4,4'-DDT	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Dieldrin	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endosulfan I	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endosulfan II	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endosulfan sulfate	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endrin	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endrin aldehyde	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Endrin ketone	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
gamma-Chlordane	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Heptachlor	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Heptachlor epoxide	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Methoxychlor	PEST	1.33	UD	1.33	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33	1.32	UD	1.32
Toxaphene	PEST	19.9	UD	19.9	19.8	UD	19.8	20.1	UD	20.1	20	UD	20	19.8	UD	19.8

Attachment	1	Sheet No.	54 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-4 - J19YF7			OB-6 - J19YF9			OB-7 - J19YH0			OB-8 - J19YH1			OB-8 re-sample 1, J1FKL6		
		5/13/10			5/13/10			5/13/10			5/13/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.28	U	3.28	3.24	U	3.24	3.34	U	3.34	1720	D	26.8	10	U	10
Acenaphthylene	PAH	3.28	U	3.28	3.24	U	3.24	3.34	U	3.34	26.8	U	26.8	9.3	U	9.3
Anthracene	PAH	3.28	U	3.28	3.24	U	3.24	37.5		3.34	421	D	26.8	3.1	U	3.1
Benzo(a)anthracene	PAH	0.919	J	3.28	4.65		3.24	55.5		3.34	746	D	26.8	18		3.3
Benzo(a)pyrene	PAH	1.44	J	3.28	7.63		3.24	68.8		3.34	729	D	26.8	17		6.6
Benzo(b)fluoranthene	PAH	1.07	J	3.28	9.71		3.24	71.0		3.34	912	D	26.8	18		4.3
Benzo(ghi)perylene	PAH	0.837	J	3.28	9.53		3.24	36.8		3.34	504	D	26.8	7.4	U	7.4
Benzo(k)fluoranthene	PAH	3.28	U	3.28	3.92		3.24	30.4		3.34	410	D	26.8	9.2	J	4.1
Chrysene	PAH	1.46	J	3.28	5.51		3.24	39.9		3.34	408	D	26.8	16	J	5.0
Dibenz[a,h]anthracene	PAH	3.28	U	3.28	1.43	J	3.24	8.73		3.34	138	D	26.8	11	U	11
Fluoranthene	PAH	6.55		3.28	15.3		3.24	161		3.34	2380	D	26.8	13	U	13
Fluorene	PAH	3.28	U	3.28	3.24	U	3.24	4.38		3.34	236	D	26.8	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	1.18	J	3.28	7.89		3.24	42.4		3.34	578	D	26.8	14	J	12
Naphthalene	PAH	3.28	U	3.28	3.24	U	3.24	3.34	U	3.34	284	D	26.8	12	U	12
Phenanthrene	PAH	1.61	J	3.28	4.49		3.24	86.9		3.34	1540	D	26.8	15	J	12
Pyrene	PAH	2.38	J	3.28	9.13		3.24	176		3.34	2470	D	26.8	34	J	12
Aroclor-1016	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.9	U	2.9
Aroclor-1221	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	8.5	U	8.5
Aroclor-1232	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.1	U	2.1
Aroclor-1242	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	4.9	U	4.9
Aroclor-1248	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	4.9	U	4.9
Aroclor-1254	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.7	U	2.7
Aroclor-1260	PCB	13.3	U	13.3	13.4	U	13.4	13.3	U	13.3	13.5	U	13.5	2.7	U	2.7
Aldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.26	U	0.26
Alpha-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.23	U	0.23
alpha-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.34	U	0.34
Beta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.70	U	0.70
Delta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.42	U	0.42
4,4'-DDD	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.57	U	0.57
4,4'-DDE	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.45	JX	0.25
4,4'-DDT	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.62	U	0.62
Dieldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.22	U	0.22
Endosulfan I	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.19	U	0.19
Endosulfan II	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.30	U	0.30
Endosulfan sulfate	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.29	U	0.29
Endrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.32	U	0.32
Endrin aldehyde	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.18	U	0.18
Endrin ketone	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.51	U	0.51
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.49	U	0.49
gamma-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.28	U	0.28
Heptachlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.23	U	0.23
Heptachlor epoxide	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.45	U	0.45
Methoxychlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	1.35	UD	1.35	0.47	U	0.47
Toxaphene	PEST	20	UD	20	20.1	UD	20.1	20	UD	20	20.2	UD	20.2	17	U	17

Attachment	1	Sheet No.	55 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-9 - J19YH2			OB-10 - J19YH3			OB-11 - J19YH4			OB-12 - J19YH5			OB-13 - J1B4H9		
		5/13/10			5/13/10			5/13/10			5/13/10			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	21.9		3.25	3.32	U	3.32	7.1		3.18	3.36	U	3.36	7.96		3.33
Acenaphthylene	PAH	3.25	U	3.25	3.32	U	3.32	3.18	U	3.18	3.36	U	3.36	3.33	U	3.33
Anthracene	PAH	58.4		3.25	1.88	J	3.32	2.43	J	3.18	1.41	J	3.36	3.33	U	3.33
Benzo(a)anthracene	PAH	94.5		3.25	13.3		3.32	21.3		3.18	13.7		3.36	10.2		3.33
Benzo(a)pyrene	PAH	85.3		3.25	11.9		3.32	57.4		3.18	12.8		3.36	7.41		3.33
Benzo(b)fluoranthene	PAH	84.1		3.25	11.7		3.32	53.5		3.18	17		3.36	15.4		3.33
Benzo(ghi)perylene	PAH	64.5		3.25	9.20		3.32	98.0		3.18	9.28		3.36	4.4		3.33
Benzo(k)fluoranthene	PAH	43.5		3.25	6.08		3.32	22.1		3.18	6.11		3.36	3.4		3.33
Chrysene	PAH	160		3.25	34.1		3.32	17.3		3.18	23.7		3.36	18.7		3.33
Dibenz[a,h]anthracene	PAH	19.0		3.25	2.49	J	3.32	10.8		3.18	1.6	J	3.36	3.33	U	3.33
Fluoranthene	PAH	269		3.25	29.1		3.32	54.6		3.18	29.5		3.36	24.6		3.33
Fluorene	PAH	32.3		3.25	1.36	J	3.32	1.11	J	3.18	3.36	U	3.36	3.33	U	3.33
Indeno(1,2,3-cd)pyrene	PAH	71.3		3.25	12.8		3.32	68.8		3.18	9.37		3.36	8.95		3.33
Naphthalene	PAH	3.25	U	3.25	3.32	U	3.32	3.18	U	3.18	3.36	U	3.36	25.1		3.33
Phenanthrene	PAH	201		3.25	11.3		3.32	14.1		3.18	10.4		3.36	7.35		3.33
Pyrene	PAH	290		3.25	39.6		3.32	51.9		3.18	28.7		3.36	18.3		3.33
Aroclor-1016	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1221	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1232	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1242	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1248	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1254	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aroclor-1260	PCB	13.4	U	13.4	13.2	U	13.2	13.1	U	13.1	13.4	U	13.4	13.3	U	13.3
Aldrin	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Alpha-BHC	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
alpha-Chlordane	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Beta-BHC	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Delta-BHC	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
4,4'-DDD	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
4,4'-DDE	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
4,4'-DDT	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Dieldrin	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endosulfan I	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endosulfan II	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endosulfan sulfate	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endrin	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endrin aldehyde	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Endrin ketone	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
gamma-Chlordane	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Heptachlor	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Heptachlor epoxide	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Methoxychlor	PEST	1.34	UD	1.34	1.32	UD	1.32	1.32	UD	1.32	1.34	UD	1.34	1.33	UD	1.33
Toxaphene	PEST	20.1	UD	20.1	19.9	UD	19.9	19.8	UD	19.8	20.1	UD	20.1	20	UD	20

Attachment	1	Sheet No.	56 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-14 - J1B4J0			OB-15 - J1B4J1			SPA-4 - J19YJ0			SPA-4 re-sample 1, J1FKM0			Duplicate of J19YJ4 - J19YJ9		
		5/17/10			5/17/10			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.33	U	3.33	3.34	U	3.34	3.34	U	3.34	9.7	U	9.7	39.1		3.35
Acenaphthylene	PAH	3.33	U	3.33	3.34	U	3.34	16.7		3.34	8.7	U	8.7	3.35	U	3.35
Anthracene	PAH	3.33	U	3.33	2.59	J	3.34	3.34	U	3.34	87		3.0	28.4		3.35
Benzo(a)anthracene	PAH	6.98		3.33	22.3		3.34	1.04	J	3.34	230		3.1	128		3.35
Benzo(a)pyrene	PAH	5.72		3.33	18.9		3.34	2.07	J	3.34	170		6.2	142		3.35
Benzo(b)fluoranthene	PAH	8.78		3.33	27.5		3.34	1.81	J	3.34	190		4.1	179		3.35
Benzo(ghi)perylene	PAH	4.07		3.33	11.6		3.34	1.15	J	3.34	96		7.0	90.1		3.35
Benzo(k)fluoranthene	PAH	2.53	J	3.33	7.86		3.34	1	J	3.34	87		3.8	67		3.35
Chrysene	PAH	8.23		3.33	32.5		3.34	3.34	U	3.34	160		4.7	117		3.35
Dibenz[a,h]anthracene	PAH	3.33	U	3.33	1.49	J	3.34	3.34	U	3.34	26	JX	11	19.2		3.35
Fluoranthene	PAH	17.9		3.33	65.9		3.34	6.67		3.34	400		13	333		3.35
Fluorene	PAH	3.33	U	3.33	1.71	J	3.34	3.34	U	3.34	57		5.1	11.9		3.35
Indeno(1,2,3-cd)pyrene	PAH	5.05		3.33	16.5		3.34	1.6	J	3.34	120		12	95.6		3.35
Naphthalene	PAH	3.33	U	3.33	3.34	U	3.34	3.34	U	3.34	12	U	12	3.35	U	3.35
Phenanthrene	PAH	6.48		3.33	26.8		3.34	1.96	J	3.34	240		12	128		3.35
Pyrene	PAH	13.8		3.33	49.6		3.34	1.49	J	3.34	400		12	346		3.35
Aroclor-1016	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.9	U	2.9	13.4	U	13.4
Aroclor-1221	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	8.3	U	8.3	13.4	U	13.4
Aroclor-1232	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.1	U	2.1	13.4	U	13.4
Aroclor-1242	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	4.8	U	4.8	13.4	U	13.4
Aroclor-1248	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	4.8	U	4.8	13.4	U	13.4
Aroclor-1254	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.7	U	2.7	13.4	U	13.4
Aroclor-1260	PCB	13.3	U	13.3	13.3	U	13.3	13.3	U	13.3	2.7	U	2.7	5.26	J	13.4
Aldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.25	U	0.25	1.34	UD	1.34
Alpha-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.21	U	0.21	1.34	UD	1.34
alpha-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.32	U	0.32	1.34	UD	1.34
Beta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.66	U	0.66	1.34	UD	1.34
Delta-BHC	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.40	U	0.40	1.34	UD	1.34
4,4'-DDD	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.54	U	0.54	1.34	UD	1.34
4,4'-DDE	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.24	U	0.24	6.74	D	6.74
4,4'-DDT	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.59	U	0.59	1.34	UD	1.34
Dieldrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.21	U	0.21	1.34	UD	1.34
Endosulfan I	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.18	U	0.18	3.02	JD	3.02
Endosulfan II	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.29	U	0.29	1.34	UD	1.34
Endosulfan sulfate	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.28	U	0.28	1.34	UD	1.34
Endrin	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.30	U	0.30	1.34	UD	1.34
Endrin aldehyde	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.17	U	0.17	1.34	UD	1.34
Endrin ketone	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.49	U	0.49	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.46	U	0.46	1.34	UD	1.34
gamma-Chlordane	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.27	U	0.27	1.34	UD	1.34
Heptachlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.21	U	0.21	1.34	UD	1.34
Heptachlor epoxide	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.42	U	0.42	1.34	UD	1.34
Methoxychlor	PEST	1.33	UD	1.33	1.34	UD	1.34	1.33	UD	1.33	0.45	U	0.45	1.34	UD	1.34
Toxaphene	PEST	20	UD	20	20.1	UD	20.1	20	UD	20	16	U	16	20.1	UD	20.1

Attachment	1	Sheet No.	57 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J1FKM0 re-sample 1, J1FKM9 3/17/11			SPA-1 - J19YH7 5/17/10			SPA-1 re-sample 1, J1FKL7 3/17/11			SPA-2 - J19YH8 5/17/10			SPA-2 re-sample 1, J1FKL8 3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.6	U	9.6	6.67	U	6.67	10	U	10	3.33	U	3.33	10	U	10
Acenaphthylene	PAH	8.6	U	8.6	6.67	U	6.67	9.3	U	9.3	34.9		3.33	27	J	9.3
Anthracene	PAH	48		2.9	71.7	D	6.67	3.1	U	3.1	3.33	U	3.33	3.1	U	3.1
Benzo(a)anthracene	PAH	170		3.1	258	D	6.67	3.3	U	3.3	7.26		3.33	3.3	U	3.3
Benzo(a)pyrene	PAH	120		6.2	307	D	6.67	6.6	U	6.6	10.5		3.33	6.8	J	6.6
Benzo(b)fluoranthene	PAH	140		4.0	338	D	6.67	4.3	U	4.3	11.2		3.33	4.3	U	4.3
Benzo(ghi)perylene	PAH	38	X	6.9	186	D	6.67	7.4	U	7.4	12.2		3.33	7.4	U	7.4
Benzo(k)fluoranthene	PAH	69		3.8	145	D	6.67	4.1	U	4.1	6.28		3.33	4.1	U	4.1
Chrysene	PAH	140		4.6	143	D	6.67	5.0	U	5.0	4.05		3.33	5.0	U	5.0
Dibenz[a,h]anthracene	PAH	19	JX	11	39.9	D	6.67	11	U	11	1.5	J	3.33	11	U	11
Fluoranthene	PAH	290		12	731	D	6.67	13	U	13	29.7		3.33	13	U	13
Fluorene	PAH	31		5.1	32.9	D	6.67	5.4	U	5.4	3.33	U	3.33	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	110		12	211	D	6.67	12	U	12	11.6		3.33	12	U	12
Naphthalene	PAH	12	U	12	6.67	U	6.67	12	U	12	3.33	U	3.33	12	U	12
Phenanthrene	PAH	130		12	247	D	6.67	12	U	12	10.6		3.33	12	U	12
Pyrene	PAH	300		12	790	D	6.67	12	U	12	22		3.33	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	13.4	U	13.4	2.8	U	2.8	13.3	U	13.3	2.6	U	2.6
Aroclor-1221	PCB	8.0	U	8.0	13.4	U	13.4	8.1	U	8.1	13.3	U	13.3	7.6	U	7.6
Aroclor-1232	PCB	2.0	U	2.0	13.4	U	13.4	2.0	U	2.0	13.3	U	13.3	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.3	U	13.3	4.4	U	4.4
Aroclor-1248	PCB	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.3	U	13.3	4.4	U	4.4
Aroclor-1254	PCB	2.6	U	2.6	13.4	U	13.4	2.6	U	2.6	13.3	U	13.3	2.5	U	2.5
Aroclor-1260	PCB	2.6	U	2.6	13.4	U	13.4	2.6	U	2.6	13.3	U	13.3	2.5	U	2.5
Aldrin	PEST	0.26	U	0.26	1.34	UD	1.34	0.25	U	0.25	1.33	UD	1.33	0.26	U	0.26
Alpha-BHC	PEST	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.33	UD	1.33	0.22	U	0.22
alpha-Chlordane	PEST	0.33	U	0.33	1.34	UD	1.34	0.33	U	0.33	1.33	UD	1.33	0.33	U	0.33
Beta-BHC	PEST	0.69	U	0.69	1.34	UD	1.34	0.67	U	0.67	1.33	UD	1.33	0.68	U	0.68
Delta-BHC	PEST	0.41	U	0.41	1.34	UD	1.34	0.40	U	0.40	1.33	UD	1.33	0.41	U	0.41
4,4'-DDD	PEST	0.56	U	0.56	1.34	UD	1.34	0.55	U	0.55	1.33	UD	1.33	0.56	U	0.56
4,4'-DDE	PEST	0.25	U	0.25	1.51	JD	1.51	0.24	U	0.24	1.33	UD	1.33	0.24	U	0.24
4,4'-DDT	PEST	0.61	U	0.61	1.34	UD	1.34	0.59	U	0.59	1.33	UD	1.33	0.60	U	0.60
Dieldrin	PEST	0.22	U	0.22	1.34	UD	1.34	0.21	U	0.21	1.33	UD	1.33	0.21	U	0.21
Endosulfan I	PEST	0.18	U	0.18	1.34	UD	1.34	0.18	U	0.18	1.33	UD	1.33	0.18	U	0.18
Endosulfan II	PEST	0.30	U	0.30	1.34	UD	1.34	0.29	U	0.29	1.33	UD	1.33	0.29	U	0.29
Endosulfan sulfate	PEST	0.29	U	0.29	1.34	UD	1.34	0.28	U	0.28	1.33	UD	1.33	0.28	U	0.28
Endrin	PEST	0.32	U	0.32	1.34	UD	1.34	0.31	U	0.31	1.33	UD	1.33	0.31	U	0.31
Endrin aldehyde	PEST	0.18	U	0.18	1.34	UD	1.34	0.17	U	0.17	1.33	UD	1.33	0.17	U	0.17
Endrin ketone	PEST	0.51	U	0.51	1.34	UD	1.34	0.49	U	0.49	1.33	UD	1.33	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.48	U	0.48	1.34	UD	1.34	0.47	U	0.47	1.33	UD	1.33	0.47	U	0.47
gamma-Chlordane	PEST	0.27	U	0.27	1.34	UD	1.34	0.27	U	0.27	1.33	UD	1.33	0.27	U	0.27
Heptachlor	PEST	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.33	UD	1.33	0.22	U	0.22
Heptachlor epoxide	PEST	0.44	U	0.44	1.34	UD	1.34	0.43	U	0.43	1.33	UD	1.33	0.43	U	0.43
Methoxychlor	PEST	0.46	U	0.46	1.34	UD	1.34	0.45	U	0.45	1.33	UD	1.33	0.46	U	0.46
Toxaphene	PEST	16	U	16	20.1	UD	20.1	16	U	16	19.9	UD	19.9	16	U	16

