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

13-AMRP-0169

APR 30 2013

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

Dear Ms. Hedges:

TRANSMITTAL OF APPROVED WASTE SITE RECLASSIFICATION FORMS AND SUPPORTING DOCUMENTATION FOR THE 100-N-6, 100-N-16, 100-N-98, and 128-N-1 WASTE SITES, REVISION 0

Attached for your use are the approved Waste Site Reclassification Form Nos. 2013-002, 2013-003, 2013-004, and 2013-005 and supporting documentation for the "100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites," Rev. 0. If you have questions, please contact me or your staff may contact Joanne Chance, of my staff, on (509) 376-0811.

Sincerely,

Mark S. French

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

AMRP:JCC

Attachment

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

cc w/o attach:
R. D. Cantwell, WCH
S. L. Feaster, WCH
T. Q. Howell, WCH
D. L. Plung, WCH
J. P. Shearer, CHPRC

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-002

Waste Site Code(s)/Subsite Code(s): 100-N-6; 128-N-1, 128N-FS-3 Waste Site

Reclassification Category: Interim ☒ Final ☐

Reclassification Status: Closed Out ☒ No Action ☐ Rejected ☐
RCRA Postclosure ☐ Consolidated ☐ None ☐

Approvals Needed: DOE ☒ Ecology ☒ EPA ☐

Description of current waste site condition:

The 100-N-6, 128-N-1, 128N-FS-3 waste site was identified as a 100-NR-1 Operable Unit waste site requiring remediation in the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N-Area ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 1999). This site was used to burn miscellaneous trash and debris, and is associated with the 100-N-16 and 128-N-1 waste sites, which are located adjacent to the 100-N-6 waste site, east of the 1120-N Building and south of the 116-N-3 waste site. Remedial action at the 100-N-6 waste site was performed between August 2010 and December 2012. A total volume of 26,256 bank cubic meters (34,342 bank cubic yards) of waste from the combined remediation of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites remediation was disposed at the Environmental Restoration Disposal Facility (ERDF). Verification sampling was performed to determine if the waste site meets the remedial action objectives and remedial action goals (RAGs) established by the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (RDR/RAWP), DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland, Washington (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). 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 ERDF, (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 results were evaluated in comparison to the remedial action goals (RAGs). In accordance with this evaluation, the verification sampling results support a reclassification of the 100-N-6 waste site to Interim Closed Out. The current site conditions achieve the RAGs established by the RDR/RAWP (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). The evaluation (which may include fate-and-transport modeling) of all data collected from the waste site resulted in a determination 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. Contamination above direct exposure levels was not observed in shallow zone soils and is concluded to not exist in deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites* (attached).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-002

Waste Site Code(s)/Subsite Code(s): 100-N-6; 128-N-1, 128N-FS-3 Waste Site

Regulator comments:

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:

J. P. Neath	J P Neath	4/9/13
DOE Federal Project Director (printed)	Signature	Date
N. Menard	Nina M. Menard	4/10/13
Ecology Project Manager (printed)	Signature	Date
N/A		
EPA Project Manager (printed)	Signature	Date

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-003

Waste Site Code(s)/Subsite Code(s): 100-N-16; Burn Pit 1, 128N-FS-2 Waste Site

Reclassification Category: Interim ☒ Final ☐

Reclassification Status: Closed Out ☒ No Action ☐ Rejected ☐
RCRA Postclosure ☐ Consolidated ☐ None ☐

Approvals Needed: DOE ☒ Ecology ☒ EPA ☐

Description of current waste site condition:

The 100-N-16; Burn Pit 1, 128N-FS-2 waste site was identified as a 100-NR-1 Operable Unit waste site requiring remediation in the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N-Area ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 1999). The waste site is located east of the 1120-N Building and south of the 116-N-3 waste site. Other burn pits, 128-N-1 and 100-N-6 are adjacent to the 100-N-16 waste site and were used for similar purposes. Remedial action at the 100-N-16 waste site was performed between August 2010 and December 2012. A total volume of 26,256 bank cubic meters (34,342 bank cubic yards) of waste from the combined remediation of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites remediation was disposed at the Environmental Restoration Disposal Facility (ERDF). Verification sampling was performed to determine if the waste site meets the remedial action objectives and remedial action goals (RAGs) established by the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (RDR/RAWP), DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland, Washington (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). 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 ERDF, (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 results were evaluated in comparison to the remedial action goals (RAGs). In accordance with this evaluation, the verification sampling results support a reclassification of the 100-N-16 waste site to Interim Closed Out. The current site conditions achieve the RAGs established by the RDR/RAWP (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). The evaluation (which may include fate-and-transport modeling) of all data collected from the waste site resulted in a determination 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. Contamination above direct exposure levels was not observed in shallow zone soils and is concluded to not exist in deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites* (attached).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-003

Waste Site Code(s)/Subsite Code(s): 100-N-16; Burn Pit 1, 128N-FS-2 Waste Site

Regulator comments:

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:

J. P. Neath		4/9/13
DOE Federal Project Director (printed)	Signature	Date
N. Menard		4/10/13
Ecology Project Manager (printed)	Signature	Date
N/A		
EPA Project Manager (printed)	Signature	Date

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-004

Waste Site Code(s)/Subsite Code(s): 100-N-98; 100-N Stain Area #3 Waste Site

Reclassification Category: Interim ☒ Final ☐

Reclassification Status: Closed Out ☒ No Action ☐ Rejected ☐
RCRA Postclosure ☐ Consolidated ☐ None ☐

Approvals Needed: DOE ☒ Ecology ☒ EPA ☐

Description of current waste site condition:

The 100-N-98, 100-N Stain Area #3 waste site is located in the 100-NR-1 Operable Unit, adjacent to the 100-N-6, 100-N-16, and 128-N-1 Burn Pits. This waste site was added to the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N-Area ROD) U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 1999) by the *Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington* (100-N-Area ESD) U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2011) as a candidate site that was subsequently recommended for remove, treat, and dispose (RTD). Remedial action at 100-N-98 waste site was performed between August 2010 and December 2012. A total volume of 26,256 bank cubic meters (34,342 bank cubic yards) of waste from the combined remediation of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites remediation was disposed at the Environmental Restoration Disposal Facility (ERDF). Verification sampling was performed to determine if the waste site meets the remedial action objectives and remedial action goals (RAGs) established by the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (RDR/RAWP), DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland, Washington (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). 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 ERDF, (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 results were evaluated in comparison to the remedial action goals (RAGs). In accordance with this evaluation, the verification sampling results support a reclassification of the 100-N-98 waste site to Interim Closed Out. The current site conditions achieve the RAGs established by the RDR/RAWP (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). The evaluation (which may include fate-and-transport modeling) of all data collected from the waste site resulted in a determination 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. Contamination above direct exposure levels was not observed in shallow zone soils and is concluded to not exist in deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites* (attached).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-004

Waste Site Code(s)/Subsite Code(s): 100-N-98; 100-N Stain Area #3 Waste Site

Regulator comments:

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:

J. P. Neath	J P Neath	4/9/13
DOE Federal Project Director (printed)	Signature	Date
N. Menard	Nina M. Menard	4/10/13
Ecology Project Manager (printed)	Signature	Date
N/A		
EPA Project Manager (printed)	Signature	Date

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-005

Waste Site Code(s)/Subsite Code(s): 128-N-1; 100-N Burning Pit, 128-N-1 Burning Pit Waste Site

Reclassification Category: Interim ☒ Final ☐

Reclassification Status: Closed Out ☒ No Action ☐ Rejected ☐
RCRA Postclosure ☐ Consolidated ☐ None ☐

Approvals Needed: DOE ☒ Ecology ☒ EPA ☐

Description of current waste site condition:

The 128-N-1, 100-N Burning Pit, 128-N-1 Burning pit was identified as a 100-NR-1 Operable Unit waste site requiring remediation in the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N-Area ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 1999). The waste site is located approximately 460 m (1,500 ft) northeast of the 1120-N Building, and is south of the 116-N-3 waste site. The 128-N-1 waste site is surrounded by other burn pits, including 100-N-6, 100-N-16, and 100-N-98. Combustible materials, such as nuisance vegetation and combustible wastes, such as office waste, tools, hardware, and, potentially, paints and solvents, have been burned at this site. Remedial action at the 128-N-1 waste site was performed between August 2010 and December 2012. A total volume of 26,256 bank cubic meters (34,342 bank cubic yards) of waste from the combined remediation of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites remediation was disposed at the Environmental Restoration Disposal Facility (ERDF). Verification sampling was performed to determine if the waste site meets the remedial action objectives and remedial action goals (RAGs) established by the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (RDR/RAWP), DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland, Washington (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). 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 ERDF, (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 results were evaluated in comparison to the remedial action goals (RAGs). In accordance with this evaluation, the verification sampling results support a reclassification of the 128-N-1 waste site to Interim Closed Out. The current site conditions achieve the RAGs established by the RDR/RAWP (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). The evaluation (which may include fate-and-transport modeling) of all data collected from the waste site resulted in a determination 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. Contamination above direct exposure levels was not observed in shallow zone soils and is concluded to not exist in deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites* (attached).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2013-005

Waste Site Code(s)/Subsite Code(s): 128-N-1; 100-N Burning Pit, 128-N-1 Burning Pit Waste Site

Regulator comments:

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:

J. P. Neath	J P Neath	4/9/13
DOE Federal Project Director (printed)	Signature	Date
N. Menard	Nina M. Menard	4/10/13
Ecology Project Manager (printed)	Signature	Date
N/A		
EPA Project Manager (printed)	Signature	Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-N-6, 100-N-16, 100-N-98, AND 128-N-1 WASTE SITES

Attachment to Waste Site Reclassification Forms 2013-002, 2013-003, 2013-004, and 2013-005

April 2013

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-N-6, 100-N-16, 100-N-98, AND 128-N-1 WASTE SITES

EXECUTIVE SUMMARY

The 100-N-6, 128-N-1, 128N-FS-3; 100-N-16 Burn Pit 1, 128N-FS-2; 100-N-98, 100-N Stain Area #3; and 128-N-1, 100-N Burning Pit, 128-N-1 Burning Pit waste sites are located in the 100-NR-1 Operable Unit, within the same geographical area. The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites historical processes were associated with waste disposal and burning. Combustible materials, such as nuisance vegetation, office waste, tools and hardware were disposed within the bounds of these waste sites and burned. In addition, historical processes indicated a potential disposal of paints and solvents at these waste sites.

Remedial action at the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste site was performed between August 2010 and December 2012. During waste site remediation, materials such as burned wood, metal, asbestos, glass, miscellaneous construction debris, paints, solvents, drums with solvents and oils, roofing tar, bottle and bunker oil were observed at these waste sites. A total of approximately 20,334 bank cubic meters (BCM) (26,596 bank cubic yards [BCY]) were excavated and staged for removal to the Environmental Restoration Disposal Facility (ERDF). The 100-N-98 area 1 was remediated within the 100-N-6, 100-N-16 and 128-N-1 excavation. Between April 16 and 19, 2012, the excavation was expanded to the west to include stained soil area 2 of the 100-N-98 waste site. Approximately 476 BCM (623 BCY) of soil was removed from 100-N-98 area 2 and direct loaded for disposal at ERDF. Excavation continued until all debris and contamination associated with the waste site had been removed. No radiologically contaminated material was discovered during remediation activities.

Verification sampling at the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites excavation was performed on July 25, 2012. Verification sampling results indicated two sample locations EXC-9 (sample J1PW14) and FS-4 (sample J1PW37) exceeded direct exposure remedial action goals (RAGs) for polycyclic aromatic hydrocarbons (PAH). Location EXC-13 (sample J1PW18), exceeded direct exposure RAGs for semivolatile organic compounds (SVOCs). Additional remediation was performed between October 2 and 30, 2012, to remove additional contaminated soils at sample locations EXC-13, EXC-9 and FS-4. Verification resampling at these locations followed on October 31, 2012.

Based on the available in-process data, the staging pile area (SPA) required additional remediation; therefore, the SPA was not sampled concurrently with the excavation. Additional remediation of the SPA was performed between October 2 and 30, 2012. The SPA verification sampling was performed on November 13, 2012. Verification sampling results indicated that one sample location, SPA-11 exceeded direct exposure RAGs for benzo(a)pyrene. Additional remediation of the staging pile area was performed on December 13, 2012, and location SPA-11 was re-sampled.

The additional remediation of the SPA and the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites, generated an additional volume of 5,446 BCM (7,123 BCY) of material for direct

load out to ERDF. A total volume of 26,256 BCM (34,342 BCY) was disposed at ERDF, to complete the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste site remediation. No radiologically contaminated material was discovered during remediation activities.

A reclassification of Interim Closed Out for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites is supported based on the final verification sampling results. The current site conditions achieve the remedial action objectives and the corresponding RAGs established in the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (DOE-RL 2006b) and the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N Area ROD) (EPA 1999). A summary of the cleanup evaluation for the soil results against the applicable criteria is presented in Table ES-1.

Table ES-1. Summary of Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98 Waste Sites. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain dose rate of <15 mrem/yr above background over 1,000 years.	Radionuclides were not COPCs for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites.	N/A
Direct Exposure – Nonradionuclides	Attain individual COPC RAGs.	All individual COPC concentrations are below the direct exposure criteria.	Yes
Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	All hazard quotients for individual nonradionuclide COPCs are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The direct exposure cumulative hazard quotient (6.1×10^{-2}) is <1.	
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	All excess cancer risk for individual carcinogens is $<1 \times 10^{-6}$.	
	Attain a cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The direct exposure total excess cancer risk (1.2×10^{-6}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single-COPC groundwater and river protection RAGs.	Radionuclides were not COPCs for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites.	Yes
	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 100-N-6, 100-N-16, 100-N-98 Waste Sites. (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 total chromium, copper, lead, nickel, aroclor-1254, aroclor-1260, total PCBs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene exceeded the soil RAGs for the protection of groundwater and/or the Columbia River. However, it is predicted that these constituents will not migrate to groundwater (and thus the Columbia River) at concentrations exceeding groundwater or river protection criteria within 1,000 years. Therefore, residual concentrations achieve the remedial action objectives for groundwater and river protection [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 the RESidual Radioactivity modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2006b) residual concentrations of total chromium, copper, lead, nickel, aroclor-1254, aroclor-1260, total PCBs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene are not predicted to migrate more than 3.0 m (9.8 ft) vertically in 1,000 years (based on the lowest distribution coefficient of the contaminants [copper] of 22 mL/g). The vadose zone underlying the excavation is approximately 18 m (59 ft) thick. Therefore, residual concentrations of these contaminants 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
PCB = polychlorinated biphenyl
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100-N Area*

The results of the verification sampling are used to make reclassification decisions for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites in accordance with the TPA-MP-14 procedure in the *Tri-Party Agreement Handbook Management Procedures* (DOE-RL 2011b). In accordance with this evaluation, the verification sampling results support a reclassification of these waste sites to Interim Closed Out. 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. Site contamination above direct exposure levels was not observed in shallow zone soils and is concluded not to exist in deep zone soils (i.e., below 4.6 m [15 ft]); therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

Soil cleanup levels were established in the 100-N Area ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the 100-N Area ROD (EPA 1999), a comparison against ecological risk screening levels has been made for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites contaminants of potential concern and other constituents (see Appendix A). The U.S. Environmental Protection Agency ecological soil screening levels were exceeded for copper, lead, manganese, selenium, vanadium, and zinc. Ecological screening levels from the *Washington Administrative Code* 173-340 were exceeded for boron, copper, selenium, 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 manganese, vanadium, and zinc are below Hanford Site or Washington State background values (note that Washington 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 ecological effects as a part of the final closeout decision for the Columbia River corridor portion of the Hanford Site.

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-N-6, 100-N-16, 100-N-98, AND 128-N-1 WASTE SITES

STATEMENT OF PROTECTIVENESS

The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites verification sampling data demonstrate that this site meets the objectives established in the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (RDR/RAWP) (DOE-RL 2006b) and the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N Area ROD) (EPA 1999). These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

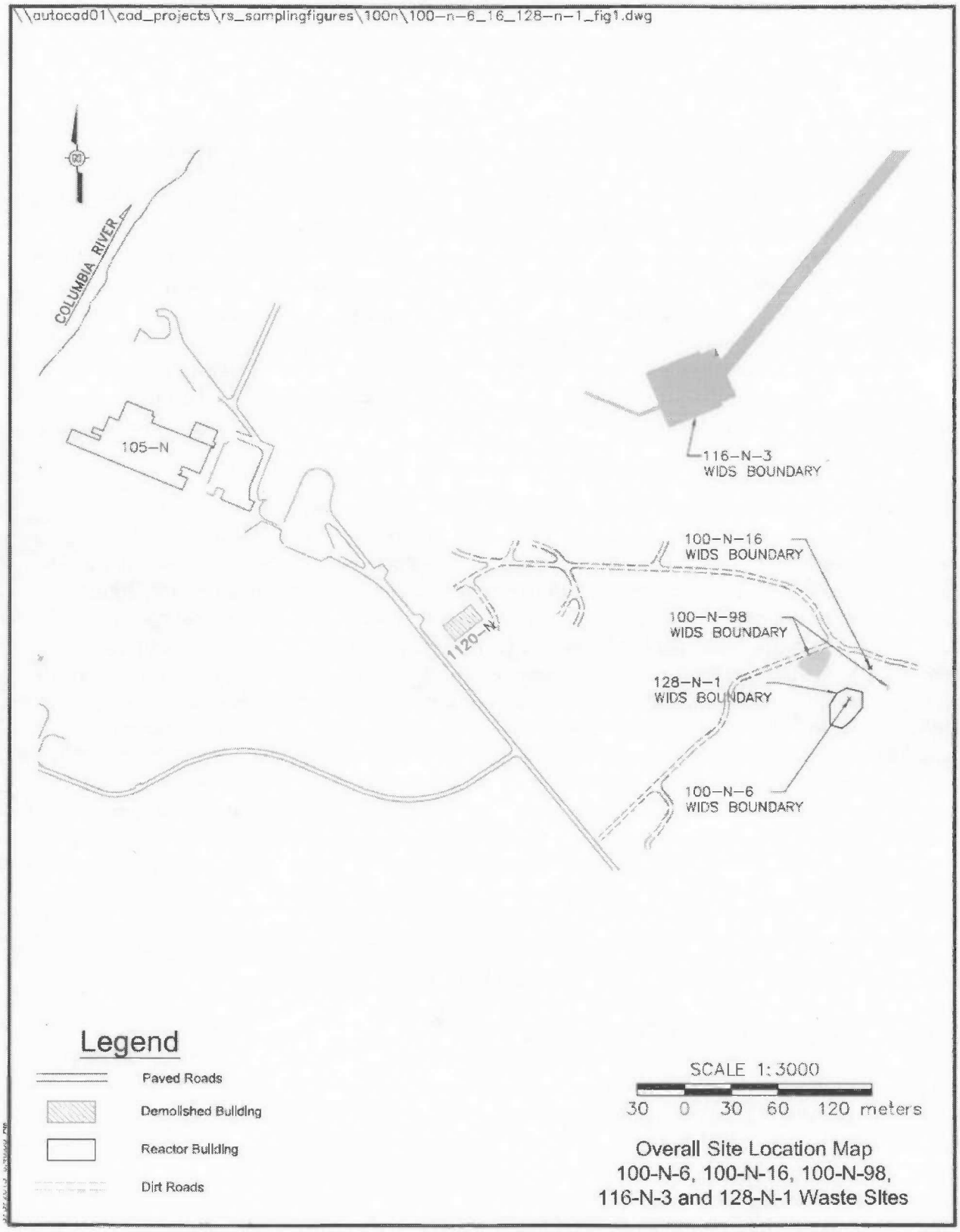
Soil cleanup levels were established in the 100-N Area ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the 100-N Area ROD (EPA 1999), a comparison against ecological risk screening levels has been made for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites contaminants of potential concern (COPCs) and other constituents (see Appendix A). The U.S. Environmental Protection Agency ecological soil screening levels were exceeded for copper, lead, manganese, selenium, vanadium, and zinc. Ecological screening levels from the *Washington Administrative Code* 173-340 were exceeded for boron, copper, selenium, 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 manganese, vanadium, and zinc are below Hanford Site or Washington State background values (note that Washington 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 ecological effects as a part of the final closeout decision for the Columbia River corridor portion of the Hanford Site.

GENERAL SITE INFORMATION AND BACKGROUND

128-N-1, 100-N-6, and 100-N-16 Burn Pits

According to the *100-N Area Technical Baseline Report* (WHC 1994), the 128-N-1, 100-N Burning Pit is located approximately 457 m (1,500 ft) northeast of the 1120-N Building and southeast of the 116-N-3 waste site (Figure 1). The burning pit operated from 1963 to 1989. It was primarily used to burn nonhazardous waste such as paper, wood, trash, etc. Other combustible materials such as nuisance vegetation, office wastes, tools, hardware, and possibly paints and solvents have been burned at this site.

Figure 1. The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Location Map.



Since the early 1970s with the establishment of the Hanford Central Landfill, the 128-N-1 burning pit has only been used to burn nuisance vegetation. Much of the site had been backfilled with clean material (WHC 1994).

The 100-N-6 and 100-N-16 waste sites are associated with the 128-N-1 waste site (Figure 1). The 100-N-6 waste site is located within the same general area as the 128-N-1 waste site, and was used to burn miscellaneous trash and debris. During a walkdown in 1994, it was noted that the site appeared to have been leveled and scraped. The 100-N-16 waste site is located immediately north of 128-N-1 and 100-N-6 waste sites and consisted of an 18- by 18-m (59- by 59-ft) semi-cleared circular area. Ash was evident on the surface, and the area was covered with broken glass, wire, coil, pipe, tin cans, metal, and other burned debris.

A geophysical investigation was conducted on June 28, 2007, at the 100-N-6, 100-N-16, and 128-N-1 waste site locations. An approximate limit of buried debris was identified, as shown in Figure 2.