Attachment	1	Sheet No.	58 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-3 - J19YH9			SPA-3 re-sample 1, J1FKL9			SPA-5 - J19YJ1			SPA-5 re-sample 1, J1FKM1			SPA-6 - J19YJ2		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.29	U	3.29	9.7	U	9.7	6.77		3.3	9.7	U	9.7	13.2	U	13.2
Acenaphthylene	PAH	3.29	U	3.29	8.8	U	8.8	85.1		3.3	8.7	U	8.7	53.3	D	13.2
Anthracene	PAH	1.7	J	3.29	3.5	J	3.0	3.3	U	3.3	3.0	U	3.0	62.3	D	13.2
Benzo(a)anthracene	PAH	4.56		3.29	25	X	3.1	14.5		3.3	19		3.1	334	D	13.2
Benzo(a)pyrene	PAH	5.52		3.29	17		6.2	10.4		3.3	22		6.2	380	D	13.2
Benzo(b)fluoranthene	PAH	4.51		3.29	20		4.1	7.95		3.3	25		4.1	366	D	13.2
Benzo(ghi)perylene	PAH	4.04		3.29	7.0	U	7.0	30.9		3.3	7.0	U	7.0	242	D	13.2
Benzo(k)fluoranthene	PAH	2.42	J	3.29	11	JX	3.8	4.23		3.3	9.8	J	3.8	183	D	13.2
Chrysene	PAH	4.91		3.29	27	J	4.7	17.8		3.3	21	J	4.7	339	D	13.2
Dibenz[a,h]anthracene	PAH	3.29	U	3.29	11	U	11	9.3		3.3	11	U	11	49.8	D	13.2
Fluoranthene	PAH	17.7		3.29	45		13	33.5		3.3	17	JX	13	905	D	13.2
Fluorene	PAH	3.29	U	3.29	5.1	U	5.1	3.3	U	3.3	5.1	U	5.1	32.2	D	13.2
Indeno(1,2,3-cd)pyrene	PAH	3.99		3.29	12	J	12	11.2		3.3	16	J	12	252	D	13.2
Naphthalene	PAH	3.29	U	3.29	12	U	12	3.3	U	3.3	12	U	12	13.2	U	13.2
Phenanthrene	PAH	5.73		3.29	13	J	12	12.1		3.3	12	U	12	326	D	13.2
Pyrene	PAH	10.6		3.29	54		12	24.2		3.3	30	J	12	956	D	13.2
Aroclor-1016	PCB	13.4	U	13.4	2.8	U	2.8	13.4	U	13.4	2.8	U	2.8	13.4	U	13.4
Aroclor-1221	PCB	13.4	U	13.4	8.2	U	8.2	13.4	U	13.4	8.1	U	8.1	13.4	U	13.4
Aroclor-1232	PCB	13.4	U	13.4	2.0	U	2.0	13.4	U	13.4	2.0	U	2.0	13.4	U	13.4
Aroclor-1242	PCB	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4
Aroclor-1248	PCB	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4	4.7	U	4.7	13.4	U	13.4
Aroclor-1254	PCB	13.4	U	13.4	2.6	U	2.6	13.4	U	13.4	15		2.6	20.8		13.4
Aroclor-1260	PCB	13.4	U	13.4	2.6	U	2.6	13.4	U	13.4	10		2.6	24.8		13.4
Aldrin	PEST	1.34	UD	1.34	0.26	U	0.26	1.34	UD	1.34	0.26	U	0.26	1.34	UD	1.34
Alpha-BHC	PEST	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34
alpha-Chlordane	PEST	1.34	UD	1.34	0.33	U	0.33	1.34	UD	1.34	0.33	U	0.33	1.34	UD	1.34
Beta-BHC	PEST	1.34	UD	1.34	0.69	U	0.69	1.34	UD	1.34	0.69	U	0.69	1.34	UD	1.34
Delta-BHC	PEST	1.34	UD	1.34	0.42	U	0.42	1.34	UD	1.34	0.41	U	0.41	1.34	UD	1.34
4,4'-DDD	PEST	1.34	UD	1.34	0.57	U	0.57	1.34	UD	1.34	0.56	U	0.56	1.34	UD	1.34
4,4'-DDE	PEST	1.34	UD	1.34	0.25	U	0.25	1.34	UD	1.34	14		0.25	268	D	268
4,4'-DDT	PEST	1.34	UD	1.34	0.61	U	0.61	1.34	UD	1.34	5.3		0.61	17.5	D	17.5
Dieldrin	PEST	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34
Endosulfan I	PEST	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34
Endosulfan II	PEST	1.34	UD	1.34	0.30	U	0.30	1.34	UD	1.34	0.30	U	0.30	1.34	UD	1.34
Endosulfan sulfate	PEST	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34
Endrin	PEST	1.34	UD	1.34	0.32	U	0.32	1.34	UD	1.34	0.32	U	0.32	1.34	UD	1.34
Endrin aldehyde	PEST	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34	0.18	U	0.18	1.34	UD	1.34
Endrin ketone	PEST	1.34	UD	1.34	0.51	U	0.51	1.34	UD	1.34	0.51	U	0.51	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	0.48	U	0.48	1.34	UD	1.34	0.48	U	0.48	1.34	UD	1.34
gamma-Chlordane	PEST	1.34	UD	1.34	0.28	U	0.28	1.34	UD	1.34	0.27	U	0.27	1.34	UD	1.34
Heptachlor	PEST	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34	0.22	U	0.22	1.34	UD	1.34
Heptachlor epoxide	PEST	1.34	UD	1.34	0.44	U	0.44	1.34	UD	1.34	0.44	U	0.44	1.34	UD	1.34
Methoxychlor	PEST	1.34	UD	1.34	0.47	U	0.47	1.34	UD	1.34	0.47	U	0.47	1.34	UD	1.34
Toxaphene	PEST	20.1	UD	20.1	16	U	16	20.1	UD	20.1	16	U	16	20.1	UD	20.1

Attachment	1	Sheet No.	59 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-9 - J19YJ5			SPA-9 re-sample 1, J1FKM5			SPA-10 - J19YJ6			SPA-10 re-sample 1, J1FKM6			SPA-11 - J19YJ7		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	3.34	U	3.34	11	U	11	3.34	U	3.34	9.8	U	9.8	3.29	U	3.29
Acenaphthylene	PAH	3.34	U	3.34	9.7	U	9.7	3.34	U	3.34	8.8	U	8.8	13		3.29
Anthracene	PAH	4.66		3.34	3.3	U	3.3	4.65		3.34	3.0	U	3.0	6.44		3.29
Benzo(a)anthracene	PAH	61.2		3.34	8.9	J	3.5	68.6		3.34	3.1	U	3.1	57.5		3.29
Benzo(a)pyrene	PAH	64.5		3.34	9.6	J	6.9	75.1		3.34	6.3	U	6.3	72.4		3.29
Benzo(b)fluoranthene	PAH	81.8		3.34	4.5	U	4.5	98.4		3.34	4.1	U	4.1	91.8		3.29
Benzo(ghi)perylene	PAH	46.2		3.34	7.8	U	7.8	54.7		3.34	7.0	U	7.0	50.6		3.29
Benzo(k)fluoranthene	PAH	30		3.34	4.3	U	4.3	37.2		3.34	3.8	U	3.8	32.9		3.29
Chrysene	PAH	101		3.34	8.7	J	5.2	107		3.34	4.7	U	4.7	67.6		3.29
Dibenz[a,h]anthracene	PAH	8.71		3.34	12	U	12	10.6		3.34	11	U	11	8.93		3.29
Fluoranthene	PAH	149		3.34	14	U	14	220		3.34	13	U	13	171		3.29
Fluorene	PAH	2.89	J	3.34	5.7	U	5.7	7.59		3.34	5.2	U	5.2	3.05	J	3.29
Indeno(1,2,3-cd)pyrene	PAH	46.8		3.34	13	U	13	54.5		3.34	12	U	12	52.7		3.29
Naphthalene	PAH	16.4		3.34	13	U	13	7.54		3.34	12	U	12	13.7		3.29
Phenanthrene	PAH	41.7		3.34	13	U	13	65.9		3.34	12	U	12	51.1		3.29
Pyrene	PAH	148		3.34	21	J	13	185		3.34	12	U	12	158		3.29
Aroclor-1016	PCB	13.4	U	13.4	2.9	U	2.9	13.3	U	13.3	2.6	U	2.6	13.4	U	13.4
Aroclor-1221	PCB	13.4	U	13.4	8.5	U	8.5	13.3	U	13.3	7.6	U	7.6	13.4	U	13.4
Aroclor-1232	PCB	13.4	U	13.4	2.1	U	2.1	13.3	U	13.3	1.9	U	1.9	13.4	U	13.4
Aroclor-1242	PCB	13.4	U	13.4	5.0	U	5.0	13.3	U	13.3	4.4	U	4.4	13.4	U	13.4
Aroclor-1248	PCB	13.4	U	13.4	5.0	U	5.0	13.3	U	13.3	4.4	U	4.4	13.4	U	13.4
Aroclor-1254	PCB	13	J	13.4	2.8	U	2.8	16.4		13.3	2.5	U	2.5	13.4	U	13.4
Aroclor-1260	PCB	11.7	J	13.4	2.8	U	2.8	16.8		13.3	2.5	U	2.5	5.37	J	13.4
Aldrin	PEST	1.34	UD	1.34	0.28	U	0.28	1.34	UD	1.34	0.25	U	0.25	1.34	UD	1.34
Alpha-BHC	PEST	1.34	UD	1.34	0.23	U	0.23	1.34	UD	1.34	0.21	U	0.21	1.34	UD	1.34
alpha-Chlordane	PEST	1.34	UD	1.34	0.35	U	0.35	1.34	UD	1.34	0.32	U	0.32	1.34	UD	1.34
Beta-BHC	PEST	1.34	UD	1.34	0.73	U	0.73	1.34	UD	1.34	0.67	U	0.67	1.34	UD	1.34
Delta-BHC	PEST	1.34	UD	1.34	0.44	U	0.44	1.34	UD	1.34	0.40	U	0.40	1.34	UD	1.34
4,4'-DDD	PEST	1.34	UD	1.34	0.60	U	0.60	1.34	UD	1.34	0.55	U	0.55	1.34	UD	1.34
4,4'-DDE	PEST	24.7	D	24.7	0.26	U	0.26	10.3	D	10.3	0.24	U	0.24	4.87	JD	4.87
4,4'-DDT	PEST	2.54	JD	2.54	0.65	U	0.65	1.84	JD	1.84	0.59	U	0.59	1.34	UD	1.34
Dieldrin	PEST	1.34	UD	1.34	0.23	U	0.23	1.34	UD	1.34	0.21	U	0.21	1.34	UD	1.34
Endosulfan I	PEST	1.34	UD	1.34	0.19	U	0.19	4.68	JD	4.68	0.18	U	0.18	1.34	UD	1.34
Endosulfan II	PEST	1.34	UD	1.34	0.31	U	0.31	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34
Endosulfan sulfate	PEST	1.34	UD	1.34	0.30	U	0.30	1.34	UD	1.34	0.28	U	0.28	1.34	UD	1.34
Endrin	PEST	1.34	UD	1.34	0.34	U	0.34	1.34	UD	1.34	0.31	U	0.31	1.34	UD	1.34
Endrin aldehyde	PEST	1.34	UD	1.34	0.19	U	0.19	1.34	UD	1.34	0.17	U	0.17	1.34	UD	1.34
Endrin ketone	PEST	1.34	UD	1.34	0.54	U	0.54	1.34	UD	1.34	0.49	U	0.49	1.34	UD	1.34
Gamma-BHC (Lindane)	PEST	1.34	UD	1.34	0.51	U	0.51	1.34	UD	1.34	0.46	U	0.46	1.34	UD	1.34
gamma-Chlordane	PEST	1.34	UD	1.34	0.29	U	0.29	1.34	UD	1.34	0.27	U	0.27	1.34	UD	1.34
Heptachlor	PEST	1.34	UD	1.34	0.23	U	0.23	1.34	UD	1.34	0.21	U	0.21	1.34	UD	1.34
Heptachlor epoxide	PEST	1.34	UD	1.34	0.47	U	0.47	1.34	UD	1.34	0.43	U	0.43	1.34	UD	1.34
Methoxychlor	PEST	1.34	UD	1.34	0.49	U	0.49	1.34	UD	1.34	0.45	U	0.45	1.34	UD	1.34
Toxaphene	PEST	20.1	UD	20.1	17	U	17	20.1	UD	20.1	16	U	16	20.1	UD	20.1

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-11 re-sample 1, J1FKM7			SPA-12 - J19YJ8			SPA-12 re-sample 1, J1FKM8		
		3/17/11			5/17/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	3.34	U	3.34	10	U	10
Acenaphthylene	PAH	9.1	U	9.1	3.34	U	3.34	9.3	U	9.3
Anthracene	PAH	3.1	U	3.1	4.89		3.34	3.2	U	3.2
Benzo(a)anthracene	PAH	3.2	U	3.2	47.8		3.34	44		3.3
Benzo(a)pyrene	PAH	6.5	U	6.5	52.4		3.34	27		6.6
Benzo(b)fluoranthene	PAH	4.3	U	4.3	67.8		3.34	37		4.3
Benzo(ghi)perylene	PAH	7.3	U	7.3	61.3		3.34	7.5	U	7.5
Benzo(k)fluoranthene	PAH	4.0	U	4.0	25.1		3.34	14	J	4.1
Chrysene	PAH	4.9	U	4.9	70.2		3.34	35	J	5.0
Dibenz[a,h]anthracene	PAH	11	U	11	8.69		3.34	11	U	11
Fluoranthene	PAH	13	U	13	139		3.34	13	U	13
Fluorene	PAH	5.4	U	5.4	2.49	J	3.34	5.5	U	5.5
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	56.8		3.34	27	J	12
Naphthalene	PAH	12	U	12	3.34	U	3.34	12	U	12
Phenanthrene	PAH	12	U	12	52		3.34	14	J	12
Pyrene	PAH	12	U	12	123		3.34	65		12
Aroclor-1016	PCB	2.8	U	2.8	13.2	U	13.2	2.8	U	2.8
Aroclor-1221	PCB	8.0	U	8.0	13.2	U	13.2	8.2	U	8.2
Aroclor-1232	PCB	2.0	U	2.0	13.2	U	13.2	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	13.2	U	13.2	4.7	U	4.7
Aroclor-1248	PCB	4.7	U	4.7	13.2	U	13.2	4.7	U	4.7
Aroclor-1254	PCB	2.6	U	2.6	13.2	U	13.2	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	13.2	U	13.2	2.6	U	2.6
Aldrin	PEST	0.25	U	0.25	1.32	UD	1.32	0.26	U	0.26
Alpha-BHC	PEST	0.21	U	0.21	1.32	UD	1.32	0.22	U	0.22
alpha-Chlordane	PEST	0.32	U	0.32	1.32	UD	1.32	0.34	U	0.34
Beta-BHC	PEST	0.66	U	0.66	1.32	UD	1.32	0.69	U	0.69
Delta-BHC	PEST	0.40	U	0.40	1.32	UD	1.32	0.42	U	0.42
4,4'-DDD	PEST	0.54	U	0.54	1.32	UD	1.32	0.57	U	0.57
4,4'-DDE	PEST	0.24	U	0.24	2.08	JD	2.08	0.33	JX	0.25
4,4'-DDT	PEST	0.58	U	0.58	1.32	UD	1.32	0.61	U	0.61
Dieldrin	PEST	0.21	U	0.21	1.32	UD	1.32	0.22	U	0.22
Endosulfan I	PEST	0.17	U	0.17	1.32	UD	1.32	0.18	U	0.18
Endosulfan II	PEST	0.28	U	0.28	1.32	UD	1.32	0.30	U	0.30
Endosulfan sulfate	PEST	0.27	U	0.27	1.32	UD	1.32	0.29	U	0.29
Endrin	PEST	0.30	U	0.30	1.32	UD	1.32	0.32	U	0.32
Endrin aldehyde	PEST	0.17	U	0.17	1.32	UD	1.32	0.18	U	0.18
Endrin ketone	PEST	0.48	U	0.48	1.32	UD	1.32	0.51	U	0.51
Gamma-BHC (Lindane)	PEST	0.46	U	0.46	1.32	UD	1.32	0.48	U	0.48
gamma-Chlordane	PEST	0.26	U	0.26	1.32	UD	1.32	0.28	U	0.28
Heptachlor	PEST	0.21	U	0.21	1.32	UD	1.32	0.22	U	0.22
Heptachlor epoxide	PEST	0.42	U	0.42	1.32	UD	1.32	0.44	U	0.44
Methoxychlor	PEST	0.45	U	0.45	1.32	UD	1.32	0.47	U	0.47
Toxaphene	PEST	16	U	16	19.8	UD	19.8	16	U	16

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-5 - J19YF8			Duplicate of J19YF8 - J19YH6			OB-1 - J19YF4			OB-2 - J19YF5			OB-3 - J19YF6		
		5/13/10			5/13/10			5/13/10			5/13/10			5/13/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
1,2-Dichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
1,3-Dichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
1,4-Dichlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4,5-Trichlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4,6-Trichlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4-Dichlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4-Dimethylphenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,4-Dinitrophenol	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
2,4-Dinitrotoluene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2,6-Dinitrotoluene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Chloronaphthalene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Chlorophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Methylnaphthalene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Methylphenol (cresol, o-)	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
2-Nitroaniline	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
2-Nitrophenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
3,3'-Dichlorobenzidine	SVOA	663	U	663	660	U	660	667	U	667	649	U	649	659	U	659
3+4 Methylphenol (cresol, m+p)	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
3-Nitroaniline	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Bromophenylphenyl ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Chloro-3-methylphenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Chloroaniline	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Chlorophenylphenyl ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
4-Nitroaniline	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
4-Nitrophenol	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
Acenaphthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Acenaphthylene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Anthracene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(a)anthracene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(a)pyrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(b)fluoranthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(ghi)perylene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Benzo(k)fluoranthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-chloro-1-methylethyl)ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-Chloroethoxy)methane	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-chloroethyl) ether	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Bis(2-ethylhexyl) phthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Butylbenzylphthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Carbazole	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Chrysene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Dibenz[a,h]anthracene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Dibenzofuran	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Diethyl phthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Dimethyl phthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Di-n-butylphthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Di-n-octylphthalate	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Fluoranthene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Fluorene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachlorobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachlorobutadiene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachlorocyclopentadiene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Hexachloroethane	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Indeno(1,2,3-cd)pyrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Isophorone	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Naphthalene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Nitrobenzene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
N-Nitroso-di-n-dipropylamine	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
N-Nitrosodiphenylamine	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Pentachlorophenol	SVOA	1660	U	1660	1650	U	1650	1670	U	1670	1620	U	1620	1650	U	1650
Phenanthrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Phenol	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330
Pyrene	SVOA	331	U	331	330	U	330	333	U	333	324	U	324	330	U	330