The 100-N-98 Waste Site

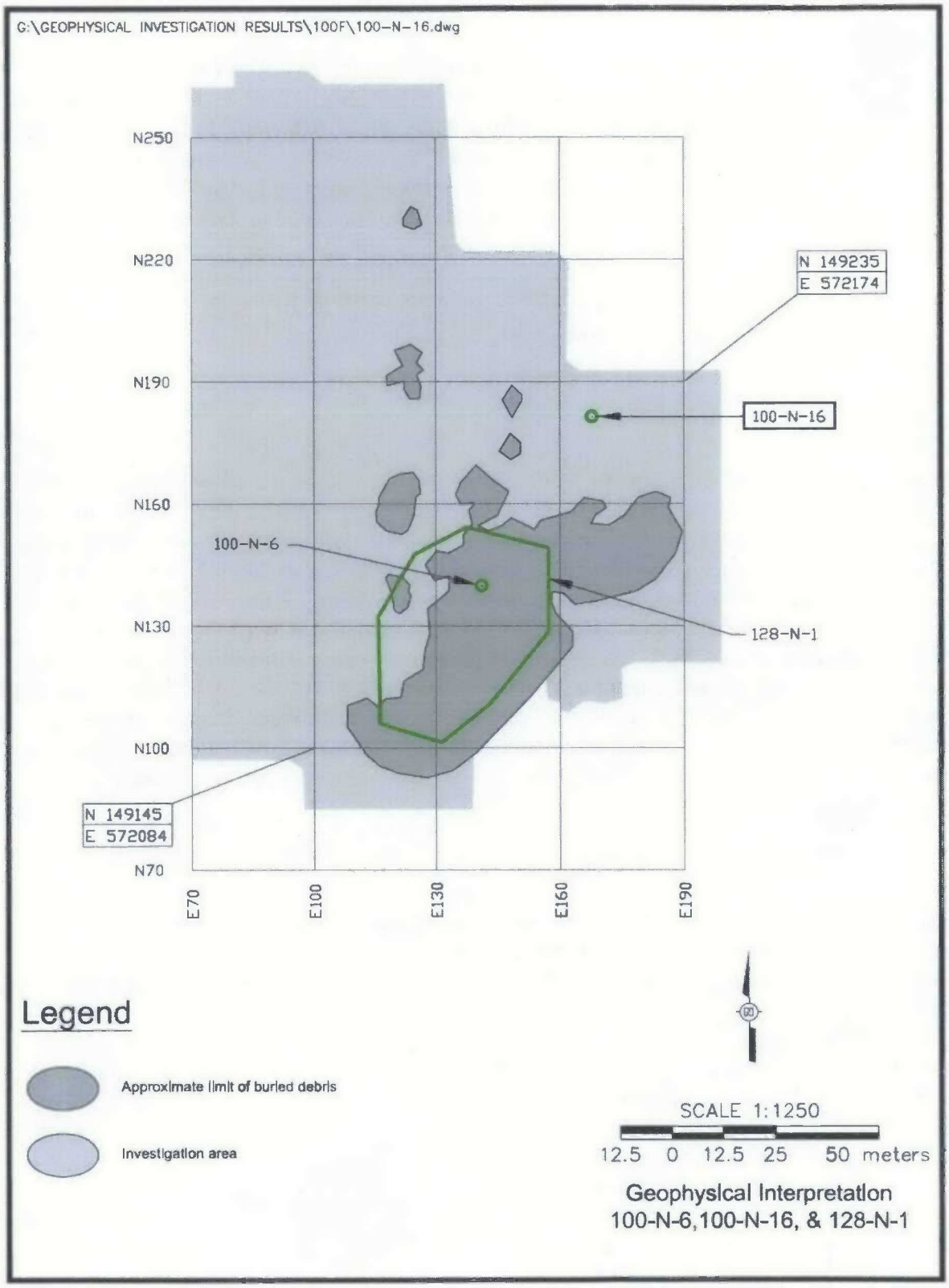
There are no known historical processes that were associated with the 100-N-98 waste site. The site is classified as a dumping area and may have been associated with the processes of burn pits 100-N-6, 100-N-16 and 128-N-1 located near the 100-N-98 waste site. The 100-N-98 waste site consisted of two locations in the 100-NR-1 Operable Unit near the 128-N-1 Burn Pit where stained surface soil with no vegetation was observed. Location 1 is approximately 33 m (108.3 ft) northwest of the 128-N-1 Burning Pit, and is centered at Washington State Plane (WSP) coordinates N 149231.7, E 572079.8. Location 2 is approximately 34 m (111.5 ft) northeast of 128-N-1 and is centered at WSP coordinates N 149199.4, E 572174.5 (Figure 1). Remedial activities of 100-N-6, 100-N-16, and 128-N-1 extended remedial boundaries in order to encompass all contamination associated with the 100-N-98 waste site and remediate both locations.

REMEDIAL ACTION SUMMARY

Remediation of 100-N-6, 100-N-16, 100-N-98 area 1, and 128-N-1 waste sites began on August 2, 2010, and was completed on November 28, 2011. A total of approximately 20,334 bank cubic meters (BCM) (26,596 bank cubic yards [BCY]) were excavated and staged for removal to the Environmental Restoration Disposal Facility (ERDF). Between April 16 and 19, 2012, the excavation was expanded to the west to include stained soil area 2 of the 100-N 98 waste site. Approximately 476 BCM (623 BCY) of soil was removed from 100-N-98 area 2 and direct loaded for disposal at ERDF.

The materials removed from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites consisted of abandoned wiring, transite pipe, metallic and wood debris, burnt wood, ash, tar, roofing felt, stained soil, a bucket of grout, an open glass bottle, green fibrous material, purple sandy material, a paint ball, drums containing bunker and amber oil, and miscellaneous demolition debris. The in-process sample results are included in Appendix B.

Figure 2. The 100-N-6, 100-N-16, and 128-N-1 Waste Sites Geophysical Interpretation Map.



Photographs of miscellaneous materials excavated during the remediation of 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites are included in Appendix C.

In-process soil samples were collected from within the excavation. Some of these in-process samples had elevated levels of metals, TPH, and organics. Additional remediation was performed following these sample results. The in-process soil sample results are presented in Appendix B.

Verification sampling at the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites excavation was performed on July 25, 2012. Verification sampling results indicated two sample locations, EXC-9 (sample J1PW14) and FS-4 (sample J1PW37), that exceeded direct exposure remedial action goals (RAGs) for polycyclic aromatic hydrocarbons (PAH). Location EXC-13 (sample J1PW18), exceeded direct exposure RAGs for semivolatile organic compounds (SVOCs). Per the regulatory agreement *128-N-1 Additional Remediation Proposal*, additional remediation was performed between October 2 and 30, 2012 to remove additional contaminated soils at sample locations EXC-13, EXC-9, and FS-4 (Ecology 2012). Verification resampling at these locations followed on October 31, 2012.

Based on the available in-process data, the staging pile area (SPA) required additional remediation; therefore, the SPA was not sampled concurrently with the excavation. Additional remediation of the SPA was performed between October 2 and 30, 2012. The SPA verification sampling was performed on November 13, 2012. Verification sampling results indicated that one sample location, SPA-11 exceeded direct exposure RAGs for benzo(a)pyrene. Per the regulatory agreement "128-N-1 Staging Pile Area Plume Chase Request," additional remediation of the staging pile area was performed on December 13, 2012, and location SPA-11 was resampled (DOE-RL 2012).

The additional remediation of the SPA and the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste site excavation generated an additional volume of 5,446 BCM (7,123 BCY) of material for direct load out to ERDF. A total volume of 26,256 BCM (34,342 BCY) was disposed at ERDF, to complete the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste site remediation. A photograph of site conditions on December 12, 2012, is included in Figure 3. An overlay of the geophysical interpretation survey and excavation walkaround boundaries is included in Figure 4. A post-excavation civil survey is provided in Figure 5.

ANOMALIES

Anomalous material discovered during remediation included six 208-L (55-gal) drums, small white ceramic balls used as filtering media, and soil with a strong solvent odor. A brief description for each anomalous item is included in Table 1. All anomalous items were removed and staged at the anomaly staging area located within the staging pile area. Additional remediation was performed in the areas where anomalous items were present and all soils were direct loaded for disposal at ERDF.

Figure 3. Aerial Photograph of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Excavation and Staging Pile Area (December 12, 2012).

Figure 4. Geophysical Survey Overlain on the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Excavation Boundary Walkaround.

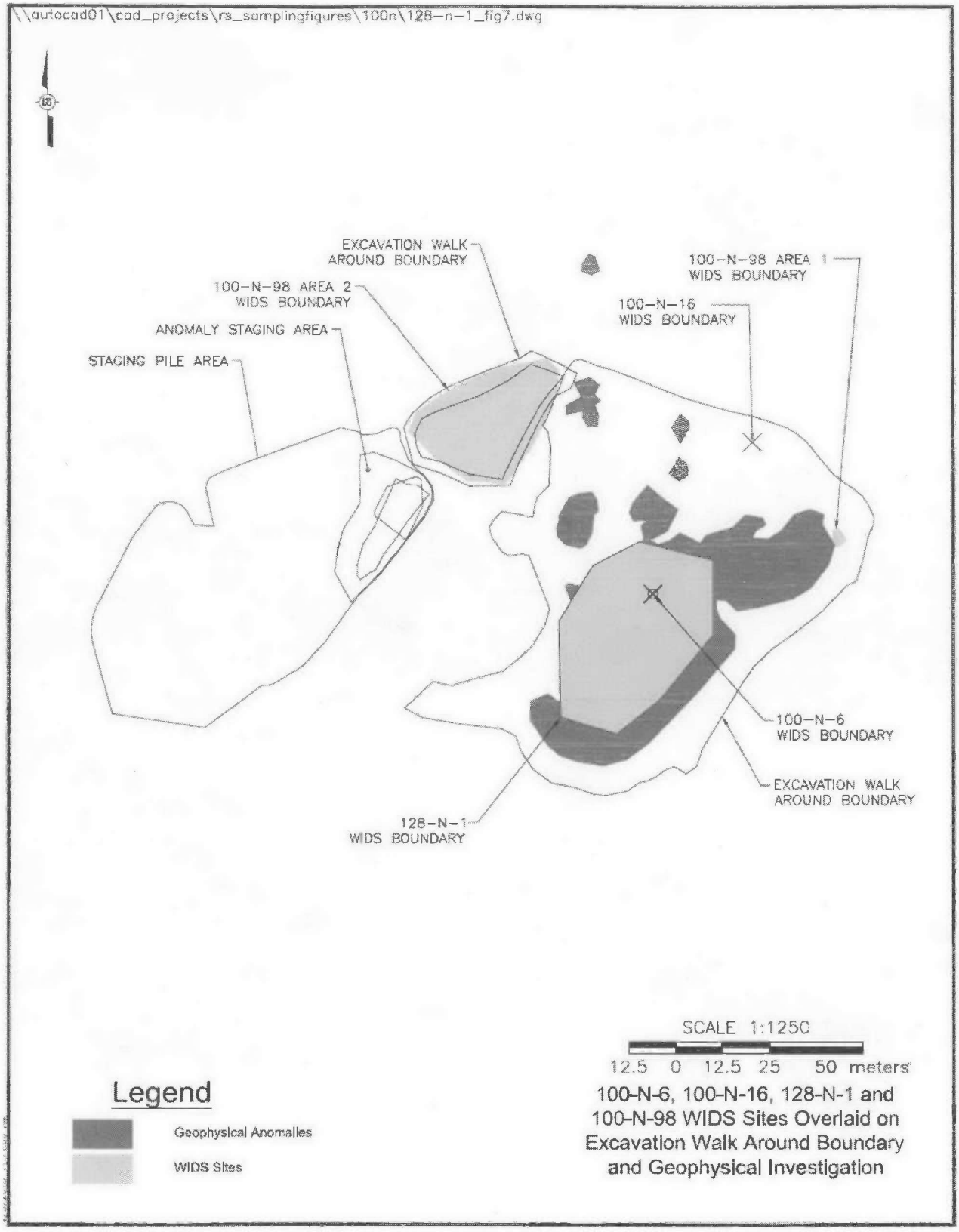


Figure 5. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Post-Excavation Civil Survey.

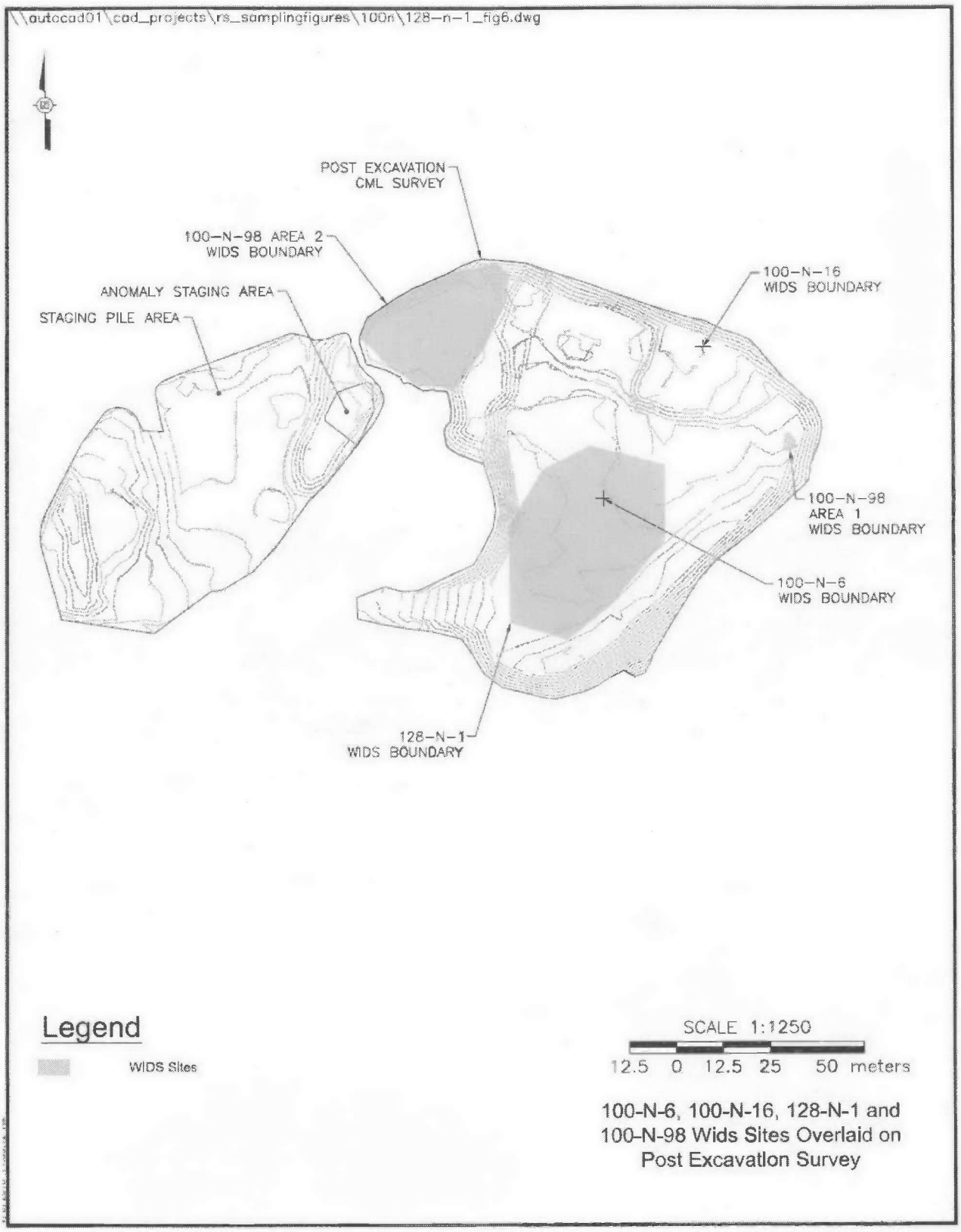


Table 1. Anomalies Discovered at the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites.

Anomaly Number	Brief Description	Discovery Date	Sample number	Northing	Easting
100N-ENV-10-006	208-L (55-gal) barrel with black burnt rubber roofing, tar-matte finished	11/16/2010	J1CP25	149187	572119
100N-ENV-10-007	208-L (55-gal) barrel with black powder (graphite/charcoal), filter material	12/2/2010	J1CXP9	149188	572124
100N-ENV-10-008	208-L (55-gal) drum with black oily tar blobs, shiny	12/6/2010	J1CYO8	149192	572126
100N-ENV-10-009	Small white ceramic balls, filtering material	12/6/2010	J1CXY0	149194	572128
100N-AN-10-005	208-L (55-gal) rusty drum compromised leaking liquid with petro solvent odor	11/29/2010	J1CXN7	149184	572112
100N-AN-10-006	208-L (55-gal) drum with amber colored liquid (spill on ground)	12/6/2010	J1CY07	149189	572112
100N-AN-10-007	208-L (55-gal) drum with black thick oily liquid, bunker oil odor, petro/solvent	12/6/2010	J1CXX6	149193	572124
100N-AN-10-008	Soil with strong petro/solvent odor, PID 1.0 ppm VOC s	12/13/2010	NA	149198	572116

NA = not applicable
PID = photoionization detector
ppm = parts per million
VOC = volatile organic compound

All of the anomalies listed in Table 1 were concentrated near the center of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites excavation. Three focused verification samples were collected from the area where significant accumulation of anomalous items was present. An additional focused sample (FS-4) was collected from an area where two drums containing bunker oil and amber oil were found.