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-4 - J19YF7			OB-6 - J19YF9			OB-7 - J19YH0			OB-8 - J19YH1			OB-8 re-sample 1, J1FKL6		
		5/13/10			5/13/10			5/13/10			5/13/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	29	U	29
1,2-Dichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	23	U	23
1,3-Dichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	13	U	13
1,4-Dichlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	14	U	14
2,4,5-Trichlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2,4,6-Trichlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2,4-Dichlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2,4-Dimethylphenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	69	U	69
2,4-Dinitrophenol	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	350	U	350
2,4-Dinitrotoluene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	69	U	69
2,6-Dinitrotoluene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	29	U	29
2-Chloronaphthalene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
2-Chlorophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
2-Methylnaphthalene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	20	U	20
2-Methylphenol (cresol, o-)	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	14	U	14
2-Nitroaniline	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	52	U	52
2-Nitrophenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
3,3'-Dichlorobenzidine	SVOA	662	U	662	658	U	658	647	U	647	660	U	660	94	U	94
3+4 Methylphenol (cresol, m+p)	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	34	U	34
3-Nitroaniline	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	76	U	76
4,6-Dinitro-2-methylphenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	340	U	340
4-Bromophenylphenyl ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	20	U	20
4-Chloro-3-methylphenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	69	U	69
4-Chloroaniline	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	85	U	85
4-Chlorophenylphenyl ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
4-Nitroaniline	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	76	U	76
4-Nitrophenol	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	100	U	100
Acenaphthene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	11	U	11
Acenaphthylene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	18	U	18
Anthracene	SVOA	331	U	331	329	U	329	323	U	323	191	J	330	18	U	18
Benzo(a)anthracene	SVOA	331	U	331	329	U	329	323	U	323	636		330	21	U	21
Benzo(a)pyrene	SVOA	331	U	331	329	U	329	323	U	323	558		330	71	J	21
Benzo(b)fluoranthene	SVOA	331	U	331	329	U	329	323	U	323	485		330	30	JX	27
Benzo(ghi)perylene	SVOA	331	U	331	329	U	329	323	U	323	411		330	17	U	17
Benzo(k)fluoranthene	SVOA	331	U	331	329	U	329	323	U	323	516		330	42	UX	42
Bis(2-chloro-1-methylethyl)ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	24	U	24
Bis(2-chloroethyl) ether	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	120	JB	48
Butylbenzylphthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	45	U	45
Carbazole	SVOA	331	U	331	329	U	329	323	U	323	95.9	J	330	38	U	38
Chrysene	SVOA	331	U	331	329	U	329	323	U	323	611		330	28	U	28
Dibenz[a,h]anthracene	SVOA	331	U	331	329	U	329	323	U	323	138	J	330	20	U	20
Dibenzofuran	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	21	U	21
Diethyl phthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	27	U	27
Dimethyl phthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	24	U	24
Di-n-butylphthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	30	U	30
Di-n-octylphthalate	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	15	U	15
Fluoranthene	SVOA	331	U	331	329	U	329	323	U	323	1170		330	38	U	38
Fluorene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	19	U	19
Hexachlorobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	30	U	30
Hexachlorobutadiene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	10	U	10
Hexachlorocyclopentadiene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	52	U	52
Hexachloroethane	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	331	U	331	329	U	329	323	U	323	376		330	65	J	23
Isophorone	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	18	U	18
Naphthalene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	32	U	32
Nitrobenzene	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	32	U	32
N-Nitrosodiphenylamine	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	22	U	22
Pentachlorophenol	SVOA	1650	U	1650	1640	U	1640	1620	U	1620	1650	U	1650	340	U	340
Phenanthrene	SVOA	331	U	331	329	U	329	323	U	323	579		330	18	U	18
Phenol	SVOA	331	U	331	329	U	329	323	U	323	330	U	330	19	U	19
Pyrene	SVOA	331	U	331	329	U	329	323	U	323	933		330	25	J	13

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-9 - J19YH2			OB-10 - J19YH3			OB-11 - J19YH4			OB-12 - J19YH5			OB-13 - J1B4H9		
		5/13/10			5/13/10			5/13/10			5/13/10			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
1,2-Dichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
1,3-Dichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
1,4-Dichlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4,5-Trichlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4,6-Trichlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4-Dichlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4-Dimethylphenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,4-Dinitrophenol	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
2,4-Dinitrotoluene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2,6-Dinitrotoluene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Chloronaphthalene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Chlorophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Methylnaphthalene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Methylphenol (cresol, o-)	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
2-Nitroaniline	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
2-Nitrophenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
3,3'-Dichlorobenzidine	SVOA	663	U	663	663	U	663	665	U	665	657	U	657	662	U	662
3+4 Methylphenol (cresol, m+p)	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
3-Nitroaniline	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
4,6-Dinitro-2-methylphenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Bromophenylphenyl ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Chloro-3-methylphenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Chloroaniline	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Chlorophenylphenyl ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
4-Nitroaniline	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
4-Nitrophenol	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
Acenaphthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Acenaphthylene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Anthracene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Benzo(a)anthracene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Benzo(a)pyrene	SVOA	331	U	331	331	U	331	57.4	J	333	328	U	328	331	U	331
Benzo(b)fluoranthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Benzo(ghi)perylene	SVOA	331	U	331	331	U	331	102	J	102	328	U	328	331	U	331
Benzo(k)fluoranthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-chloro-1-methylethyl)ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-Chloroethoxy)methane	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-chloroethyl) ether	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Bis(2-ethylhexyl) phthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Butylbenzylphthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Carbazole	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Chrysene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Dibenz[a,h]anthracene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Dibenzofuran	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Diethyl phthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Dimethyl phthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Di-n-butylphthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Di-n-octylphthalate	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Fluoranthene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Fluorene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachlorobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachlorobutadiene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachlorocyclopentadiene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Hexachloroethane	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Indeno(1,2,3-cd)pyrene	SVOA	331	U	331	331	U	331	56	J	333	328	U	328	331	U	331
Isophorone	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Naphthalene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Nitrobenzene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
N-Nitroso-di-n-dipropylamine	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
N-Nitrosodiphenylamine	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Pentachlorophenol	SVOA	1660	U	1660	1660	U	1660	1660	U	1660	1640	U	1640	1660	U	1660
Phenanthrene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Phenol	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331
Pyrene	SVOA	331	U	331	331	U	331	333	U	333	328	U	328	331	U	331

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	OB-14 - J1B4J0			OB-15 - J1B4J1			SPA-4 - J19YJ0			SPA-4 re-sample 1, J1FKM0			Duplicate of J19YJ4 - J19YJ9		
		5/17/10			5/17/10			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	28	U	28	658	UD	658
1,2-Dichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	22	U	22	658	UD	658
1,3-Dichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	12	U	12	658	UD	658
1,4-Dichlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	14	U	14	658	UD	658
2,4,5-Trichlorophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2,4,6-Trichlorophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2,4-Dichlorophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2,4-Dimethylphenol	SVOA	328	U	328	331	U	331	325	U	325	66	U	66	658	UD	658
2,4-Dinitrophenol	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	330	U	330	3290	UD	3290
2,4-Dinitrotoluene	SVOA	328	U	328	331	U	331	325	U	325	66	U	66	658	UD	658
2,6-Dinitrotoluene	SVOA	328	U	328	331	U	331	325	U	325	28	U	28	658	UD	658
2-Chloronaphthalene	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
2-Chlorophenol	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
2-Methylnaphthalene	SVOA	328	U	328	331	U	331	325	U	325	19	U	19	658	UD	658
2-Methylphenol (cresol, o-)	SVOA	328	U	328	331	U	331	325	U	325	13	U	13	658	UD	658
2-Nitroaniline	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	50	U	50	3290	UD	3290
2-Nitrophenol	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
3,3'-Dichlorobenzidine	SVOA	657	U	657	663	U	663	650	U	650	90	U	90	1320	UD	1320
3+4 Methylphenol (cresol, m+p)	SVOA	328	U	328	331	U	331	325	U	325	33	U	33	658	UD	658
3-Nitroaniline	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	73	U	73	3290	UD	3290
4,6-Dinitro-2-methylphenol	SVOA	328	U	328	331	U	331	325	U	325	330	U	330	658	UD	658
4-Bromophenylphenyl ether	SVOA	328	U	328	331	U	331	325	U	325	19	U	19	658	UD	658
4-Chloro-3-methylphenol	SVOA	328	U	328	331	U	331	325	U	325	66	U	66	658	UD	658
4-Chloroaniline	SVOA	328	U	328	331	U	331	325	U	325	82	U	82	658	UD	658
4-Chlorophenylphenyl ether	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
4-Nitroaniline	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	72	U	72	3290	UD	3290
4-Nitrophenol	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	97	U	97	3290	UD	3290
Acenaphthene	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	231	JD	658
Acenaphthylene	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	658	UD	658
Anthracene	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	501	JD	658
Benzo(a)anthracene	SVOA	328	U	328	331	U	331	325	U	325	71	J	20	1450	D	658
Benzo(a)pyrene	SVOA	328	U	328	331	U	331	325	U	325	110	J	20	1310	D	658
Benzo(b)fluoranthene	SVOA	328	U	328	331	U	331	325	U	325	120	JX	26	1190	D	658
Benzo(ghi)perylene	SVOA	328	U	328	331	U	331	325	U	325	41	J	16	906	D	658
Benzo(k)fluoranthene	SVOA	328	U	328	331	U	331	325	U	325	40	UX	40	1240	D	658
Bis(2-chloro-1-methylethyl)ether	SVOA	328	U	328	331	U	331	325	U	325	23	U	23	658	UD	658
Bis(2-Chloroethoxy)methane	SVOA	328	U	328	331	U	331	325	U	325	23	U	23	658	UD	658
Bis(2-chloroethyl) ether	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	658	UD	658
Bis(2-ethylhexyl) phthalate	SVOA	328	U	328	331	U	331	325	U	325	110	JB	46	658	UD	658
Butylbenzylphthalate	SVOA	328	U	328	331	U	331	325	U	325	43	U	43	658	UD	658
Carbazole	SVOA	328	U	328	331	U	331	325	U	325	36	U	36	267	JD	658
Chrysene	SVOA	328	U	328	331	U	331	325	U	325	66	J	27	1440	D	658
Dibenz[a,h]anthracene	SVOA	328	U	328	331	U	331	325	U	325	19	U	19	313	JD	658
Dibenzofuran	SVOA	328	U	328	331	U	331	325	U	325	20	U	20	112	JD	658
Diethyl phthalate	SVOA	328	U	328	331	U	331	325	U	325	26	U	26	658	UD	658
Dimethyl phthalate	SVOA	328	U	328	331	U	331	325	U	325	23	U	23	658	UD	658
Di-n-butylphthalate	SVOA	328	U	328	331	U	331	325	U	325	29	U	29	658	UD	658
Di-n-octylphthalate	SVOA	328	U	328	331	U	331	325	U	325	14	U	14	658	UD	658
Fluoranthene	SVOA	328	U	328	331	U	331	325	U	325	120	J	36	3120	D	658
Fluorene	SVOA	328	U	328	331	U	331	325	U	325	18	U	18	177	JD	658
Hexachlorobenzene	SVOA	328	U	328	331	U	331	325	U	325	29	U	29	658	UD	658
Hexachlorobutadiene	SVOA	328	U	328	331	U	331	325	U	325	10	U	10	658	UD	658
Hexachlorocyclopentadiene	SVOA	328	U	328	331	U	331	325	U	325	50	U	50	658	UD	658
Hexachloroethane	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
Indeno(1,2,3-cd)pyrene	SVOA	328	U	328	331	U	331	325	U	325	83	J	22	805	D	658
Isophorone	SVOA	328	U	328	331	U	331	325	U	325	17	U	17	658	UD	658
Naphthalene	SVOA	328	U	328	331	U	331	325	U	325	31	U	31	658	UD	658
Nitrobenzene	SVOA	328	U	328	331	U	331	325	U	325	22	U	22	658	UD	658
N-Nitroso-di-n-dipropylamine	SVOA	328	U	328	331	U	331	325	U	325	31	U	31	658	UD	658
N-Nitrosodiphenylamine	SVOA	328	U	328	331	U	331	325	U	325	21	U	21	658	UD	658
Pentachlorophenol	SVOA	1640	U	1640	1660	U	1660	1630	U	1630	330	U	330	3290	UD	3290
Phenanthrene	SVOA	328	U	328	331	U	331	325	U	325	44	J	17	2110	D	658
Phenol	SVOA	328	U	328	331	U	331	325	U	325	18	U	18	658	UD	658
Pyrene	SVOA	328	U	328	331	U	331	325	U	325	110	J	12	2190	D	658

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Duplicate of J1FKM0 re-sample 1, J1FKM9 3/17/11			SPA-1 - J19YH7 5/17/10			SPA-1 re-sample 1, J1FKL7 3/17/11			SPA-2 - J19YH8 5/17/10			SPA-2 re-sample 1, J1FKL8 3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	327	U	327	28	U	28	331	U	331	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22	327	U	327	22	U	22	331	U	331	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	327	U	327	12	U	12	331	U	331	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	327	U	327	14	U	14	331	U	331	13	U	13
2,4,5-Trichlorophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2,4,6-Trichlorophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2,4-Dichlorophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2,4-Dimethylphenol	SVOA	67	U	67	327	U	327	66	U	66	331	U	331	63	U	63
2,4-Dinitrophenol	SVOA	340	U	340	1640	U	1640	330	U	330	1650	U	1650	320	U	320
2,4-Dinitrotoluene	SVOA	67	U	67	327	U	327	66	U	66	331	U	331	63	U	63
2,6-Dinitrotoluene	SVOA	28	U	28	327	U	327	28	U	28	331	U	331	27	U	27
2-Chloronaphthalene	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
2-Chlorophenol	SVOA	21	U	21	327	U	327	21	U	21	331	U	331	20	U	20
2-Methylnaphthalene	SVOA	19	U	19	327	U	327	19	U	19	331	U	331	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	327	U	327	13	U	13	331	U	331	12	U	12
2-Nitroaniline	SVOA	50	U	50	1640	U	1640	50	U	50	1650	U	1650	48	U	48
2-Nitrophenol	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
3,3'-Dichlorobenzidine	SVOA	91	U	91	655	U	655	90	U	90	662	U	662	87	U	87
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	327	U	327	33	U	33	331	U	331	32	U	32
3-Nitroaniline	SVOA	74	U	74	1640	U	1640	73	U	73	1650	U	1650	70	U	70
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	327	U	327	330	U	330	331	U	331	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19	327	U	327	19	U	19	331	U	331	18	U	18
4-Chloro-3-methylphenol	SVOA	67	U	67	327	U	327	66	U	66	331	U	331	63	U	63
4-Chloroaniline	SVOA	83	U	83	327	U	327	82	U	82	331	U	331	79	U	79
4-Chlorophenylphenyl ether	SVOA	21	U	21	327	U	327	21	U	21	331	U	331	20	U	20
4-Nitroaniline	SVOA	73	U	73	1640	U	1640	73	U	73	1650	U	1650	70	U	70
4-Nitrophenol	SVOA	98	U	98	1640	U	1640	97	U	97	1650	U	1650	93	U	93
Acenaphthene	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.9	U	9.9
Acenaphthylene	SVOA	17	U	17	327	U	327	17	U	17	331	U	331	16	U	16
Anthracene	SVOA	19	J	17	89.6	J	327	17	U	17	331	U	331	16	U	16
Benzo(a)anthracene	SVOA	130	J	20	435		327	20	U	20	331	U	331	19	U	19
Benzo(a)pyrene	SVOA	150	J	20	400		327	20	U	20	331	U	331	19	U	19
Benzo(b)fluoranthene	SVOA	210	JX	26	369		327	26	U	26	331	U	331	25	U	25
Benzo(ghi)perylene	SVOA	68	J	16	237	J	327	16	U	16	331	U	331	15	U	15
Benzo(k)fluoranthene	SVOA	40	UX	40	382		327	40	U	40	331	U	331	38	U	38
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	327	U	327	23	U	23	331	U	331	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	327	U	327	23	U	23	331	U	331	22	U	22
Bis(2-chloroethyl) ether	SVOA	17	U	17	327	U	327	17	U	17	331	U	331	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	110	JB	46	327	U	327	110	JB	46	273	J	331	110	JB	44
Butylbenzylphthalate	SVOA	43	U	43	327	U	327	43	U	43	331	U	331	41	U	41
Carbazole	SVOA	36	U	36	327	U	327	36	U	36	331	U	331	35	U	35
Chrysene	SVOA	120	J	27	441		327	27	U	27	331	U	331	26	U	26
Dibenz[a,h]anthracene	SVOA	19	U	19	96.2	J	327	19	U	19	331	U	331	18	U	18
Dibenzofuran	SVOA	20	U	20	327	U	327	20	U	20	331	U	331	19	U	19
Diethyl phthalate	SVOA	26	U	26	327	U	327	26	U	26	331	U	331	25	U	25
Dimethyl phthalate	SVOA	23	U	23	327	U	327	23	U	23	331	U	331	22	U	22
Di-n-butylphthalate	SVOA	29	U	29	327	U	327	29	U	29	331	U	331	28	U	28
Di-n-octylphthalate	SVOA	15	U	15	327	U	327	14	U	14	331	U	331	14	U	14
Fluoranthene	SVOA	210	J	36	816		327	36	U	36	331	U	331	35	U	35
Fluorene	SVOA	18	U	18	327	U	327	18	U	18	331	U	331	17	U	17
Hexachlorobenzene	SVOA	29	U	29	327	U	327	29	U	29	331	U	331	28	U	28
Hexachlorobutadiene	SVOA	10	U	10	327	U	327	10	U	10	331	U	331	9.6	U	9.6
Hexachlorocyclopentadiene	SVOA	50	U	50	327	U	327	50	U	50	331	U	331	48	U	48
Hexachloroethane	SVOA	22	U	22	327	U	327	21	U	21	331	U	331	20	U	20
Indeno(1,2,3-cd)pyrene	SVOA	110	J	22	243	J	327	22	U	22	331	U	331	21	U	21
Isophorone	SVOA	17	U	17	327	U	327	17	U	17	331	U	331	16	U	16
Naphthalene	SVOA	31	U	31	327	U	327	31	U	31	331	U	331	30	U	30
Nitrobenzene	SVOA	22	U	22	327	U	327	22	U	22	331	U	331	21	U	21
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	327	U	327	31	U	31	331	U	331	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21	327	U	327	21	U	21	331	U	331	20	U	20
Pentachlorophenol	SVOA	330	U	330	1640	U	1640	330	U	330	1650	U	1650	320	U	320
Phenanthrene	SVOA	62	J	17	318	J	327	17	U	17	331	U	331	16	U	16
Phenol	SVOA	18	U	18	327	U	327	18	U	18	331	U	331	17	U	17
Pyrene	SVOA	190	J	12	637		327	12	U	12	331	U	331	12	U	12

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-3 - J19YH9			SPA-3 re-sample 1, J1FKL9			SPA-5 - J19YJ1			SPA-5 re-sample 1, J1FKM1			SPA-6 - J19YJ2		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	332	U	332	27	U	27	331	U	331	29	U	29	326	U	326
1,2-Dichlorobenzene	SVOA	332	U	332	22	U	22	331	U	331	23	U	23	326	U	326
1,3-Dichlorobenzene	SVOA	332	U	332	12	U	12	331	U	331	12	U	12	326	U	326
1,4-Dichlorobenzene	SVOA	332	U	332	13	U	13	331	U	331	14	U	14	326	U	326
2,4,5-Trichlorophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2,4,6-Trichlorophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2,4-Dichlorophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2,4-Dimethylphenol	SVOA	332	U	332	65	U	65	331	U	331	68	U	68	326	U	326
2,4-Dinitrophenol	SVOA	1660	U	1660	330	U	330	1650	U	1650	340	U	340	1630	U	1630
2,4-Dinitrotoluene	SVOA	332	U	332	65	U	65	331	U	331	68	U	68	326	U	326
2,6-Dinitrotoluene	SVOA	332	U	332	27	U	27	331	U	331	29	U	29	326	U	326
2-Chloronaphthalene	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
2-Chlorophenol	SVOA	332	U	332	21	U	21	331	U	331	21	U	21	326	U	326
2-Methylnaphthalene	SVOA	332	U	332	19	U	19	331	U	331	19	U	19	326	U	326
2-Methylphenol (cresol, o-)	SVOA	332	U	332	13	U	13	331	U	331	13	U	13	326	U	326
2-Nitroaniline	SVOA	1660	U	1660	49	U	49	1650	U	1650	51	U	51	1630	U	1630
2-Nitrophenol	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
3,3'-Dichlorobenzidine	SVOA	664	U	664	88	U	88	662	U	662	92	U	92	651	U	651
3+4 Methylphenol (cresol, m+p)	SVOA	332	U	332	32	U	32	331	U	331	34	U	34	326	U	326
3-Nitroaniline	SVOA	1660	U	1660	71	U	71	1650	U	1650	75	U	75	1630	U	1630
4,6-Dinitro-2-methylphenol	SVOA	332	U	332	320	U	320	331	U	331	340	U	340	326	U	326
4-Bromophenylphenyl ether	SVOA	332	U	332	19	U	19	331	U	331	19	U	19	326	U	326
4-Chloro-3-methylphenol	SVOA	332	U	332	65	U	65	331	U	331	68	U	68	326	U	326
4-Chloroaniline	SVOA	332	U	332	80	U	80	331	U	331	84	U	84	326	U	326
4-Chlorophenylphenyl ether	SVOA	332	U	332	21	U	21	331	U	331	21	U	21	326	U	326
4-Nitroaniline	SVOA	1660	U	1660	71	U	71	1650	U	1650	74	U	74	1630	U	1630
4-Nitrophenol	SVOA	1660	U	1660	95	U	95	1650	U	1650	99	U	99	1630	U	1630
Acenaphthene	SVOA	332	U	332	15	J	10	331	U	331	11	U	11	326	U	326
Acenaphthylene	SVOA	332	U	332	17	U	17	331	U	331	17	U	17	326	U	326
Anthracene	SVOA	332	U	332	31	J	17	331	U	331	17	U	17	326	U	326
Benzo(a)anthracene	SVOA	332	U	332	69	J	20	331	U	331	66	J	20	179	J	326
Benzo(a)pyrene	SVOA	332	U	332	100	J	20	331	U	331	110	J	20	176	J	326
Benzo(b)fluoranthene	SVOA	332	U	332	110	JX	26	331	U	331	120	JX	27	172	J	326
Benzo(ghi)perylene	SVOA	332	U	332	31	J	16	331	U	331	46	J	16	77.4	J	326
Benzo(k)fluoranthene	SVOA	332	U	332	39	UX	39	331	U	331	41	UX	41	180	J	326
Bis(2-chloro-1-methylethyl)ether	SVOA	332	U	332	23	U	23	331	U	331	24	U	24	326	U	326
Bis(2-Chloroethoxy)methane	SVOA	332	U	332	23	U	23	331	U	331	24	U	24	326	U	326
Bis(2-chloroethyl) ether	SVOA	332	U	332	16	U	16	331	U	331	17	U	17	326	U	326
Bis(2-ethylhexyl) phthalate	SVOA	332	U	332	100	JB	45	331	U	331	130	JB	47	326	U	326
Butylbenzylphthalate	SVOA	332	U	332	42	U	42	331	U	331	44	U	44	326	U	326
Carbazole	SVOA	332	U	332	35	U	35	331	U	331	37	U	37	326	U	326
Chrysene	SVOA	332	U	332	69	J	26	331	U	331	63	J	28	194	J	326
Dibenz[a,h]anthracene	SVOA	332	U	332	19	U	19	331	U	331	19	U	19	326	U	326
Dibenzofuran	SVOA	332	U	332	20	U	20	331	U	331	20	U	20	326	U	326
Diethyl phthalate	SVOA	332	U	332	25	U	25	331	U	331	27	U	27	326	U	326
Dimethyl phthalate	SVOA	332	U	332	23	U	23	331	U	331	24	U	24	326	U	326
Di-n-butylphthalate	SVOA	332	U	332	28	U	28	331	U	331	30	U	30	326	U	326
Di-n-octylphthalate	SVOA	332	U	332	14	U	14	331	U	331	15	U	15	326	U	326
Fluoranthene	SVOA	332	U	332	140	J	35	331	U	331	99	J	37	366		326
Fluorene	SVOA	332	U	332	18	U	18	331	U	331	18	U	18	326	U	326
Hexachlorobenzene	SVOA	332	U	332	28	U	28	331	U	331	30	U	30	326	U	326
Hexachlorobutadiene	SVOA	332	U	332	9.8	U	9.8	331	U	331	10	U	10	326	U	326
Hexachlorocyclopentadiene	SVOA	332	U	332	49	U	49	331	U	331	51	U	51	326	U	326
Hexachloroethane	SVOA	332	U	332	21	U	21	331	U	331	22	U	22	326	U	326
Indeno(1,2,3-cd)pyrene	SVOA	332	U	332	75	J	22	331	U	331	91	J	23	83.1	J	326
Isophorone	SVOA	332	U	332	17	U	17	331	U	331	17	U	17	326	U	326
Naphthalene	SVOA	332	U	332	30	U	30	331	U	331	32	U	32	326	U	326
Nitrobenzene	SVOA	332	U	332	22	U	22	331	U	331	23	U	23	326	U	326
N-Nitroso-di-n-dipropylamine	SVOA	332	U	332	30	U	30	331	U	331	32	U	32	326	U	326
N-Nitrosodiphenylamine	SVOA	332	U	332	21	U	21	331	U	331	21	U	21	326	U	326
Pentachlorophenol	SVOA	1660	U	1660	320	U	320	1650	U	1650	340	U	340	1630	U	1630
Phenanthrene	SVOA	332	U	332	110	J	17	331	U	331	33	J	17	171	J	326
Phenol	SVOA	332	U	332	18	U	18	331	U	331	18	U	18	326	U	326
Pyrene	SVOA	332	U	332	120	J	12	331	U	331	92	J	12	309	J	326

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-6 re-sample 1, J1FKM2			SPA-7 - J19YJ3			SPA-7 re-sample 1, J1FKM3			SPA-8 - J19YJ4			SPA-8 re-sample 1, J1FKM4		
		3/17/11			5/17/10			3/17/11			5/17/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	331	U	331	30	U	30	331	U	331	29	U	29
1,2-Dichlorobenzene	SVOA	23	U	23	331	U	331	24	U	24	331	U	331	23	U	23
1,3-Dichlorobenzene	SVOA	13	U	13	331	U	331	13	U	13	331	U	331	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	331	U	331	15	U	15	331	U	331	14	U	14
2,4,5-Trichlorophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2,4,6-Trichlorophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2,4-Dichlorophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2,4-Dimethylphenol	SVOA	70	U	70	331	U	331	71	U	71	331	U	331	68	U	68
2,4-Dinitrophenol	SVOA	350	U	350	1660	U	1660	360	U	360	1660	U	1660	340	U	340
2,4-Dinitrotoluene	SVOA	70	U	70	331	U	331	71	U	71	331	U	331	68	U	68
2,6-Dinitrotoluene	SVOA	30	U	30	331	U	331	30	U	30	331	U	331	29	U	29
2-Chloronaphthalene	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
2-Chlorophenol	SVOA	22	U	22	331	U	331	23	U	23	331	U	331	22	U	22
2-Methylnaphthalene	SVOA	20	U	20	331	U	331	20	U	20	331	U	331	20	U	20
2-Methylphenol (cresol, o-)	SVOA	14	U	14	331	U	331	14	U	14	331	U	331	13	U	13
2-Nitroaniline	SVOA	53	U	53	1660	U	1660	54	U	54	1660	U	1660	52	U	52
2-Nitrophenol	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
3,3'-Dichlorobenzidine	SVOA	95	U	95	663	U	663	97	U	97	663	U	663	93	U	93
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	331	U	331	36	U	36	331	U	331	34	U	34
3-Nitroaniline	SVOA	77	U	77	1660	U	1660	79	U	79	1660	U	1660	75	U	75
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	331	U	331	360	U	360	331	U	331	340	U	340
4-Bromophenylphenyl ether	SVOA	20	U	20	331	U	331	20	U	20	331	U	331	20	U	20
4-Chloro-3-methylphenol	SVOA	70	U	70	331	U	331	71	U	71	331	U	331	68	U	68
4-Chloroaniline	SVOA	87	U	87	331	U	331	88	U	88	331	U	331	84	U	84
4-Chlorophenylphenyl ether	SVOA	22	U	22	331	U	331	23	U	23	331	U	331	22	U	22
4-Nitroaniline	SVOA	77	U	77	1660	U	1660	78	U	78	1660	U	1660	75	U	75
4-Nitrophenol	SVOA	100	U	100	1660	U	1660	100	U	100	1660	U	1660	100	U	100
Acenaphthene	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	11	U	11
Acenaphthylene	SVOA	18	U	18	331	U	331	18	U	18	331	U	331	18	U	18
Anthracene	SVOA	18	U	18	331	U	331	20	J	18	331	U	331	18	U	18
Benzo(a)anthracene	SVOA	29	J	21	70.2	J	331	90	J	22	91.6	J	331	21	U	21
Benzo(a)pyrene	SVOA	85	J	21	66.9	J	331	130	J	22	90.1	J	331	71	J	21
Benzo(b)fluoranthene	SVOA	56	JX	28	62.7	J	331	130	JX	28	88.5	J	331	27	U	27
Benzo(ghi)perylene	SVOA	23	J	17	331	U	331	64	J	17	331	U	331	16	U	16
Benzo(k)fluoranthene	SVOA	42	UX	42	65.8	J	331	43	UX	43	91.5	J	331	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	331	U	331	25	U	25	331	U	331	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	331	U	331	25	U	25	331	U	331	24	U	24
Bis(2-chloroethyl) ether	SVOA	18	U	18	331	U	331	18	U	18	331	U	331	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	130	JB	49	331	U	331	120	JB	49	331	U	331	120	JB	47
Butylbenzylphthalate	SVOA	46	U	46	331	U	331	46	U	46	331	U	331	44	U	44
Carbazole	SVOA	38	U	38	331	U	331	39	U	39	331	U	331	37	U	37
Chrysene	SVOA	29	J	29	77.9	J	331	94	J	29	96.8	J	331	28	U	28
Dibenz[a,h]anthracene	SVOA	20	U	20	331	U	331	20	U	20	331	U	331	20	U	20
Dibenzofuran	SVOA	21	U	21	331	U	331	22	U	22	331	U	331	21	U	21
Diethyl phthalate	SVOA	28	U	28	331	U	331	28	U	28	331	U	331	27	U	27
Dimethyl phthalate	SVOA	24	U	24	331	U	331	25	U	25	331	U	331	24	U	24
Di-n-butylphthalate	SVOA	31	U	31	331	U	331	31	U	31	331	U	331	30	U	30
Di-n-octylphthalate	SVOA	15	U	15	331	U	331	15	U	15	331	U	331	15	U	15
Fluoranthene	SVOA	48	J	38	138	J	331	190	J	39	181	J	331	37	U	37
Fluorene	SVOA	19	U	19	331	U	331	19	U	19	331	U	331	19	U	19
Hexachlorobenzene	SVOA	31	U	31	331	U	331	31	U	31	331	U	331	30	U	30
Hexachlorobutadiene	SVOA	11	U	11	331	U	331	11	U	11	331	U	331	10	U	10
Hexachlorocyclopentadiene	SVOA	53	U	53	331	U	331	54	U	54	331	U	331	52	U	52
Hexachloroethane	SVOA	23	U	23	331	U	331	23	U	23	331	U	331	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	75	J	23	331	U	331	97	J	24	331	U	331	63	J	23
Isophorone	SVOA	18	U	18	331	U	331	18	U	18	331	U	331	18	U	18
Naphthalene	SVOA	33	U	33	331	U	331	33	U	33	331	U	331	32	U	32
Nitrobenzene	SVOA	23	U	23	331	U	331	24	U	24	331	U	331	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	331	U	331	33	U	33	331	U	331	32	U	32
N-Nitrosodiphenylamine	SVOA	22	U	22	331	U	331	23	U	23	331	U	331	22	U	22
Pentachlorophenol	SVOA	350	U	350	1660	U	1660	360	U	360	1660	U	1660	340	U	340
Phenanthrene	SVOA	23	J	18	64.2	J	331	120	J	18	105	J	331	19	J	18
Phenol	SVOA	19	U	19	331	U	331	19	U	19	331	U	331	19	U	19
Pyrene	SVOA	52	J	13	118	J	331	210	J	13	154	J	331	38	J	12

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-9 - J19YJ5			SPA-9 re-sample 1, J1FKM5			SPA-10 - J19YJ6			SPA-10 re-sample 1, J1FKM6			SPA-11 - J19YJ7		
		5/17/10			3/17/11			5/17/10			3/17/11			5/17/10		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	330	U	330	30	U	30	330	U	330	28	U	28	330	U	330
1,2-Dichlorobenzene	SVOA	330	U	330	24	U	24	330	U	330	22	U	22	330	U	330
1,3-Dichlorobenzene	SVOA	330	U	330	13	U	13	330	U	330	12	U	12	330	U	330
1,4-Dichlorobenzene	SVOA	330	U	330	15	U	15	330	U	330	14	U	14	330	U	330
2,4,5-Trichlorophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2,4,6-Trichlorophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2,4-Dichlorophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2,4-Dimethylphenol	SVOA	330	U	330	72	U	72	330	U	330	66	U	66	330	U	330
2,4-Dinitrophenol	SVOA	1650	U	1650	360	U	360	1650	U	1650	330	U	330	1650	U	1650
2,4-Dinitrotoluene	SVOA	330	U	330	72	U	72	330	U	330	66	U	66	330	U	330
2,6-Dinitrotoluene	SVOA	330	U	330	30	U	30	330	U	330	28	U	28	330	U	330
2-Chloronaphthalene	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
2-Chlorophenol	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
2-Methylnaphthalene	SVOA	330	U	330	21	U	21	330	U	330	19	U	19	330	U	330
2-Methylphenol (cresol, o-)	SVOA	330	U	330	14	U	14	330	U	330	13	U	13	330	U	330
2-Nitroaniline	SVOA	1650	U	1650	54	U	54	1650	U	1650	50	U	50	1650	U	1650
2-Nitrophenol	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
3,3'-Dichlorobenzidine	SVOA	661	U	661	98	U	98	660	U	660	90	U	90	660	U	660
3+4 Methylphenol (cresol, m+p)	SVOA	330	U	330	36	U	36	330	U	330	33	U	33	330	U	330
3-Nitroaniline	SVOA	1650	U	1650	79	U	79	1650	U	1650	73	U	73	1650	U	1650
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	360	U	360	330	U	330	330	U	330	330	U	330
4-Bromophenylphenyl ether	SVOA	330	U	330	21	U	21	330	U	330	19	U	19	330	U	330
4-Chloro-3-methylphenol	SVOA	330	U	330	72	U	72	330	U	330	66	U	66	330	U	330
4-Chloroaniline	SVOA	330	U	330	89	U	89	330	U	330	82	U	82	330	U	330
4-Chlorophenylphenyl ether	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
4-Nitroaniline	SVOA	1650	U	1650	79	U	79	1650	U	1650	73	U	73	1650	U	1650
4-Nitrophenol	SVOA	1650	U	1650	110	U	110	1650	U	1650	98	U	98	1650	U	1650
Acenaphthene	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
Acenaphthylene	SVOA	330	U	330	18	U	18	330	U	330	17	U	17	330	U	330
Anthracene	SVOA	59.8	J	330	18	U	18	330	U	330	17	U	17	330	U	330
Benzo(a)anthracene	SVOA	283	J	330	22	U	22	84.4	J	330	20	U	20	121	J	330
Benzo(a)pyrene	SVOA	268	J	330	69	J	22	96.3	J	330	20	U	20	123	J	330
Benzo(b)fluoranthene	SVOA	260	J	330	28	U	28	97.3	J	330	26	U	26	119	J	330
Benzo(ghi)perylene	SVOA	115	J	330	17	U	17	330	U	330	16	U	16	54.7	J	330
Benzo(k)fluoranthene	SVOA	269	J	330	43	U	43	93.6	J	330	40	U	40	117	J	330
Bis(2-chloro-1-methylethyl)ether	SVOA	330	U	330	25	U	25	330	U	330	23	U	23	330	U	330
Bis(2-Chloroethoxy)methane	SVOA	330	U	330	25	U	25	330	U	330	23	U	23	330	U	330
Bis(2-chloroethyl) ether	SVOA	330	U	330	18	U	18	330	U	330	17	U	17	330	U	330
Bis(2-ethylhexyl) phthalate	SVOA	330	U	330	120	JB	50	330	U	330	110	JB	46	330	U	330
Butylbenzylphthalate	SVOA	330	U	330	47	U	47	330	U	330	43	U	43	330	U	330
Carbazole	SVOA	330	U	330	39	U	39	330	U	330	36	U	36	330	U	330
Chrysene	SVOA	287	J	330	29	U	29	101	J	330	27	U	27	128	J	330
Dibenz[a,h]anthracene	SVOA	66.2	J	330	21	U	21	330	U	330	19	U	19	330	U	330
Dibenzofuran	SVOA	330	U	330	22	U	22	330	U	330	20	U	20	330	U	330
Diethyl phthalate	SVOA	330	U	330	28	U	28	330	U	330	26	U	26	330	U	330
Dimethyl phthalate	SVOA	330	U	330	25	U	25	330	U	330	23	U	23	330	U	330
Di-n-butylphthalate	SVOA	330	U	330	32	U	32	330	U	330	29	U	29	330	U	330
Di-n-octylphthalate	SVOA	330	U	330	16	U	16	330	U	330	14	U	14	330	U	330
Fluoranthene	SVOA	564		330	39	U	39	179	J	330	36	U	36	238	J	330
Fluorene	SVOA	330	U	330	20	U	20	330	U	330	18	U	18	330	U	330
Hexachlorobenzene	SVOA	330	U	330	32	U	32	330	U	330	29	U	29	330	U	330
Hexachlorobutadiene	SVOA	330	U	330	11	U	11	330	U	330	10	U	10	330	U	330
Hexachlorocyclopentadiene	SVOA	330	U	330	54	U	54	330	U	330	50	U	50	330	U	330
Hexachloroethane	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
Indeno(1,2,3-cd)pyrene	SVOA	129	J	330	64	J	24	330	U	330	22	U	22	59.4	J	330
Isophorone	SVOA	330	U	330	18	U	18	330	U	330	17	U	17	330	U	330
Naphthalene	SVOA	330	U	330	34	U	34	330	U	330	31	U	31	330	U	330
Nitrobenzene	SVOA	330	U	330	24	U	24	330	U	330	22	U	22	330	U	330
N-Nitroso-di-n-dipropylamine	SVOA	330	U	330	34	U	34	330	U	330	31	U	31	330	U	330
N-Nitrosodiphenylamine	SVOA	330	U	330	23	U	23	330	U	330	21	U	21	330	U	330
Pentachlorophenol	SVOA	1650	U	1650	360	U	360	1650	U	1650	330	U	330	1650	U	1650
Phenanthrene	SVOA	240	J	330	18	U	18	73.4	J	330	17	U	17	104	J	330
Phenol	SVOA	330	U	330	20	U	20	330	U	330	18	U	18	330	U	330
Pyrene	SVOA	421		330	18	J	13	151	J	330	12	U	12	194	J	330