The inner area between the 100-N-98 and 100-N-6, 100-N-16, and 128-N-1 excavations is included in the verification sampling design as part of the excavation because this edge of the excavation was used for temporary placement of lead contaminated soils and drums on a plastic barrier.

The 100N-AN-11-001 anomaly was temporarily relocated to the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites staging area from the UPR-100-N-19 waste site. The 100N-AN-11-001 anomaly is not associated with this group of sites and was transferred to the staging area for characterization purposes only. The anomaly was stored on a plastic-lined area, precluding any potential contaminants from reaching the soil.

Radiological Survey

The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites are not associated with any radiological contaminant sources or radiological operational processes. However, post-excavation radiological gamma surveys were conducted at the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 excavation and staging pile area prior to additional excavation expansion for the 100-N-98 waste site remediation. The GPERS survey results for the excavation and the staging pile area are included in Figures 6 and 7, and do not indicate the presence of radiological contamination. No additional post-excavation radiological surveys were conducted after the 100-N-98 waste site excavation was completed because radiological constituents are not COPCs for this group of sites.

VERIFICATION SAMPLING ACTIVITIES

Initial verification sampling for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites excavation area was performed on July 25 and November 13, 2012. The analytical data results indicated that additional remediation was required at three sample locations (EXC-13, EXC-9, and FS-4) within the excavation, and one sample location (SPA-11) within the SPA. Following additional remediation, excavation sample locations EXC-13, EXC-9 and FS-4 were re-sampled on October 31, 2012, and staging pile area location (SPA-11) was re-sampled on December 13, 2012. These samples were collected to support a determination that residual contaminant concentrations at this site meet the cleanup criteria specified in the 100-N Area RDR/RAWP (DOE-RL 2006b) and the 100-N Area ROD (EPA 1999). The verification sample results are provided in Appendix D. The following subsections provide 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 *Work Instruction for Verification Sampling of the 100-N-6,128-N-1; 128N-F8-3, 100-N-16, 128-M-FS-2; Burn Pit 1, 100-N-98, 100-N Stain Area #3, 128-N-1Burning Pit; 100-N Burning Pit Waste Sites* (WCH 2012a).

Contaminants of Potential Concern

The COPCs for the 100-N-6, 100-N-16, and 128-N-1 burn pit waste sites are listed in the 100-N Area RDR/RAWP (DOE RL 2006b). The COPCs listed for the 100-N-6 and 100-N-16 waste sites include metals, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), and volatile organic compounds (VOCs). The COPCs for 128-N-1 are associated with miscellaneous trash and debris, including paints and solvents. The 100-N-98 stain area waste site is included in the *Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Action Record of Decision, Hanford Site, Benton County, Washington* (EPA 2011). The potential contamination at the 100-N-98 waste site includes chemical contaminants. Based on the in-process sample results and the fact that the 100-N-6, 100-N-16 and 100-N-98, and 128-N-1 waste sites occupy the same general area and share one excavation, the cumulative list of COPCs includes metals, mercury, PAH, SVOCs, VOCs, PCBs, and TPH. Radionuclides are not identified as COPCs for these waste sites.

Figure 6. GPERS Survey of 100-N-6, 100-N-16, and 128-N-1 Excavation Gamma Track Map.

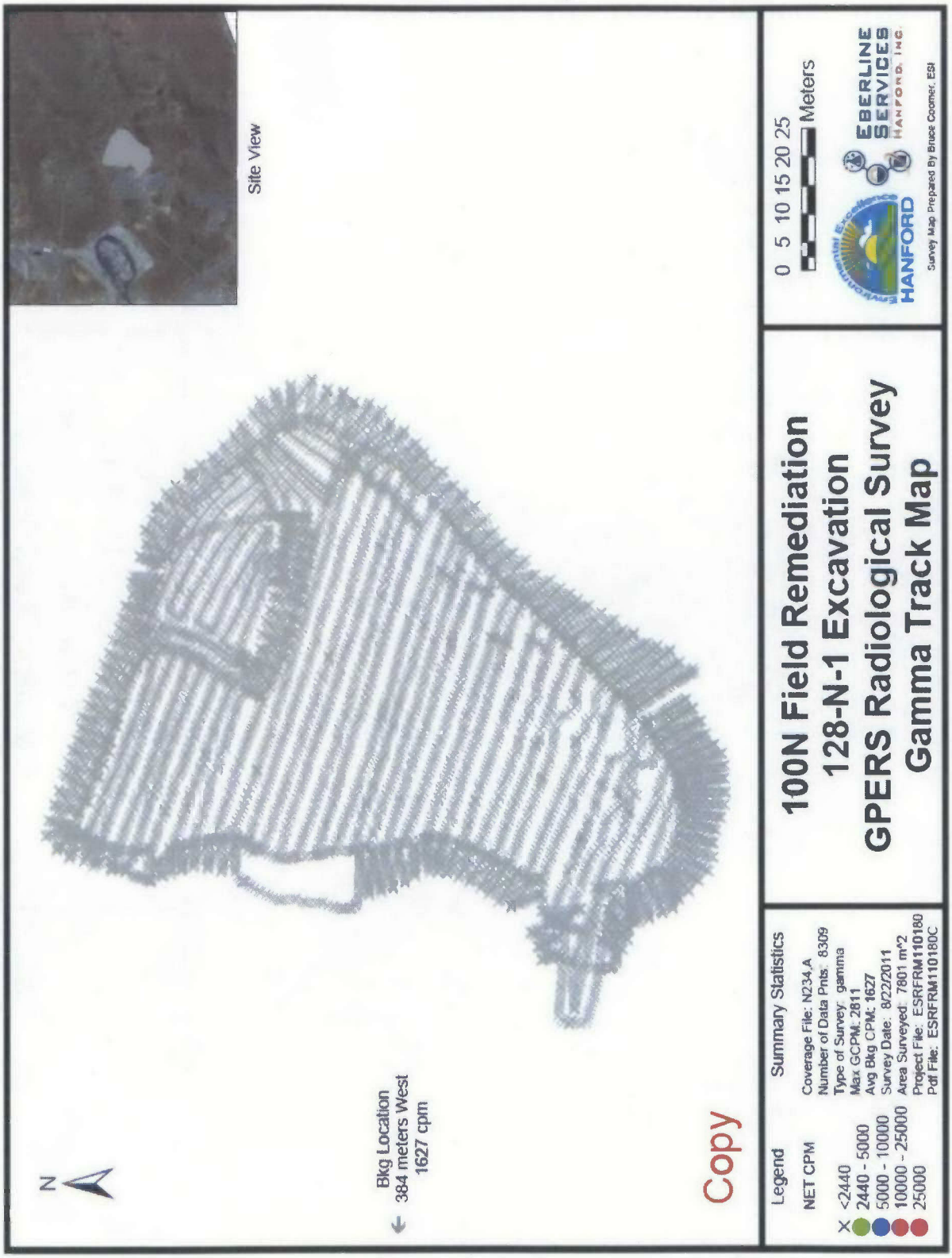
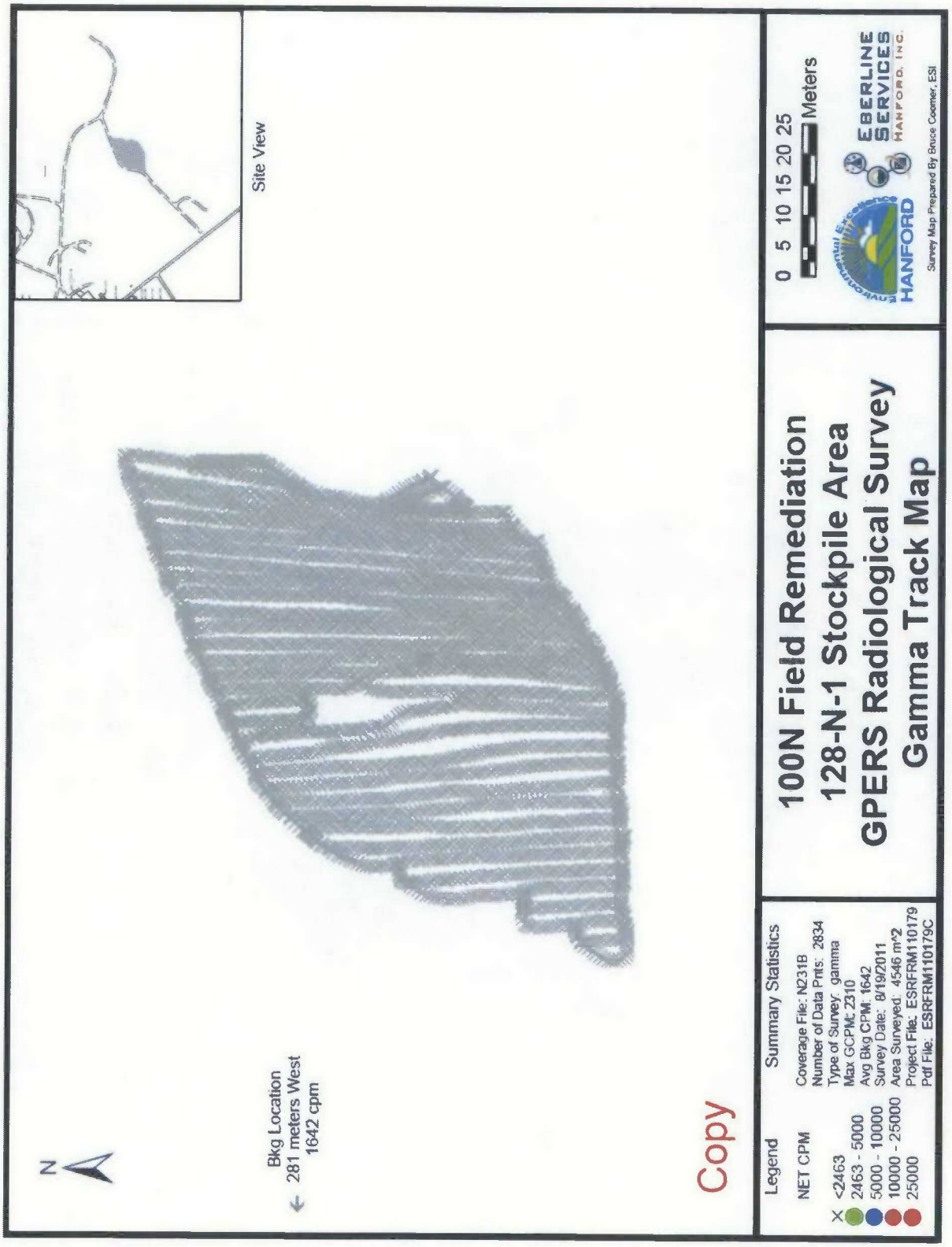