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	SPA-11 re-sample 1, J1FKM7			SPA-12 - J19YJ8			SPA-12 re-sample 1, J1FKM8			Equipment Blank - J19YK0			Equipment Blank re-sample 1, J1FKN0		
		3/17/11			5/17/10			3/17/11			5/17/10			3/17/11		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	332	U	332	29	U	29	334	U	334	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	332	U	332	23	U	23	334	U	334	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	332	U	332	12	U	12	334	U	334	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	332	U	332	14	U	14	334	U	334	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2,4-Dichlorophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2,4-Dimethylphenol	SVOA	65	U	65	332	U	332	68	U	68	334	U	334	66	U	66
2,4-Dinitrophenol	SVOA	330	U	330	1660	U	1660	340	U	340	1670	U	1670	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65	332	U	332	68	U	68	334	U	334	66	U	66
2,6-Dinitrotoluene	SVOA	28	U	28	332	U	332	29	U	29	334	U	334	28	U	28
2-Chloronaphthalene	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
2-Chlorophenol	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	332	U	332	19	U	19	334	U	334	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	332	U	332	13	U	13	334	U	334	13	U	13
2-Nitroaniline	SVOA	49	U	49	1660	U	1660	51	U	51	1670	U	1670	50	U	50
2-Nitrophenol	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
3,3'-Dichlorobenzidine	SVOA	89	U	89	663	U	663	92	U	92	668	U	668	90	U	90
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	332	U	332	34	U	34	334	U	334	33	U	33
3-Nitroaniline	SVOA	72	U	72	1660	U	1660	75	U	75	1670	U	1670	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	332	U	332	340	U	340	334	U	334	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	332	U	332	19	U	19	334	U	334	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	332	U	332	68	U	68	334	U	334	66	U	66
4-Chloroaniline	SVOA	81	U	81	332	U	332	84	U	84	334	U	334	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
4-Nitroaniline	SVOA	71	U	71	1660	U	1660	74	U	74	1670	U	1670	72	U	72
4-Nitrophenol	SVOA	95	U	95	1660	U	1660	99	U	99	1670	U	1670	96	U	96
Acenaphthene	SVOA	10	U	10	332	U	332	11	U	11	334	U	334	10	U	10
Acenaphthylene	SVOA	17	U	17	332	U	332	17	U	17	334	U	334	17	U	17
Anthracene	SVOA	17	U	17	332	U	332	17	U	17	334	U	334	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	117	J	332	21	U	21	334	U	334	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	108	J	332	70	J	21	334	U	334	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	102	J	332	27	JX	27	334	U	334	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	117	J	332	16	U	16	334	U	334	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	90.8	J	332	41	UX	41	334	U	334	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	332	U	332	24	U	24	334	U	334	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	332	U	332	24	U	24	334	U	334	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	332	U	332	17	U	17	334	U	334	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	110	JB	45	332	U	332	130	JB	47	334	U	334	120	JB	46
Butylbenzylphthalate	SVOA	42	U	42	332	U	332	44	U	44	334	U	334	43	U	43
Carbazole	SVOA	35	U	35	332	U	332	37	U	37	334	U	334	36	U	36
Chrysene	SVOA	27	U	27	117	J	332	28	U	28	334	U	334	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	332	U	332	19	U	19	334	U	334	19	U	19
Dibenzofuran	SVOA	20	U	20	332	U	332	21	U	21	334	U	334	20	U	20
Diethyl phthalate	SVOA	26	U	26	332	U	332	27	U	27	116	J	334	26	U	26
Dimethyl phthalate	SVOA	23	U	23	332	U	332	24	U	24	334	U	334	23	U	23
Di-n-butylphthalate	SVOA	29	U	29	332	U	332	30	U	30	58.7	J	334	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	332	U	332	15	U	15	334	U	334	14	U	14
Fluoranthene	SVOA	35	U	35	223	J	332	37	U	37	334	U	334	36	U	36
Fluorene	SVOA	18	U	18	332	U	332	18	U	18	334	U	334	18	U	18
Hexachlorobenzene	SVOA	29	U	29	332	U	332	30	U	30	334	U	334	29	U	29
Hexachlorobutadiene	SVOA	9.8	U	9.8	332	U	332	10	U	10	334	U	334	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	49	U	49	332	U	332	51	U	51	334	U	334	50	U	50
Hexachloroethane	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	90.8	J	332	64	J	23	334	U	334	22	U	22
Isophorone	SVOA	17	U	17	332	U	332	17	U	17	334	U	334	17	U	17
Naphthalene	SVOA	31	U	31	332	U	332	32	U	32	334	U	334	31	U	31
Nitrobenzene	SVOA	22	U	22	332	U	332	23	U	23	334	U	334	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	332	U	332	32	U	32	334	U	334	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	332	U	332	22	U	22	334	U	334	21	U	21
Pentachlorophenol	SVOA	320	U	320	1660	U	1660	340	U	340	1670	U	1670	330	U	330
Phenanthrene	SVOA	17	U	17	111	J	332	17	U	17	334	U	334	17	U	17
Phenol	SVOA	18	U	18	332	U	332	18	U	18	334	U	334	18	U	18
Pyrene	SVOA	12	U	12	172	J	332	28	J	12	334	U	334	12	U	12

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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

CONSTITUENT	CLASS	Equipment Blank re-sample 2, J1HH87 4/13/11		
		ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8
2,4-Dichlorophenol	SVOA	9.8	U	9.8
2,4-Dimethylphenol	SVOA	65	U	65
2,4-Dinitrophenol	SVOA	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65
2,6-Dinitrotoluene	SVOA	27	U	27
2-Chloronaphthalene	SVOA	9.8	U	9.8
2-Chlorophenol	SVOA	21	U	21
2-Methylnaphthalene	SVOA	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13
2-Nitroaniline	SVOA	49	U	49
2-Nitrophenol	SVOA	9.8	U	9.8
3,3'-Dichlorobenzidine	SVOA	88	U	88
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32
3-Nitroaniline	SVOA	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65
4-Chloroaniline	SVOA	80	U	80
4-Chlorophenylphenyl ether	SVOA	21	U	21
4-Nitroaniline	SVOA	71	U	71
4-Nitrophenol	SVOA	95	U	95
Acenaphthene	SVOA	10	U	10
Acenaphthylene	SVOA	17	U	17
Anthracene	SVOA	17	U	17
Benzo(a)anthracene	SVOA	20	U	20
Benzo(a)pyrene	SVOA	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	71	JB	45
Butylbenzylphthalate	SVOA	42	U	42
Carbazole	SVOA	35	U	35
Chrysene	SVOA	26	U	26
Dibenz[a,h]anthracene	SVOA	19	U	19
Dibenzofuran	SVOA	20	U	20
Diethyl phthalate	SVOA	25	U	25
Dimethyl phthalate	SVOA	23	U	23
Di-n-butylphthalate	SVOA	28	U	28
Di-n-octylphthalate	SVOA	14	U	14
Fluoranthene	SVOA	35	U	35
Fluorene	SVOA	18	U	18
Hexachlorobenzene	SVOA	28	U	28
Hexachlorobutadiene	SVOA	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	49	U	49
Hexachloroethane	SVOA	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22
Isophorone	SVOA	17	U	17
Naphthalene	SVOA	30	U	30
Nitrobenzene	SVOA	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21
Pentachlorophenol	SVOA	320	U	320
Phenanthrene	SVOA	17	U	17
Phenol	SVOA	18	U	18
Pyrene	SVOA	12	U	12

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Checked	T. E. Queen	Date	5/17/11
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Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Bromide			Chloride			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in Nitrite [b]		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-2	J19YB9	5/18/10	2.8	U	2.8	2.8	U	2.8	0.7	B	2.8	0.59	JB	0.63	0.85	UR	0.85
Duplicate of J19YB9	J19YD0	5/18/10	2.5	U	2.5	2.5	U	2.5	0.8	B	2.5	0.84		0.56	0.76	U	0.76
SZ-1	J19YB8	5/18/10	2.6	U	2.6	2.6	U	2.6	0.5	B	2.6	0.84	J	0.59	0.79	UR	0.79
SZ-3	J19YC0	5/18/10	2.2	U	2.2	2.2	U	2.2	0.7	B	2.2	0.18	JB	0.50	0.67	UR	0.67
SZ-4	J19YC1	5/18/10	2.6	U	2.6	2.6	U	2.6	0.8	B	2.6	1.06	J	0.59	0.79	UR	0.79
SZ-5	J19YC2	5/18/10	2.5	U	2.5	2.5	U	2.5	0.4	B	2.5	1.81	J	0.56	0.76	UR	0.76
SZ-6	J19YC3	5/18/10	2.6	U	2.6	2.6	U	2.6	0.4	B	2.6	1.94	J	0.59	0.79	UR	0.79
SZ-7	J19YC4	5/18/10	2.5	U	2.5	2.5	U	2.5	0.9	B	2.5	0.75	J	0.56	0.76	UR	0.76
SZ-8	J19YC5	5/18/10	2.5	U	2.5	2.5	U	2.5	0.9	B	2.5	3.37	J	0.56	0.76	UR	0.76
SZ-9	J19YC6	5/18/10	2.5	U	2.5	2.5	U	2.5	1.2	B	2.5	2.64	J	0.56	0.76	UR	0.76
SZ-9 re-sample 1	J1FKL4	3/16/11	0.41	U	0.41	2.1	B	2.1	1.5	B	0.88	1.1	B	0.34	0.36	U	0.36
SZ-10	J19YC7	5/18/10	2.4	U	2.4	2.4	U	2.4	0.5	B	2.4	2.08	J	0.54	0.73	UR	0.73
SZ-11	J19YC8	5/18/10	2.5	U	2.5	2.5	U	2.5	1.3	B	2.5	0.99		0.56	0.76	U	0.76
SZ-11 re-sample 1	J1FKL5	3/16/11	0.38	U	0.38	2.0	U	2.0	0.81	U	0.81	0.4	B	0.31	0.33	U	0.33
SZ-12	J19YC9	5/18/10	2.3	U	2.3	2.3	U	2.3	2.3	U	2.3	0.77		0.52	0.70	U	0.70
DZ-1	J19YD1	5/18/10	2.3	U	2.3	2.3	U	2.3	0.9	B	2.3	2.78	J	0.52	0.70	UR	0.70
Duplicate of J19YD1	J19YF3	5/18/10	2.4	U	2.4	2.4	U	2.4	1.2	B	2.4	2.64		0.54	0.73	U	0.73
DZ-2	J19YD2	5/18/10	2.2	U	2.2	2.2	U	2.2	0.6	B	2.2	1.02	J	0.50	0.67	UR	0.67
DZ-3	J19YD3	5/18/10	2.4	U	2.4	17.6		2.4	0.7	B	2.4	55.8	JD	2.76	0.40	JB	0.73
DZ-4	J19YD4	5/18/10	2.6	U	2.6	5.1		2.6	0.9	B	2.6	26.7	JD	1.20	0.79	UR	0.79
DZ-5	J19YD5	5/18/10	2.5	U	2.5	2.5	U	2.5	1.7	B	2.5	2.26	J	0.56	0.76	UR	0.76
DZ-6	J19YD6	5/18/10	2.4	U	2.4	2.4	U	2.4	1.0	B	2.4	7.59	J	0.54	0.73	UR	0.73
DZ-7	J19YD7	5/18/10	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	5.38	J	0.59	0.79	UR	0.79
DZ-8	J19YD8	5/18/10	2.5	U	2.5	2.5	U	2.5	0.6	B	2.5	1.13	J	0.56	0.76	UR	0.76
DZ-9	J19YD9	5/18/10	2.4	U	2.4	2.4	U	2.4	0.3	B	2.4	0.79	J	0.54	0.73	UR	0.73
DZ-10	J19YF0	5/18/10	2.5	U	2.5	2.5	U	2.5	0.4	B	2.5	3.19	J	0.56	0.76	UR	0.76
DZ-11	J19YF1	5/18/10	2.5	U	2.5	2.5	U	2.5	1.1	B	2.5	4.02		0.56	0.76	U	0.76
DZ-12	J19YF2	5/18/10	2.3	U	2.3	2.9		2.3	1.1	B	2.3	5.11		0.52	0.70	U	0.70

Attachment	1	Sheet No.	73 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Nitrogen in Nitrite and Nitrate			Phosphorous in phosphate [b]			Sulfate			TPH - diesel range			TPH - motor oil (high boiling)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SZ-2	J19YB9	5/18/10	0.49		0.22	1.3	J	0.9	2.6	B	2.8	3830	U	3830	11500	UJ	11500
Duplicate of J19YB9	J19YD0	5/18/10	0.62		0.19	4.2		2.5	3.2		2.5	3410	U	3410	10200	U	10200
SZ-1	J19YB8	5/18/10	1.4		0.22	1.9	JB	2.6	3.2		2.6	3490	U	3490	10500	UJ	10500
SZ-3	J19YC0	5/18/10	0.15	B	0.19	9.8	J	2.2	1.9	B	2.2	3310	U	3310	27600	J	9940
SZ-4	J19YC1	5/18/10	0.69		0.22	2.3	JB	2.6	4.6		2.6	3430	U	3430	4760	J	10300
SZ-5	J19YC2	5/18/10	1.17		0.21	3.5	J	2.5	5.4		2.5	3530	U	3530	10600	UJ	10600
SZ-6	J19YC3	5/18/10	1.03		0.22	7.5	J	2.6	10.2		2.6	3350	U	3350	4330	J	10000
SZ-7	J19YC4	5/18/10	0.67		0.20	2.4	JB	2.5	6.2		2.5	3480	U	3480	4900	J	10400
SZ-8	J19YC5	5/18/10	2.43		0.20	6.8	J	2.5	14.3		2.5	3440	U	3440	3850	J	10300
SZ-9	J19YC6	5/18/10	1.82		0.22	3.2	J	2.5	5.7		2.5	3410	U	3410	29900	J	10200
SZ-9 re-sample 1	J1FKL4	3/16/11	0.53	BMN	0.38	1.3	U	1.3	5.8		1.8	2600	J	720			
SZ-10	J19YC7	5/18/10	1.68		0.22	2.8	J	2.4	9.3		2.4	3410	U	3410	4620	J	10200
SZ-11	J19YC8	5/18/10	0.68		0.21	2.1	B	2.5	3.9		2.5	3440	U	3440	6290	J	10300
SZ-11 re-sample 1	J1FKL5	3/16/11	0.37	U	0.37	2.5	BC	1.2	2.1	B	1.7	700	U	700			
SZ-12	J19YC9	5/18/10	0.52		0.19	2.3	U	2.3	2.6		2.3	3420	U	3420	10200	U	10200
DZ-1	J19YD1	5/18/10	1.7		0.21	2.5	J	2.3	7.8		2.3	3400	U	3400	5670	J	10200
Duplicate of J19YD1	J19YF3	5/18/10	1.62		0.22	3.2		2.4	8.4		2.4	3450	U	3450	3480	J	10400
DZ-2	J19YD2	5/18/10	0.66		0.22	1.0	JB	2.2	4.9		2.2	3470	U	3470	10400	UJ	10400
DZ-3	J19YD3	5/18/10	43.4	D	2.12	1.0	JB	2.4	160	JD	12.2	3540	U	3540	10600	UJ	10600
DZ-4	J19YD4	5/18/10	22.7	D	1.03	1.9	JB	2.6	101		2.6	3440	U	3440	10300	UJ	10300
DZ-5	J19YD5	5/18/10	1.4		0.22	4.9	J	2.5	8.1		2.5	3450	U	3450	9290	J	10400
DZ-6	J19YD6	5/18/10	5.36		0.22	2.5	J	2.4	17.6		2.4	3500	U	3500	10500	UJ	10500
DZ-7	J19YD7	5/18/10	5.67		0.23	2.3	JB	2.6	19.2		2.6	3490	U	3490	127000	J	10500
DZ-8	J19YD8	5/18/10	0.79		0.23	2.3	JB	2.5	10.3		2.5	3440	U	3440	4230	J	10300
DZ-9	J19YD9	5/18/10	0.63		0.21	1.7	JB	2.4	5.8		2.4	3460	U	3460	18700	J	10400
DZ-10	J19YF0	5/18/10	2.08		0.21	3.5	J	2.5	11.3		2.5	3460	U	3460	6750	J	10400
DZ-11	J19YF1	5/18/10	2.94		0.22	4.0		2.5	18.6		2.5	3510	U	3510	6760	J	10500
DZ-12	J19YF2	5/18/10	4.37		0.20	2.2	B	2.3	25.3		2.3	3370	U	3370	8670	J	10100

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Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	TPH diesel range EXT			Percent Solids			pH Measurement		
			ug/kg	Q	PQL	%	Q	PQL	pH unit	Q	PQL
SZ-2	J19YB9	5/18/10				86.1		0.1			
Duplicate of J19YB9	J19YD0	5/18/10				97.2		0.1			
SZ-1	J19YB8	5/18/10				94.9		0.1			
SZ-3	J19YC0	5/18/10				99.0		0.1			
SZ-4	J19YC1	5/18/10				95.6		0.1			
SZ-5	J19YC2	5/18/10				94.5		0.1			
SZ-6	J19YC3	5/18/10				96.4		0.1			
SZ-7	J19YC4	5/18/10				95.3		0.1			
SZ-8	J19YC5	5/18/10				96.2		0.1			
SZ-9	J19YC6	5/18/10				95.0		0.1			
SZ-9 re-sample 1	J1FKL4	3/16/11	8100		1100				9.34		0.01
SZ-10	J19YC7	5/18/10				97.0		0.1			
SZ-11	J19YC8	5/18/10				96.4		0.1			
SZ-11 re-sample 1	J1FKL5	3/16/11	1200	J	1000				9.44		0.01
SZ-12	J19YC9	5/18/10				97.0		0.1			
DZ-1	J19YD1	5/18/10				95.6		0.1			
Duplicate of J19YD1	J19YF3	5/18/10				96.1		0.1			
DZ-2	J19YD2	5/18/10				94.9		0.1			
DZ-3	J19YD3	5/18/10				93.5		0.1			
DZ-4	J19YD4	5/18/10				94.5		0.1			
DZ-5	J19YD5	5/18/10				94.7		0.1			
DZ-6	J19YD6	5/18/10				94.8		0.1			
DZ-7	J19YD7	5/18/10				94.0		0.1			
DZ-8	J19YD8	5/18/10				94.0		0.1			
DZ-9	J19YD9	5/18/10				95.7		0.1			
DZ-10	J19YF0	5/18/10				95.4		0.1			
DZ-11	J19YF1	5/18/10				94.3		0.1			
DZ-12	J19YF2	5/18/10				97.2		0.1			

Attachment	1	Sheet No.	75 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Bromide			Chloride			Fluoride			Nitrogen in Nitrate [b]			Nitrogen in Nitrite [b]		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
OB-5	J19YF8	5/13/10	2.5	U	2.5	2.5	U	2.5	0.8	B	2.5	0.70		0.56	0.76	U	0.76
Duplicate of J19YF8	J19YH6	5/13/10	2.5	U	2.5	2.5	U	2.5	0.5	B	2.5	0.81		0.56	0.76	U	0.76
OB-1	J19YF4	5/13/10	2.5	U	2.5	20.6		2.5	0.7	B	2.5	0.56	U	0.56	0.76	U	0.76
OB-2	J19YF5	5/13/10	2.3	U	2.3	2.3	U	2.3	0.7	B	2.3	0.52	U	0.52	0.70	U	0.70
OB-3	J19YF6	5/13/10	2.4	U	2.4	2.4	U	2.4	0.7	B	2.4	1.29		0.54	0.73	U	0.73
OB-4	J19YF7	5/13/10	2.2	U	2.2	3.6		2.2	0.6	B	2.2	0.52		0.50	0.67	U	0.67
OB-6	J19YF9	5/13/10	2.3	U	2.3	2.3	U	2.3	0.8	B	2.3	1.60		0.52	0.70	U	0.70
OB-7	J19YH0	5/13/10	2.5	U	2.5	6.9		2.5	0.8	B	2.5	0.56	U	0.56	0.76	U	0.76
OB-8	J19YH1	5/13/10	2.3	U	2.3	2.3	U	2.3	0.9	B	2.3	1.31		0.52	0.70	U	0.70
OB-8 re-sample 1	J1FKL6	3/17/11	0.41	U	0.41	2.8	B	2.1	1.1	B	0.88	0.96	B	0.33	0.36	U	0.36
OB-9	J19YH2	5/13/10	2.4	U	2.4	2.4	U	2.4	0.7	B	2.4	0.52	B	0.54	0.73	U	0.73
OB-10	J19YH3	5/13/10	2.4	U	2.4	2.4	U	2.4	0.6	B	2.4	2.51		0.54	0.73	U	0.73
OB-11	J19YH4	5/13/10	2.5	U	2.5	2.5	U	2.5	1.0	B	2.5	0.90		0.56	0.76	U	0.76
OB-12	J19YH5	5/13/10	2.4	U	2.4	2.4	U	2.4	0.7	B	2.4	0.86		0.54	0.73	U	0.73
OB-13	J1B4H9	5/17/10	2.3	U	2.3	2.3	U	2.3	0.5	B	2.3	5.08		0.52	0.70	U	0.70
OB-14	J1B4J0	5/17/10	2.3	U	2.3	2.3	U	2.3	0.7	B	2.3	3.10		0.52	0.70	U	0.70
OB-15	J1B4J1	5/17/10	2.2	U	2.2	2.2	U	2.2	0.3	B	2.2	3.23		0.50	0.67	U	0.67
SPA-4	J19YJ0	5/17/10	2.3	U	2.3	2.3	U	2.3	1.1	B	2.3	0.25	B	0.52	0.70	U	0.70
SPA-4 re-sample 1	J1FKM0	3/17/11	0.38	U	0.38	1.9	U	1.9	0.81	U	0.81	0.43	B	0.31	0.33	U	0.33
Duplicate of J1FKM0	J1FKM9	3/17/11	0.40	U	0.40	2.0	U	2.0	0.84	U	0.84	0.41	B	0.32	0.34	U	0.34
SPA-1	J19YH7	5/17/10	2.4	U	2.4	2.4	U	2.4	0.6	B	2.4	0.77		0.54	0.73	U	0.73
SPA-1 re-sample 1	J1FKL7	3/17/11	0.39	U	0.39	2.0	U	2.0	0.83	U	0.83	0.35	B	0.32	0.34	U	0.34
SPA-2	J19YH8	5/17/10	2.3	U	2.3	2.3	U	2.3	0.9	B	2.3	0.52	U	0.52	0.70	U	0.70
SPA-2 re-sample 1	J1FKL8	3/17/11	0.39	U	0.39	2.0	U	2.0	0.82	U	0.82	0.36	B	0.31	0.34	U	0.34
SPA-3	J19YH9	5/17/10	2.5	U	2.5	2.5	U	2.5	1.0	B	2.5	0.56	U	0.56	0.76	U	0.76
SPA-3 re-sample 1	J1FKL9	3/17/11	0.40	U	0.40	2.0	U	2.0	0.85	U	0.85	0.36	B	0.32	0.35	U	0.35
SPA-5	J19YJ1	5/17/10	2.3	U	2.3	2.3	U	2.3	0.5	B	2.3	0.52	U	0.52	0.70	U	0.70
SPA-5 re-sample 1	J1FKM1	3/17/11	0.40	U	0.40	9.5		2.0	0.86	U	0.86	40.1		0.33	0.35	U	0.35
SPA-6	J19YJ2	5/17/10	2.4	U	2.4	2.5		2.4	0.8	B	2.4	0.50	B	0.54	0.73	U	0.73
SPA-6 re-sample 1	J1FKM2	3/17/11	0.42	U	0.42	6.4		2.1	0.95	B	0.89	44.8		0.34	0.36	U	0.36
SPA-7	J19YJ3	5/17/10	2.2	U	2.2	2.2	U	2.2	0.6	B	2.2	0.29	B	0.50	0.67	U	0.67
SPA-7 re-sample 1	J1FKM3	3/17/11	0.39	U	0.39	2.0	U	2.0	1.1	B	0.83	0.61	B	0.32	0.34	U	0.34
SPA-8	J19YJ4	5/17/10	2.4	U	2.4	2.4	U	2.4	0.8	B	2.4	0.38	B	0.54	0.73	U	0.73
SPA-8 re-sample 1	J1FKM4	3/17/11	0.41	U	0.41	2.1	U	2.1	1.8	B	0.87	0.94	B	0.33	0.36	U	0.36
SPA-9	J19YJ5	5/17/10	2.4	U	2.4	2.4	U	2.4	0.8	B	2.4	1.27		0.54	0.73	U	0.73
SPA-9 re-sample 1	J1FKM5	3/17/11	0.43	U	0.43	2.2	U	2.2	0.96	B	0.91	0.55	B	0.35	0.37	U	0.37
SPA-10	J19YJ6	5/17/10	2.4	U	2.4	2.4	U	2.4	0.8	B	2.4	0.20	B	0.54	0.73	U	0.73
SPA-10 re-sample 1	J1FKM6	3/17/11	0.39	U	0.39	2.0	U	2.0	0.88	B	0.82	0.41	B	0.31	0.34	U	0.34
SPA-11	J19YJ7	5/17/10	2.4	U	2.4	2.4	U	2.4	0.6	B	2.4	4.38		0.54	0.73	U	0.73
SPA-11 re-sample 1	J1FKM7	3/17/11	0.39	U	0.39	5.0	B	2.0	1.1	B	0.84	1.1	B	0.32	0.34	U	0.34
SPA-12	J19YJ8	5/17/10	2.4	U	2.4	5.6		2.4	0.8	B	2.4	1.22		0.54	0.73	U	0.73
SPA-12 re-sample 1	J1FKM8	3/17/11	0.40	U	0.40	2.0	U	2.0	0.97	B	0.85	0.76	B	0.32	0.35	U	0.35
Duplicate of J19YJ4	J19YJ9	5/17/10	2.2	U	2.2	2.2	U	2.2	0.8	B	2.2	0.29	B	0.50	0.67	U	0.67
Equipment Blank	J19YK0	5/17/10															

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Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Nitrogen in Nitrite and Nitrate			Phosphorous in phosphate [b]			Sulfate			TPH - diesel range			TPH - motor oil (high boiling)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
OB-5	J19YF8	5/13/10	0.66		0.20	2.5	U	2.5	5.6		2.5	3360	U	3360	10100	U	10100
Duplicate of J19YF8	J19YH6	5/13/10	0.75		0.20	1.1	B	2.5	6.2		2.5	3350	U	3350	10000	U	10000
OB-1	J19YF4	5/13/10	0.56		0.20	0.9	B	2.5	2.9		2.5	3350	U	3350	10100	U	10100
OB-2	J19YF5	5/13/10	0.34		0.19	1.0	B	2.3	6.4		2.3	3330	U	3330	9980	U	9980
OB-3	J19YF6	5/13/10	1.41		0.19	1.9	B	2.4	6.6		2.4	3340	U	3340	10000	U	10000
OB-4	J19YF7	5/13/10	0.55		0.20	0.9	B	2.2	4.3		2.2	3360	U	3360	10100	U	10100
OB-6	J19YF9	5/13/10	1.25		0.21	3.4		2.3	14.2		2.3	3330	U	3330	5970	J	10000
OB-7	J19YH0	5/13/10	1.3		0.18	2.2	B	2.5	8.8		2.5	3300	U	3300	9900	U	9900
OB-8	J19YH1	5/13/10	1.28		0.19	2.6		2.3	6.7		2.3	4770		3360	8510	J	10100
OB-8 re-sample 1	J1FKL6	3/17/11	0.79	B	0.38	1.3	U	1.3	6.9		1.8	3200	J	720			
OB-9	J19YH2	5/13/10	0.66		0.19	2.4	U	2.4	3.0		2.4	3340	U	3340	10000	U	10000
OB-10	J19YH3	5/13/10	2.49		0.19	1.3	B	2.4	7.7		2.4	3340	U	3340	10000	U	10000
OB-11	J19YH4	5/13/10	0.99		0.18	3.9		2.5	7.4		2.5	3340	U	3340	15000		10000
OB-12	J19YH5	5/13/10	0.95		0.22	2.4		2.4	3.8		2.4	3340	U	3340	10000	U	10000
OB-13	J1B4H9	5/17/10	4.61		0.20	4.4		2.3	6.4		2.3	3360	U	3360	11500		10100
OB-14	J1B4J0	5/17/10	3.01		0.20	4.3		2.3	5.4		2.3	3310	U	3310	6810	J	9930
OB-15	J1B4J1	5/17/10	2.85		0.19	2.7		2.2	8.0		2.2	3340	U	3340	8950	J	10000
SPA-4	J19YJ0	5/17/10	0.11		0.20	7.2		2.3	3.3		2.3	3300	U	3300	8660	J	9920
SPA-4 re-sample 1	J1FKM0	3/17/11	0.36	U	0.36	1.2	U	1.2	1.7	B	1.7	6900		690			
Duplicate of J1FKM0	J1FKM9	3/17/11	0.37	U	0.37	1.3	U	1.3	1.9	B	1.8	2200	J	690			
SPA-1	J19YH7	5/17/10	1.04		0.20	1.4	B	2.4	2.7		2.4	3300	U	3300	184000		9910
SPA-1 re-sample 1	J1FKL7	3/17/11	0.35	U	0.35	2.5	B	1.2	2.1	B	1.7	690	U	690			
SPA-2	J19YH8	5/17/10	0.20		0.20	4.9		2.3	2.7		2.3	3260	U	3260	17400		9800
SPA-2 re-sample 1	J1FKL8	3/17/11	0.37	U	0.37	1.2	U	1.2	1.7	U	1.7	640	U	640			
SPA-3	J19YH9	5/17/10	0.18		0.19	6.9		2.5	1.7	B	2.5	3350	U	3350	10400		10100
SPA-3 re-sample 1	J1FKL9	3/17/11	0.37	U	0.37	1.3	U	1.3	2.0	B	1.8	690	U	690			
SPA-5	J19YJ1	5/17/10	0.17		0.21	2.0	B	2.3	1.8	B	2.3	3330	U	3330	14900		9990
SPA-5 re-sample 1	J1FKM1	3/17/11	39.9		0.37	1.3	B	1.3	43.6		1.8	11000		710			
SPA-6	J19YJ2	5/17/10	0.60		0.21	17.8		2.4	6.6		2.4	3360	U	3360	141000		10100
SPA-6 re-sample 1	J1FKM2	3/17/11	50.9		0.36	1.9	B	1.3	18.2		1.9	8500		720			
SPA-7	J19YJ3	5/17/10	0.41		0.20	3.4		2.2	2.6		2.2	3320	U	3320	10500		9970
SPA-7 re-sample 1	J1FKM3	3/17/11	0.43	B	0.38	1.7	B	1.3	2.0	B	1.8	9500		720			
SPA-8	J19YJ4	5/17/10	0.48		0.20	12.1		2.4	3.4		2.4	3360	U	3360	40800		10100
SPA-8 re-sample 1	J1FKM4	3/17/11	0.85		0.38	1.3	U	1.3	55.6		1.8	7100		690			
SPA-9	J19YJ5	5/17/10	1.34		0.21	9.6		2.4	3.2		2.4	3350	U	3350	60800		10100
SPA-9 re-sample 1	J1FKM5	3/17/11	0.46	B	0.40	1.8	B	1.4	2.8	B	1.9	4400		740			
SPA-10	J19YJ6	5/17/10	0.26		0.22	8.6		2.4	2.0	B	2.4	3350	U	3350	58900		10000
SPA-10 re-sample 1	J1FKM6	3/17/11	0.36	U	0.36	1.2	U	1.2	5.4		1.7	820	J	690			
SPA-11	J19YJ7	5/17/10	4.01		0.20	9.8		2.4	4.6		2.4	3310	U	3310	39100		9930
SPA-11 re-sample 1	J1FKM7	3/17/11	1.1		0.36	1.3	U	1.3	9.1		1.8	690	U	690			
SPA-12	J19YJ8	5/17/10	1.26		0.20	12.8		2.4	10		2.4	3350	U	3350	53900		10000
SPA-12 re-sample 1	J1FKM8	3/17/11	0.62	B	0.38	1.7	B	1.3	3.3	B	1.8	4000	J	700			
Duplicate of J19YJ4	J19YJ9	5/17/10	0.47		0.21	14.8		2.2	3.2		2.2	3360	U	3360	64900		10100
Equipment Blank	J19YK0	5/17/10															

Attachment	1	Sheet No.	77 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	TPH diesel range EXT			Percent Solids			pH Measurement		
			ug/kg	Q	PQL	%	Q	PQL	pH unit	Q	PQL
OB-5	J19YF8	5/13/10				99.2		0.1			
Duplicate of J19YF8	J19YH6	5/13/10				99.2		0.1			
OB-1	J19YF4	5/13/10				98.9		0.1			
OB-2	J19YF5	5/13/10				99.7		0.1			
OB-3	J19YF6	5/13/10				99.3		0.1			
OB-4	J19YF7	5/13/10				99.2		0.1			
OB-6	J19YF9	5/13/10				99.3		0.1			
OB-7	J19YH0	5/13/10				99.2		0.1			
OB-8	J19YH1	5/13/10				99.0		0.1			
OB-8 re-sample 1	J1FKL6	3/17/11	6500		1100				9.48		0.01
OB-9	J19YH2	5/13/10				99.5		0.1			
OB-10	J19YH3	5/13/10				99.3		0.1			
OB-11	J19YH4	5/13/10				99.2		0.1			
OB-12	J19YH5	5/13/10				99.1		0.1			
OB-13	J1B4H9	5/17/10				99.6		0.1			
OB-14	J1B4J0	5/17/10				99.7		0.1			
OB-15	J1B4J1	5/17/10				99.5		0.1			
SPA-4	J19YJ0	5/17/10				99.5		0.1			
SPA-4 re-sample 1	J1FKM0	3/17/11	15000		1000				9.6		0.01
Duplicate of J1FKM0	J1FKM9	3/17/11	5700		1000				9.55		0.01
SPA-1	J19YH7	5/17/10				99.7		0.1			
SPA-1 re-sample 1	J1FKL7	3/17/11	1000	U	1000				9.58		0.01
SPA-2	J19YH8	5/17/10				99.6		0.1			
SPA-2 re-sample 1	J1FKL8	3/17/11	940	U	940				9.44		0.01
SPA-3	J19YH9	5/17/10				99.4		0.1			
SPA-3 re-sample 1	J1FKL9	3/17/11	1000	U	1000				9.66		0.01
SPA-5	J19YJ1	5/17/10				99.6		0.1			
SPA-5 re-sample 1	J1FKM1	3/17/11	41000		1000				8.87		0.01
SPA-6	J19YJ2	5/17/10				99.1		0.1			
SPA-6 re-sample 1	J1FKM2	3/17/11	30000		1100				8.82		0.01
SPA-7	J19YJ3	5/17/10				99.7		0.1			
SPA-7 re-sample 1	J1FKM3	3/17/11	35000		1100				9.17		0.01
SPA-8	J19YJ4	5/17/10				99.2		0.1			
SPA-8 re-sample 1	J1FKM4	3/17/11	12000		1000				9.26		0.01
SPA-9	J19YJ5	5/17/10				99.5		0.1			
SPA-9 re-sample 1	J1FKM5	3/17/11	7700		1100				9.09		0.01
SPA-10	J19YJ6	5/17/10				99.4		0.1			
SPA-10 re-sample 1	J1FKM6	3/17/11	2100	J	1000				9.45		0.01
SPA-11	J19YJ7	5/17/10				99.0		0.1			
SPA-11 re-sample 1	J1FKM7	3/17/11	1000	U	1000				9.42		0.01
SPA-12	J19YJ8	5/17/10				99.5		0.1			
SPA-12 re-sample 1	J1FKM8	3/17/11	8800		1000				9.31		0.01
Duplicate of J19YJ4	J19YJ9	5/17/10				99.2		0.1			
Equipment Blank	J19YK0	5/17/10				99.0		0.1			

Attachment	1	Sheet No.	78 of 79
Originator	J. D. Skoglie	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
Calc. No.	0100H-CA-V0164	Rev. No.	0

Attachment 1. 116-H-5 Waste Site Verification Sample Results.