Figure 7. GPERS Survey of 100-N-6, 100-N-16, and 128-N-1 Staging Pile Area Gamma Track Map.



A summary of all the contaminants analyzed is provided in Table 2.

Table 2. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Laboratory Analytical Methods and Contaminants of Potential Concern.

Analysis	Analytical Method	Contaminant of Potential Concern
ICP metals [a]	EPA Method 6010	ICP metals
Mercury	EPA Method 7471	Mercury
PCB	EPA Method 8082	Polychlorinated biphenyls
SVOA [b]	EPA Method 8270	Semivolatile organic compounds
PAH [b]	EPA Method 8310	Polycyclic aromatic hydrocarbons
TPH	EPA Method NWTPH-Dx	Total petroleum hydrocarbons
VOA	EPA Method 8260	Volatile organic compounds

[a] Analysis was performed for the expanded list of ICP metals to include antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

[b] Because method 8310 is specific to PAH analysis, data from this method was used preferentially over the 8270 data for site evaluation of the PAH analytes.

EPA = U.S. Environmental Protection Agency
ICP = inductively coupled plasma
NWTPH-Dx = Northwest total petroleum hydrocarbons-diesel range organics
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
VOA = volatile organic analysis

Verification Sample Design

Two decision units were identified for verification sampling of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites, one for the excavation footprint and one for the staging pile area. A total of 13 statistical verification soil samples were collected from the excavation area and 12 statistical verification soil samples were collected from the staging pile area. Additionally, four focused samples were collected from locations where anomalies were discovered and/or found to be accumulated. All samples were collected as discrete grabs. All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the *100-N Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2006a). Verification sampling is documented in the field sampling logbooks (WCH 2012b, WCH 2012c, and WCH 2012d).

The verification samples are listed in Table 3, and sample locations are shown in Figures 8 through 11.

Table 3. The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Summary Table. (2 Pages)

Sample Location	HEIS Sample Number	WSP Northing (m)	WSP Easting (m)	Sample Analysis [a]
EXC-1	J1PW06	149212.9	572166.2	ICP metals [a], mercury, PCBs, SVOAs, PAH [b], TPH, VOA
EXC-2	J1PW07	149230.9	572142.6	
EXC-3	J1PW08	149183.5	572162.4	
EXC-4	J1PW09	149201.5	572138.8	
EXC-5	J1PW10	149219.5	572115.3	
EXC-6	J1PW11	149237.4	572091.7	
EXC-7	J1PW12	149172.1	572135.1	
EXC-8	J1PW13	149190.1	572111.5	
EXC-9	J1PW14	149208.1	572088.0	
EXC-9 Resample	J1R505	149208.1	572088.0	PAH [b]
EXC-10	J1PW15	149226.0	572064.4	ICP metals [a], mercury, PCBs, SVOAs, PAH [b], TPH, VOA
EXC-11	J1PW16	149142.8	572131.3	
EXC-12	J1PW17	149160.7	572107.7	
EXC-13	J1PW18	149149.3	572080.4	
EXC-13 Resample	J1R506	149149.3	572080.4	SVOAs
Duplicate of J1PW11 [c]	J1PW19	149237.4	572091.7	ICP metals [a], mercury, PCBs, SVOAs, PAH [b], TPH, VOA
SPA-1	J1PW20	149154.7	571989.3	ICP metals [a], mercury, PCBs, SVOAs, PAH [b], TPH, VOA
SPA-2	J1PW21	149154.7	572010.2	
SPA-3	J1PW22	149172.8	571978.8	
SPA-4	J1PW23	149172.8	571999.7	
SPA-5	J1PW24	149172.8	572020.7	
SPA-6	J1PW25	149190.9	571989.3	
SPA-7	J1PW26	149190.9	572010.2	
SPA-8	J1PW27	149190.9	572031.1	
SPA-9	J1PW28	149209.1	572020.7	
SPA-10	J1PW29	149209.1	572041.6	
SPA-11	J1PW30	149209.1	572062.5	
SPA-11 Resample	J1R794	149209.1	572062.5	SVOAs, PAH [b]
SPA-12	J1PW31	149227.2	572052.1	ICP metals [a], mercury, PCBs, SVOAs, PAH [b], TPH, VOA
Duplicate of J1PW25 [c]	J1PW32	149190.9	571989.3	

Table 3. The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Summary Table. (2 Pages)

Sample Location	HEIS Sample Number	WSP Northing (m)	WSP Easting (m)	Sample Analysis [a]
FS-1	J1PW34	149184.1	572112.3	ICP metals [a], mercury, PCBs, SVOAs, PAH [b], TPH, VOA
FS-2	J1PW35	149193.0	572124.7	
FS-3	J1PW36	149187.1	572119.2	
FS-4	J1PW37	149243.3	572100.2	
FS-4 Resample	J1R507	149243.3	572100.2	PAH [b]
Equipment blank	J1PW33	NA	NA	ICP metals, mercury, SVOAs
Trip blank	J1R5M1	NA	NA	VOA

[a] The expanded list of ICP metals included antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

[b] Because method 8310 is specific to PAH analysis, data from this method was used preferentially over the 8270 data for site evaluation of the PAH analytes.

[c] The duplicate sample location was selected at the discretion of the project analytical lead.