Sample Location	HEIS Number	Sample Date	Percent moisture (wet sample)		
			%	Q	PQL
DZ-1 re-sample 1	J1FKK1	3/16/11	7.0		0
DZ-2 re-sample 1	J1FKK2	3/16/11	6.8		0
DZ-3 re-sample 1	J1FKK3	3/16/11	17.9		0
DZ-4 re-sample 1	J1FKK4	3/16/11	4.4		0
DZ-5 re-sample 1	J1FKK5	3/16/11	5.2		0
DZ-6 re-sample 1	J1FKK6	3/16/11	3.8		0
DZ-7 re-sample 1	J1FKK7	3/16/11	8.2		0
DZ-8 re-sample 1	J1FKK8	3/16/11	5.7		0
DZ-9 re-sample 1	J1FKK9	3/16/11	3.0		0
DZ-10 re-sample 1	J1FKL0	3/16/11	4.7		0
DZ-11 re-sample 1	J1FKL1	3/16/11	9.0		0
DZ-12 re-sample 1	J1FKL2	3/16/11	6.8		0
Duplicate of J1FKK8	J1FKL3	3/16/11	6.9		0
SZ-9 re-sample 1	J1FKL4	3/16/11	6.5		0
SZ-11 re-sample 1	J1FKL5	3/16/11	3.9		0
OB-8 re-sample 1	J1FKL6	3/17/11	6.3		0
SPA-1 re-sample 1	J1FKL7	3/17/11	3.6		0
SPA-2 re-sample 1	J1FKL8	3/17/11	2.8		0
SPA-3 re-sample 1	J1FKL9	3/17/11	3.9		0
SPA-4 re-sample 1	J1FKM0	3/17/11	3.8		0
SPA-5 re-sample 1	J1FKM1	3/17/11	4.8		0
SPA-6 re-sample 1	J1FKM2	3/17/11	7.2		0
SPA-7 re-sample 1	J1FKM3	3/17/11	7.1		0
SPA-8 re-sample 1	J1FKM4	3/17/11	6.4		0
SPA-9 re-sample 1	J1FKM5	3/17/11	9.8		0
SPA-10 re-sample 1	J1FKM6	3/17/11	3.1		0
SPA-11 re-sample 1	J1FKM7	3/17/11	2.6		0
SPA-12 re-sample 1	J1FKM8	3/17/11	5.9		0
Duplicate of J1FKM0	J1FKM9	3/17/11	3.9		0
Equipment Blank	J1FKN0	3/17/11	0.12		0
DZ-1 re-sample 2	J1HH80	4/13/11	7.0		0
DZ-2 re-sample 2	J1HH81	4/13/11	3.5		0
DZ-3 re-sample 2	J1HH82	4/13/11	1.6		0
DZ-4 re-sample 2	J1HH83	4/13/11	2.7		0
DZ-7 re-sample 2	J1HH84	4/13/11	13.2		0
DZ-8 re-sample 2	J1HH85	4/13/11	3.1		0
Duplicate of J1HH85	J1HH86	4/13/11	3.0		0
Equipment Blank	J1HH87	4/13/11	0.1	U	0

Attachment	1	Sheet No.	79 of 79
Originator	J. D. Skoglic	Date	5/17/11
Checked	T. E. Queen	Date	5/17/11
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Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental Calculation No: 0100H-CA-V0165

Subject: 116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 4 Total = 5	J. D. Skoglie	T. E. Queen TEQueen	B. L. Vedder	D. F. Obenauer D. F. Obenauer	6/22/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007)

DE01-437.03

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/17/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/17/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 116-H-5 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009a), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2009a, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2009b, *100 Area Remedial Action Sampling and Analysis Plan,* DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

4) WCH, 2011, *Remaining Sites Verification Package for the 116-H-5, 1904-H Outfall Structure*, Attachment to Waste Site Reclassification Form 2011-012, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the individual HQ of <1.0 (DOE-RL 2009a).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the excess cancer risk of $<1 \times 10^{-6}$ (DOE-RL 2009a).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/18/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/18/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 4	

METHODOLOGY:

The 116-H-5 waste site is comprised of four decision units for verification sampling, consisting of the shallow zone, deep zone, overburden, and staging pile area. The direct contact hazard quotient and carcinogenic risk calculations for the 116-H-5 waste site were conservatively calculated for the shallow zone, overburden, and staging pile area using the statistical verification soil sample results (WCH 2011). Of the contaminants of potential concern (COPCs) for this site nitrogen in nitrate and nitrite required an HQ and risk calculation because this analyte was detected above the background value. Boron, hexavalent chromium, molybdenum, bis(2-ethylhexyl)phthalate, the detected polycyclic aromatic hydrocarbons, pesticides, and polychlorinated biphenyls require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Although total petroleum hydrocarbons (diesel range extended) were detected and no background value is available, the risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation. Lead was detected above background; however, lead does not have a reference dose for calculation of a hazard quotient because toxic effects of lead are correlated with blood-lead levels rather than exposure levels or daily intake. Additionally, arsenic was detected above background; however, the arsenic standard is not toxicity based. All other site nonradionuclide COPCs were not detected or were quantified below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the maximum value for boron is 2.4 mg/kg, divided by the noncarcinogenic RAG value of 7,200 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is 3.3×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation. The sum of the HQ values is 1.2×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1.0×10^{-6}. For example, the maximum value for hexavalent chromium is 0.16 mg/kg, divided by 2.1 mg/kg, and multiplied as indicated, is 7.6×10^{-8}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual cancer risk values prior to rounding are used for this calculation. The sum of the excess cancer risk values is 1.0×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/18/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/18/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 4	

4) List the cumulative excess cancer risk for carcinogens >1 x 10^{-5}: None

Table 1 (2 pages) shows the results of the hazard quotient and excess cancer risk calculations.

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 116-H-5 Waste Site (2 pages).

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Arsenic[c]	14.0	20	--	--	--
Boron	2.4	7,200	3.3E-04	--	--
Chromium, hexavalent[d]	0.16	240	6.7E-04	2.1	7.6E-08
Lead[e]	33.4	353	--	--	--
Molybdenum	0.33	400	8.3E-04	--	--
Anions					
Nitrogen in nitrate and nitrite	16.0	128,000	1.3E-04	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.121	1,600	7.6E-05	71.4	1.7E-09
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.0219	4,800	4.6E-06	--	--
Acenaphthylene[f]	0.027	4,800	5.6E-06	--	--
Anthracene	0.087	24,000	3.6E-06	--	--
Benzo(a)anthracene	0.0785	--	--	1.37	5.7E-08
Benzo(a)pyrene	0.0885	--	--	0.137	6.5E-07
Benzo(b)fluoranthene	0.105	--	--	1.37	7.7E-08
Benzo(ghi)perylene[f]	0.096	2,400	4.0E-05	--	--
Benzo(k)fluoranthene	0.023	--	--	1.37	1.7E-08
Chrysene	0.113	--	--	13.7	8.2E-09
Dibenz(a,h)anthracene	0.026	--	--	1.37	1.9E-08
Fluoranthene	0.400	3,200	1.3E-04	--	--
Fluorene	0.057	3,200	1.8E-05	--	--
Indeno(1,2,3-cd)pyrene	0.0834	--	--	1.37	6.1E-08
Naphthalene	0.0251	1,600	1.6E-05	--	--
Phenanthrene[f]	0.107	24,000	4.5E-06	--	--
Pyrene	0.342	2,400	1.4E-04	--	--
Pesticides					
DDE, 4,4'-	0.040	--	--	2.94	1.4E-08
DDT, 4,4'-	0.0053	40	1.3E-04	2.94	1.8E-09

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	5/17/2011	Calc. No.:	0100H-CA-V0165	Rev.:	0
Project:	100-H Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	5/17/2011
Subject:	116-H-5 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 4 of 4	

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 116-H-5 Waste Site (2 pages).

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Aroclor-1254	0.015	1.6	9.4E-03	0.5	3.0E-08
Aroclor-1260	0.010	--	--	0.5	2.0E-08
Total Petroleum Hydrocarbons					
Diesel Range Extended[g]	19.4	200	--	--	--
Motor oil (high boiling)[g]	147	200	--	--	--
Totals					
Cumulative Hazard Quotient:			**1.2E-02**		
Cumulative Excess Cancer Risk:					**1.0E-06**

[a] = From WCH (2011).

[b] = Value obtained from the RDR/RAWP (DOE-RL 2009a) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009a).

[d] = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.

[e] = Value for the noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[f] = Toxicity data for acenaphthylene, benzo(ghi)perylene, and phenanthrene are not available. The cleanup level is based on use of
acenaphthylene surrogate: acenaphthene
benzo(ghi)perylene surrogate: pyrene
phenanthrene surrogate: anthracene

[g] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

-- = not applicable RAG = remedial action goal

CONCLUSION:

The calculations in Table 1 demonstrates that the 116-H-5 waste site meets the requirements for the direct contact hazard quotients and carcinogenic (excess cancer) risk, respectively, as identified in the RDR/RAWP (DOE-RL 2009a) and SAP (DOE-RL 2009b). The direct contact hazard quotients and carcinogenic (excess cancer) risk calculations are for use in the RSVP for this site.

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-H Area Field Remediation **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0166

Subject: 116-H-5 Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater

Computer Program: Excel Program No: Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 4 Total = 5	C. H. Dobie CH Dobie	T. E. Queen T Queen	B. L. Vedder BL Vedder	D. F. Obenauer D. F. Obenauer	6/22/11

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie	Date:	6/1/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	6/1/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No.	1 of 4

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and excess carcinogenic risk associated with soil contaminant levels compared to soil cleanup levels for protection of groundwater for the 116-H-5 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens.
2) A cumulative HQ of <1.0 for noncarcinogens.
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) BHI, 2005, *100 Area Analogous Sites RESRAD Evaluation*, Calculation No. 0100X-CA-V0050 Rev 0, Bechtel Hanford, Inc., Richland, Washington.

2) DOE-RL, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

4) WCH, 2011, *116-H-5 Waste Site Cleanup Verification 95% UCL Calculations*, 0100H-CA-V0164, Rev. 0, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate a HQ for each noncarcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (BHI 2005).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (BHI 2005).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie	Date:	6/1/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	6/1/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 2 of 4	

METHODOLOGY:

The 116-H-5 waste site was divided into four decision units for the purpose of verification sampling; the deep zone excavation, the shallow zone excavation, the staging pile footprint, and the overburden soil stockpile. Hazard quotient and carcinogenic risk calculations for potential impact to groundwater at the 116-H-5 waste site were conservatively calculated for the entire waste site using the statistical or maximum value for each analyte in all decision units from the 95% UCL calculation (WCH 2011). Boron, hexavalent chromium, molybdenum, nitrogen in nitrate, nitrogen in nitrite, acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene, and 4,4'-DDD are included because they do not have a Hanford Site-specific or Washington State background value available and their respective distribution coefficient is less than necessary to show no migration to groundwater in 1,000 years using the generic site RESRAD model (BHI 2005). Based on this model and a vadose zone of approximately 0.0 m (0.0 ft) thickness, a K_d value of 80 mL/g is adequate to show no predicted risk to groundwater in 1,000 years. Contaminants with a K_d of 80 mL/g are highly adsorbed to soil particles, and even when immersed in water, any migration will be negligible. Therefore, HQ and risk calculations were performed with the exclusion of these analytes with a K_d over 80 mL/g. Aroclor-1254 is included in the calculation because its K_d (75.6) does not allow for the exclusion from this site. However, the single detection of aroclor-1254 was in the staging pile area, where only a K_d of 7.2 is required to show protection of groundwater. Therefore, aroclor-1254 is included for completeness, but is not necessary to calculate the groundwater HQ. All other site nonradionuclide COPCs were not detected, or quantified below background levels. Additionally, arsenic, lead, TPH-diesel range, TPH-diesel range EXT, and TPH-motor oil (high boiling) were detected above background; however, the standard for each contaminant is not toxicity based, therefore a groundwater HQ is not calculated. An example of the HQ and risk calculations for soil constituents with a potential impact to groundwater is presented below:

1) The hazard quotient is defined as the ratio of the dose of a substance obtained over a specified time (mg/kg/day) to a reference dose for the same substance derived over the same specified time (mg/kg/day). The hazard quotient can also be calculated as the ratio of the concentration in soil (maximum or statistical value) (mg/kg) to the soil RAG (mg/kg) for protection of groundwater, where the RAG is the groundwater cleanup level (mg/L) (calculated with, and related to the hazard quotient through, WAC 173-340-720(3)(a)(ii)(A), 1996) x 100 x 1 mg/1000 mg (conversion factor)). This is based on the "100 times rule" of WAC 173-340-740(3)(a)(ii)(A) (1996). For example, the maximum value for boron of 2.4 mg/kg, divided by the noncarcinogenic RAG value of 320 mg/kg is 7.5×10^{-3}. Comparing this value to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation.) The cumulative HQ for the 116-H-5 waste site is 6.5×10^{-1}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, and then multiplied by 1×10^{-6}. For example, the maximum value for 4,4'-DDD is 0.00212 mg/kg, divided by 0.0365 mg/kg, and multiplied as indicated, is 5.8×10^{-8}. Comparing this value to the requirement of $<1 \times 10^{-6}$, this criterion is met. Aroclor-1254 exceeded the individual carcinogenic risk value. This value is based on only one detected result located in the staging pile

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie	Date:	6/1/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen	Date:	6/1/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 3 of 4	

area. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009), the residual concentration of aroclor-1254 is not expected to migrate more than 0.25 m (0.825 ft) vertically in 1,000 years (based on the distribution coefficient of 75.6 mL/g). The vadose zone underlying the soil below the staging pile area is approximately 10.0 m (33.0 ft) thick. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River. The cumulative excess cancer risk for the 116-H-5 waste site is 5.8×10^{-8}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

4) The soil cleanup RAGs for protection of groundwater are based on the "100 times" provision in WAC 173-340-740(3)(a)(ii)(A). WAC 173-340-740(3)(a)(ii)(A) (1996) provides the "100 times rule" but also states "unless it can be demonstrated that a higher soil concentration is protective of ground water at the site." When the "100 times rule" values are exceeded, RESRAD was used to demonstrate that higher soil concentrations may be protective of groundwater.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None.
2) List the cumulative noncarcinogenic HQ >1.0: None.
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None.
4) List the cumulative excess cancer risk for carcinogens $>1 \times 10^{-5}$: None.

Table 1 shows the results of the calculations.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	C. H. Dobie CHD	Date:	6/2/2011	Calc. No.:	0100H-CA-V0166	Rev.:	0
Project:	100-H Area Field Remediation	Job No:	14655	Checked:	T. E. Queen TEQ	Date:	6/2/2011
Subject:	116-H-5 Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No. 4 of 4	

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 116-H-5 Waste Site.

Contaminants of Potential Concern	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Arsenic	14.0	20 [c]	--	--	--
Boron	2.4	320	7.5E-03	--	--
Chromium, hexavalent	0.16	4.8	3.3E-02	--	--
Lead [d]	33.4	353	--	--	--
Molybdenum	0.87	8	1.1E-01	--	--
Inorganic Anions and TPH					
Nitrogen in Nitrate	34.0	2,560	1.3E-02	--	--
Nitrogen in Nitrite	0.40	160	2.5E-03	--	--
TPH - diesel range EXT	19.4	200 [e]	--	--	--
TPH - motor oil (high boiling)	147	200 [e]	--	--	--
Semivolatiles					
Acenaphthene	0.0219	96	2.3E-04	--	--
Acenaphthylene [f]	0.027	96	2.8E-04	--	--
Anthracene	0.087	240	3.6E-04	--	--
Fluoranthene	0.400	64	6.3E-03	--	--
Fluorene	0.057	64	8.9E-04	--	--
Naphthalene	0.0251	16	1.6E-03	--	--
Phenanthrene [f]	0.107	240	4.5E-04	--	--
Pyrene	0.342	48	7.1E-03	--	--
Pesticides					
DDD, 4,4'-	0.00212	--	--	0.0365	5.8E-08
Polychlorinated Biphenyls					
Aroclor-1254 [g]	0.015	0.032	4.7E-01	0.00438	3.4E-06
Totals					
Cumulative Hazard Quotient:			**6.5E-01**		
Cumulative Excess Cancer Risk:					**5.8E-08**

Notes:

[a] = From WCH (2011).

[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the "100 times" model.

[c] = The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project Managers as discussed in Section 2.1.2.1 of the RDR/RAWP (DOE-RL 2009). The arsenic standard is not toxicity based, therefore, will not have a hazard quotient calculated.

[d] = Value for noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[e] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

[f] = Toxicity data for these chemicals are not available. Cleanup levels are based on surrogate chemicals:
Contaminant: acenapthylene; surrogate: acenapthene
Contaminant: phenathrene; surrogate: anthracene

[g] = Aroclor-1254 was only detected in one location in the staging pile area. Based on RESRAD modeling discussed in Appendix C of the RDR/RAWP (DOE-RL 2009), the residual concentration of aroclor-1254 is not expected to migrate more than 0.25 m (0.825 ft) vertically in 1,000 years (based on the distribution coefficient of 75.6 mL/g). The vadose zone underlying the soil below the staging pile area is approximately 10.0 m (33.0 ft) thick. Therefore, the residual concentration of this constituent is predicted to be protective of groundwater and the Columbia River, and is not considered a carcinogenic risk to groundwater.

-- = not applicable

RAG = remedial action goal

CONCLUSION:

This calculation demonstrates that the 116-H-5 waste site meets the requirements for the hazard quotients and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2009).

APPENDIX E

DATA QUALITY ASSESSMENT

APPENDIX E

DATA QUALITY ASSESSMENT

VERIFICATION SAMPLING

A data quality assessment (DQA) was performed to compare the verification sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (WCH 2010). This DQA was performed in accordance with site-specific data quality objectives found in the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2009).

A review of the sample design (WCH 2010), the field logbooks (WCH 2011a, 2011b), and applicable analytical data packages has been performed as part of this DQA. All samples were collected and analyzed per the sample design. To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical analysis and radiochemical analysis (BHI 2000a, BHI 2000b) are used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., closeout decisions). The DQA completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2006).

Verification sample data collected at the 116-H-5 waste site were provided by the laboratories in eight sample delivery groups (SDGs): SDG K2057, SDG K2058, SDG K2051, SDG K2053, SDG JP0125, SDG J01037, SDG JP0127, and SDG JP0163. SDG K2057 was submitted for third-party validation. Major and minor deficiencies are discussed for the 116-H-5 data set, as follows below. If no comments are made about a specific analysis, it should be assumed that no deficiencies affecting the quality of the data were found.

MAJOR DEFICIENCIES

Due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, third-party validation flagged the undetected nitrite results in SDG K2057 as rejected, flagged with a "UR." The samples were collected on May 18, 2010, and they were analyzed on June 8, 2010. In addition, the preparation holding time was exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate in SDG K2058, SDG K2051, SDG K2053, SDG JP0127, and SDG J01037. The SDG K2058 samples were collected on May 18, 2010, and analyzed on June 8, 2010. The project flagged the undetected orthophosphate value for sample J19YC9 and all nitrite values for SDG K2058 as rejected with a "UR" flag. The SDG K2051 samples were collected on May 13, 2010, and analyzed on May 24, 2010. The project flagged the undetected nitrate values for samples J19YF4, J19YF5, and J19YH0, the orthophosphate values for sample J19YF8 and J19YH2, and all nitrite values for SDG K2051 as rejected with a "UR" flag. The SDG K2053 samples were collected on May 17, 2010, and analyzed on May 24, 2010. The project flagged the undetected orthophosphate values for samples J19YH8, J19YH9, and J19YJ1, and all nitrite values for SDG K2053 as rejected with a "UR" flag. The SDG J01037 samples were collected on March 16, 2011, and analyzed on March 22, 2011. The project flagged the undetected orthophosphate value for sample J1FKL4, and both nitrite values for SDG J01037 as rejected with a "UR" flag. The SDG JP0127 samples were collected on March 16, 2011, and analyzed on March 21, 2011. The project flagged the undetected orthophosphate values for samples J1FKL6, J1FKL8, J1FKL9, J1FKM0, J1FKM4, J1FKM6, J1FKM7, and J1FKM9, and all nitrite values for SDG JP0127 as rejected with a "UR" flag. The laboratory reports nitrate, nitrite, and phosphate results when running the IC anion method employed primarily to obtain the sulfate and chloride data. The U.S. Environmental Protection Agency (EPA) analytical method 353.2 was requested to provide acceptable nitrate/nitrite data for decision making purposes. Phosphate is not a regulated chemical under *Washington Administrative Code* (WAC) 173-340, "Model Toxics Control Act – Cleanup." The rejection of the undetected nitrite and orthophosphate data does not hinder the evaluation of the 116-H-5 waste site.

MINOR DEFICIENCIES

SDG K2057

This SDG comprises 10 statistical soil samples (J19YB8-J19YB9, J19YC0 through J19YC7) from the 116-H-5 shallow-zone excavation, and 10 statistical soil samples (J19YD1 through J19YD9, J19YF0) from the 116-H-5 deep-zone excavation. These samples were analyzed for inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, polychlorinated biphenyls (PCB), pesticides, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAH), ion chromatography (IC) anions, nitrate/nitrite, total petroleum hydrocarbons (TPH), carbon-14, nickel-63,and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, and by gamma energy analysis (GEA). SDG K2057 was submitted for third-party validation. Minor deficiencies are as follows:

In the TPH analysis, all of the motor oil data in SDG K2057 were qualified by third-party validation as estimated with "J" flags, due to lack of a matrix spike (MS), matrix spike duplicate (MSD), and laboratory control sample (LCS) analysis. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the SVOC analysis, the LCS recoveries for 2,4-dinitrophenol (15%), 4,6-dinitro-2-methylphenol (28%), and pentachlorophenol (40%) were below the quality control (QC) criteria. The MSD recoveries for 2,4,6-trichlorophenol (42%) and hexachlorocyclopentadiene (37%) were also below the QC criteria. Due to the low LCS or MSD recoveries for these analytes, third-party validation qualified all the results for these analytes as estimates and flagged "J." Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the SVOC analysis, the MS/MSD relative percent difference (RPD) for 1,2,4-trichlorobenzene (37%), 2,4,5-trichlorophenol (49%), and 2,4,6-trichlorophenol (74%) are above the QC limits. Third-party validation qualified all the results for these analytes as estimates and flagged "J" due to the RPDs outside QC limits. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, third-party validation flagged the detected nitrate, nitrite, and orthophosphate results in SDG K2057 as estimates, flagged with a "J." Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the IC anions analysis, the nitrate and sulfate results in sample J19YD3 and the nitrate result in sample J19YD4 were qualified by third-party validation as estimated with "J" flags, due to lack of an MS analysis. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the carbon-14 and tritium results were qualified by third-party validation as estimated with "J" flags, due to lack of an MS analysis. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the PAH analysis, a surrogate recovery was above the QC limit for sample J19YD7. All detected PAH results for sample J19YD7 were qualified as estimated with "J" flags. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the pesticides analysis, all of the toxaphene data in SDG K2057 were qualified by third-party validation as estimated with "J" flags, due to lack of an MS, MSD, and LCS analysis. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the PCB analysis, a surrogate recovery was below the QC limit for samples J19YD7 and J19YF0. All PCB results for samples J19YD7 and J19YF0 were qualified as estimated with "J" flags. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for three analytes (aluminum, iron, and antimony). For aluminum and iron the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 55%. All antimony data for SDG K2057 were considered estimated and flagged "J" by third-party validation due to the MS recoveries outside the QC limits. Estimated data are usable for decision-making purposes.

SDG K2058

This SDG comprises three statistical soil samples (J19YC8, J19YC9, and J19YD0) from the 116-H-5 shallow-zone excavation, and three statistical soil samples (J19YF1-J19YF3) from the 116-H-5 deep-zone excavation. These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, pesticides, SVOCs, PAH, IC anions, nitrate/nitrite, TPH, carbon-14, nickel-63, and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, and by GEA. Minor deficiencies are as follows:

In the radionuclide analysis, all of the carbon-14 and tritium results may be considered estimated due to lack of an MS analysis. The data are acceptable for decision-making purposes.

In the TPH analysis, all of the motor oil data in SDG K2058 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the TPH analysis, a surrogate recovery was above the QC limit for sample J19YF1. The detected motor oil result for sample J19YF1 may be considered estimated. The data is acceptable for decision-making purposes.

In the pesticides analysis, all of the toxaphene data in SDG K2058 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and orthophosphate results in SDG K2058 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOC analysis, the LCS recoveries for 2,4,6-trichlorophenol (43%), 2,4-dimethylphenol (35%), 4-chloro-3-methylphenol (40%), 4-nitrophenol (42%), hexachlorocyclopentadiene (38%), and pentachlorophenol (41%) were below the QC criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the MS and MSD recoveries for 1,2,4-trichlorobenzene (34% and 40%), 1,2-dichlorobenzene (37% and 46%), 1,3-dichlorobenzene (36% and 44%), 1,4-dichlorobenzene (35% and 43%), 2,4,5-dichlorophenol (36% and 48%), 2,4,6-trichlorophenol (37% and 47%), 2,4-dichlorophenol (42% and 47%), 2,4-dimethylphenol (47% and 49%), 2-methylnaphthalene (43% and 47%), 2-nitrophenol (41% and 48%), 3,3'-dichlorobenzidine (31% and 37%), 4-chloroaniline (25% and 27%), 4-nitrophenol (40% and 44%), benz(a)anthracene (41% and 42%), benzo(a)pyrene (42% and 43%), benzo(b)fluoranthene (39% and 43%), benzo(k)fluoranthene (44% and 42%), bis(2-chloroethoxy)methane (40% and 47%), bis(2-chloroethyl)ether (41% and 49%), bis(2-chloroisopropyl)ether (39% and 47%), chrysene (41% and 42%), fluoranthene (28% and 30%), hexachlorobutadiene (36% and 43%), hexachlorocyclopentadiene (15% and 22%), hexachloroethane (31% and 40%), naphthalene (38% and 44%), nitrobenzene (39% and 44%), pentachlorophenol (12% and 11%), and pyrene (35% and 31%) were below the QC criteria. In addition, the MS recoveries for 2-chlorophenol (42%), 2-methylphenol (47%), benzo(g,h,i)perylene (49%), isophorone (39%), n-nitrosodi-n-propylamine (49%), and phenol (49%) were below the QC criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the PAH analysis, a surrogate recovery was above the QC limit for sample J19YC8. The detected PAH results for sample J19YC8 may be considered estimated. The data is acceptable for decision-making purposes.

In the PAH analysis, the MS and MSD recoveries for phenanthrene (32% and 206%), fluoranthene (-18% and 734%), indeno(1,2,3-cd)pyrene (262% and 545%), benz(a)anthracene (4% and 439%), chrysene (5% and 397%), and benzo(a)pyrene (11% and 524%) were outside the QC limits. In addition, the MSD recoveries for pyrene (535%), benzo(b)fluoranthene (666%), benzo(k)fluoranthene (274%), dibenz(a,h)anthracene (163%), and benzo(g,h,i)perylene (293%) were above the acceptance criteria. The laboratory indicated matrix interference as the probable cause for the MS and MSD recoveries. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for five analytes (aluminum, iron, manganese, antimony, and silicon). For most of these analytes the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 44%. All antimony data for SDG K2058 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all silicon results may be considered estimated due to an LCS below quality control limits at 63%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all boron results may be considered estimated due to an RPD above quality control limits at 48%. Estimated data are usable for decision-making purposes.

SDG K2051

This SDG comprises 13 statistical soil samples (J19YF4 through J19YF9, J19YH0 through J19YH6) from the 116-H-5 overburden. This SDG includes a field duplicate pair (J19YF8/J19YH6). These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, pesticides, SVOCs, PAH, IC anions, nitrate/nitrite, TPH, carbon-14, nickel-63, and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, and by GEA. Minor deficiencies are as follows:

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and orthophosphate results in SDG K2051 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the IC anions analysis, the fluoride results may be considered estimated due to an RPD above quality control limits at 41%. Estimated data are usable for decision-making purposes.

In the nitrate/nitrite analysis, the results may be considered estimated due to an RPD above quality control limits at 39%. Estimated data are usable for decision-making purposes.

In the radionuclide analysis, all of the carbon-14 and tritium results may be considered estimated due to lack of an MS analysis. The data are acceptable for decision-making purposes.

In the pesticides analysis, all of the toxaphene data in SDG K2051 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the PAH analysis, a surrogate recovery was above the QC limit for sample J19YH1. The detected PAH results for sample J19YH1 may be considered estimated. The data is acceptable for decision-making purposes.

In the SVOC analysis, the LCS recoveries for each analyte ranged between 6% and 33%, all below the QC criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the MS and MSD recoveries for 4-chloroaniline (47% and 48%) were below the acceptance criteria. In addition, the MS recovery for 2,4-dinitrophenol (48%) and the MSD recovery for pentachlorophenol (45%) were below the QC criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the TPH analysis, all of the motor oil data in SDG K2051 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for four analytes (chromium, manganese, antimony, and silicon). For iron and manganese the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 52% and 177%, respectively. All antimony and silicon data for SDG K2051 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all silicon results may be considered estimated due to an LCS below quality control limits at 43%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all molybdenum results may be considered estimated due to an RPD above quality control limits at 35%. Estimated data are usable for decision-making purposes.

SDG K2053

This SDG comprises three statistical soil samples (J1B4H9, J1B4J0, and J1B4J1) from the 116-H-5 overburden and 13 statistical soil samples (J19YH7 through J19YH9, J19YJ0 through J19YJ9) from the staging pile area. This SDG included a field duplicate pair (J19YJ4/J19YJ9). These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, pesticides, SVOCs, PAH, IC anions, nitrate/nitrite, TPH, carbon-14, nickel-63, and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, and by GEA. In addition, one equipment blank (J19YK0) was analyzed for ICP metals, mercury, and SVOCs. Minor deficiencies are as follows:

In the radionuclide analysis, all of the carbon-14 and tritium results may be considered estimated due to lack of an MS analysis. The data are acceptable for decision-making purposes.

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and orthophosphate results in SDG K2053 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the IC anions analysis, the fluoride and sulfate results may be considered estimated due to an RPD above quality control limits at 55.1% and 49.5%, respectively. Estimated data are usable for decision-making purposes.

In the pesticides analysis, all of the toxaphene data in SDG K2053 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the pesticides analysis, the MS recovery for methoxychlor (154%) is above the QC criteria. The methoxychlor results may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, one surrogate recovery for sample J19YH8 is below the acceptance criteria. The SVOC data for sample J19YH8 may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the LCS recoveries for 2,4,6-trichlorophenol (38%), 2,4-dimethylphenol (46%), 4-chloroaniline (40%), hexachlorocyclopentadiene (43%), and pentachlorophenol (34%), were all below the QC criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the MS and MSD recoveries for hexachlorocyclopentadiene (38% and 29%) and pentachlorophenol (42% and 46%) were below the acceptance criteria. In addition, the MSD recovery for di-n-octyl phthalate (156%) was above the QC criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the MS/MSD RPDs for benzo(b)fluoranthene (31%), benzo(k)fluoranthene (39%), chrysene (31%), di-n-octyl phthalate (31%), fluoranthene (46%), and pyrene (36%), were above the acceptance criteria. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the PAH analysis, the surrogate recovery for sample J19YJ2 is above the acceptance criteria. All detected PAH data for sample J19YJ2 may be considered estimated. Estimated data are usable for decision-making purposes.

In the PAH analysis, the MS and MSD recoveries for phenanthrene (154% and 184%), fluoranthene (301% and 904%), pyrene (247% and 849%), benz(a)anthracene (169% and 364%), chrysene (250% and 241%), and benzo(b)fluoranthene (376% and 422%) were above the QC limits. In addition, the MSD recoveries for acenaphthene (44%), anthracene (180%), indeno(1,2,3-cd)pyrene (327%), benzo(k)fluoranthene (251%), benzo(a)pyrene (372%), dibenz(a,h)anthracene (160%), and benzo(g,h,i)perylene (277%) were outside the acceptance criteria. The laboratory indicated sample interference as the probable cause for the MS and MSD recoveries. The results for these analytes may be considered estimated. The data are acceptable for decision-making purposes.

In the TPH analysis, all of the motor oil data in SDG K2053 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the TPH analysis, the MS and MSD for the diesel range organics in SDG K2053 are above the QC criteria at 153% and 121%, respectively. The diesel range organics data may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for four analytes (aluminum, iron, antimony, and silicon). For aluminum and iron the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 56% and 204%, respectively. All antimony and silicon data for SDG K2053 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all arsenic results may be considered estimated due to an RPD above quality control limits at 37%. Estimated data are usable for decision-making purposes.

SDG JP0125

This SDG comprises 13 statistical soil samples (J1FKK1 through J1FKK9, J1FKL0 through J1FKL3) from the 116-H-5 deep-zone excavation. These samples were taken to replace the ICP metals, mercury, SVOC, and PAH results for samples J19YD1 through J19YD9 and J19YF0 through J19YF3, reported in SDG K2057 and SDG K2058. This SDG includes a field duplicate pair (J1FKK8/J1FKL3). Minor deficiencies are as follows:

In the ICP metals analysis, all silicon results may be considered estimated due to an LCS below quality control limits at 11%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for four analytes (aluminum, iron, antimony, and silicon). For aluminum and iron the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 66% and 15%, respectively. All antimony and silicon data for SDG JP0125 may be considered estimated. Estimated data are usable for decision-making purposes.

SDG JP0127

This SDG comprises 13 statistical soil samples (J1FKL7 through J1FKL9, J1FKM0 through J1FKM9) from the staging pile area. This SDG included a field duplicate pair (J1FKM0/J1FKM9). These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, pesticides, SVOCs, PAH, IC anions, nitrate/nitrite, TPH, carbon-14, nickel-63, and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, and by GEA. In addition, one equipment blank (J1FKN0) was analyzed for ICP metals, mercury, and SVOCs. These samples were taken to replace the original staging pile area samples (J19YH7 through J19YH9, J19YJ0 through J19YJ9) and equipment blank sample (J19YK0), reported in SDG K2053. Minor deficiencies are as follows:

In the hexavalent chromium analysis, all results may be considered estimated due to an RPD above quality control limits at 40%. Estimated data are usable for decision-making purposes.

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and orthophosphate results in SDG JP0127 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOC analysis, the bis(2-ethylhexyl)phthalate results are of similar magnitude as the method blank result, and may be considered estimated due to method blank contamination. The data are usable for decision-making purposes.

In the pesticides analysis, all of the toxaphene data in SDG JP0127 may be considered estimated due to lack of an MS, MSD, and LCS analysis. Estimated data are acceptable for decision-making purposes.

In the pesticides analysis, the MSD recovery for 4,4'-DDE (12%) is below the QC criteria. The 4,4'-DDE results may be considered estimated. The data are acceptable for decision-making purposes.

In the ICP metals analysis, all silicon results may be considered estimated due to an LCS below quality control limits at 9%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for five analytes (aluminum, iron, manganese, antimony, and silicon). For aluminum, iron, and manganese the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 54% and 12%, respectively. All antimony and silicon data for SDG JP0127 may be considered estimated. Estimated data are usable for decision-making purposes.

SDG J01037

This SDG comprises two statistical soil samples (J1FKL4 and J1FKL5) from the shallow zone. These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, pesticides, SVOCs, PAH, IC anions, nitrate/nitrite, TPH, carbon-14, nickel-63, and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, and by GEA. These samples were taken to replace the original shallow zone samples J19YC6 and J19YC8, reported in SDG K2057 and K2058. Minor deficiencies are as follows:

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and orthophosphate results in SDG J01037 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the IC anions analysis, the orthophosphate result for sample J1FKL5 is of similar magnitude as the method blank result, and may be considered estimated due to method blank contamination. The data is usable for decision-making purposes.

In the ICP metals analysis, the silicon result may be considered estimated due to an LCS below quality control limits at 40%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for five analytes (aluminum, iron, manganese, antimony, and silicon). For aluminum, iron, and manganese the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 64% and

41%, respectively. All antimony and silicon data for SDG J01037 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all beryllium and cadmium results may be considered estimated due to RPDs above quality control limits at 32% and 52%, respectively. Estimated data are usable for decision-making purposes.

SDG JP0163

This SDG comprises seven statistical soil samples (J1HH80 through J1HH86) from the 116-H-5 deep-zone excavation. These samples were taken to replace the ICP metals, mercury, SVOCs, and PAH results for samples J1FKK1 through J1FKK4, J1FKK7 through J1FKK8, and J1FKL3, reported in SDG JP0125. This SDG includes a field duplicate pair (J1HH85/J1HH86). In addition, one equipment blank (J1HH87) was analyzed for ICP metals, mercury, and SVOCs. Minor deficiencies are as follows:

In the SVOC analysis, the bis(2-ethylhexyl)phthalate results are of similar magnitude as the method blank result, and may be considered estimated due to method blank contamination. The data are usable for decision-making purposes.

In the ICP metals analysis, the chromium and zinc results for sample J1HH87 (the equipment blank) are of similar magnitude as the method blank results, and may be considered estimated due to method blank contamination. The data are usable for decision-making purposes.

In the ICP metals analysis, the silicon result may be considered estimated due to an LCS below quality control limits at 16%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for four analytes (aluminum, iron, antimony, and silicon). For aluminum and iron the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 51% and 16%, respectively. All antimony and silicon data for SDG JP0163 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all silicon results may be considered estimated due to an RPD above quality control limits at 32%. Estimated data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

Relative percent difference evaluations of main sample(s) versus the laboratory duplicate(s) are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance (QA)/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Field QA/QC samples, listed in the field logbook (WCH 2011a, 2011b), are shown in Table E-1. The main and QA/QC sample results are presented in Appendix D.

Table E-1. Field Quality Assurance/Quality Control Samples.

Sample Area	Main Sample	Duplicate Sample
Shallow Zone	J19YB9	J19YD0
Deep Zone	J1HH85	J1HH86
Staging Pile Area	J1FKM0	J1FKM9
Overburden	J19YF8	J19YH6

Field duplicate samples are collected to provide a relative measure of the degree of local heterogeneity in the sampling medium, unlike laboratory duplicates that are used to evaluate precision in the analytical process. The field duplicates are evaluated by computing the RPD of the sample/duplicate pair(s) for each contaminant of potential concern (COPC). RPDs are not calculated for analytes that are not detected in both the main and duplicate sample at more than 5 times the target detection limit (TDL). RPDs of analytes detected at low concentrations (less than 5 times the detection limit) are not considered to be indicative of the analytical system performance. The calculation brief in Appendix D provides details on duplicate pair evaluation and RPD calculation.

The RPDs for benzo(a)pyrene (34.5%), fluoranthene (31.9%), phenanthrene (59.5%), and TPH motor oil (45.6%) in the staging pile area duplicate sample are all above the acceptance criteria of 30%. A secondary check of the data variability is used when one or both of the samples being evaluated (main and duplicate) is less than 5 times the TDL, including undetected analytes. In these cases, a control limit of ±2 times the TDL is used (Appendix D) to indicate that a visual check of the data is required by the reviewer. The benzo(g,h,i)perylene and anthracene duplicate sample results from the staging pile area required this check. A visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The data are usable for decision-making purposes.

SUMMARY

Limited, random, or sample matrix-specific influenced batch QC issues such as those discussed above, are a potential for any analysis. The number and types seen in these data sets are within expectations for the matrix types and analyses performed. The DQA review of the 116-H-5 waste site verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for 116-H-5 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. The analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in the Environmental Restoration (ENRE) project-specific database prior to being submitted for inclusion in the Hanford Environmental Information System (HEIS) database. The verification sample analytical data are also summarized in Appendix D.

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