EXC = Excavation
FS = Focused Sample
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
SPA = Staging Pile Area
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons – diesel range organics
VOA = volatile organic analysis
WSP = Washington State Plane coordinate

Figure 8. Verification Sample Locations for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites.

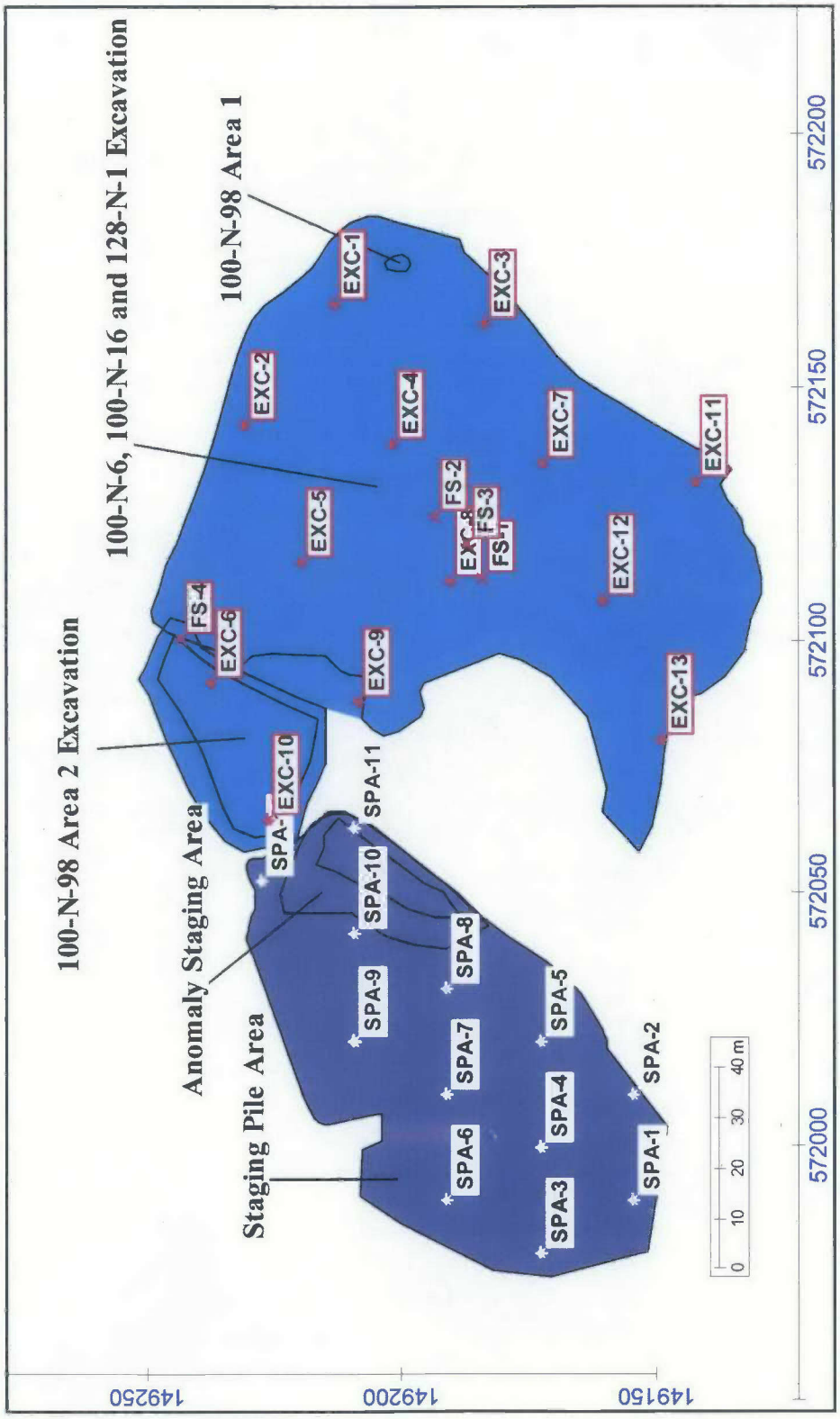


Figure 9. Verification Sample Locations for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Staging Pile Areas.

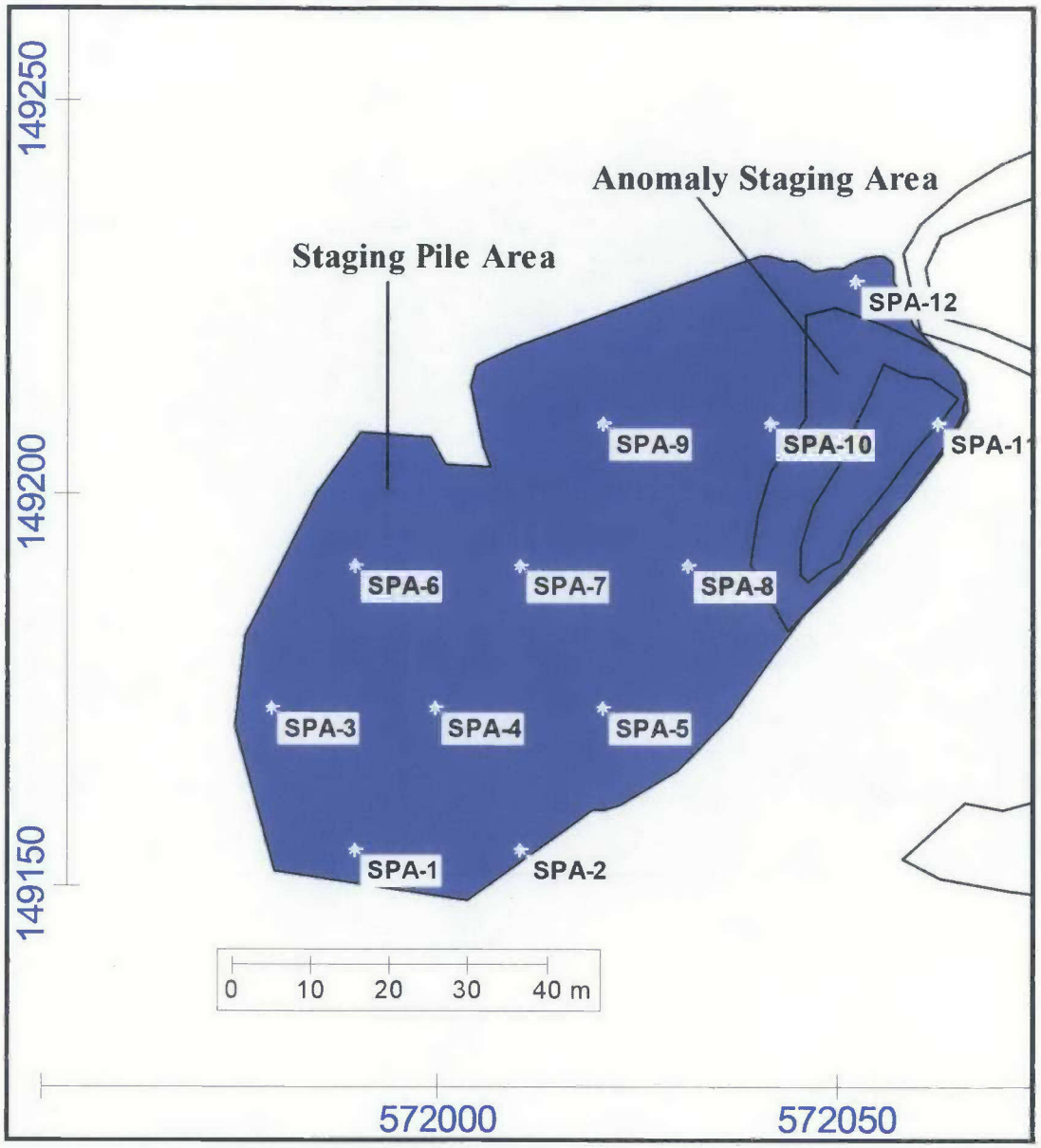


Figure 10. Verification Sample Locations for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Excavation.

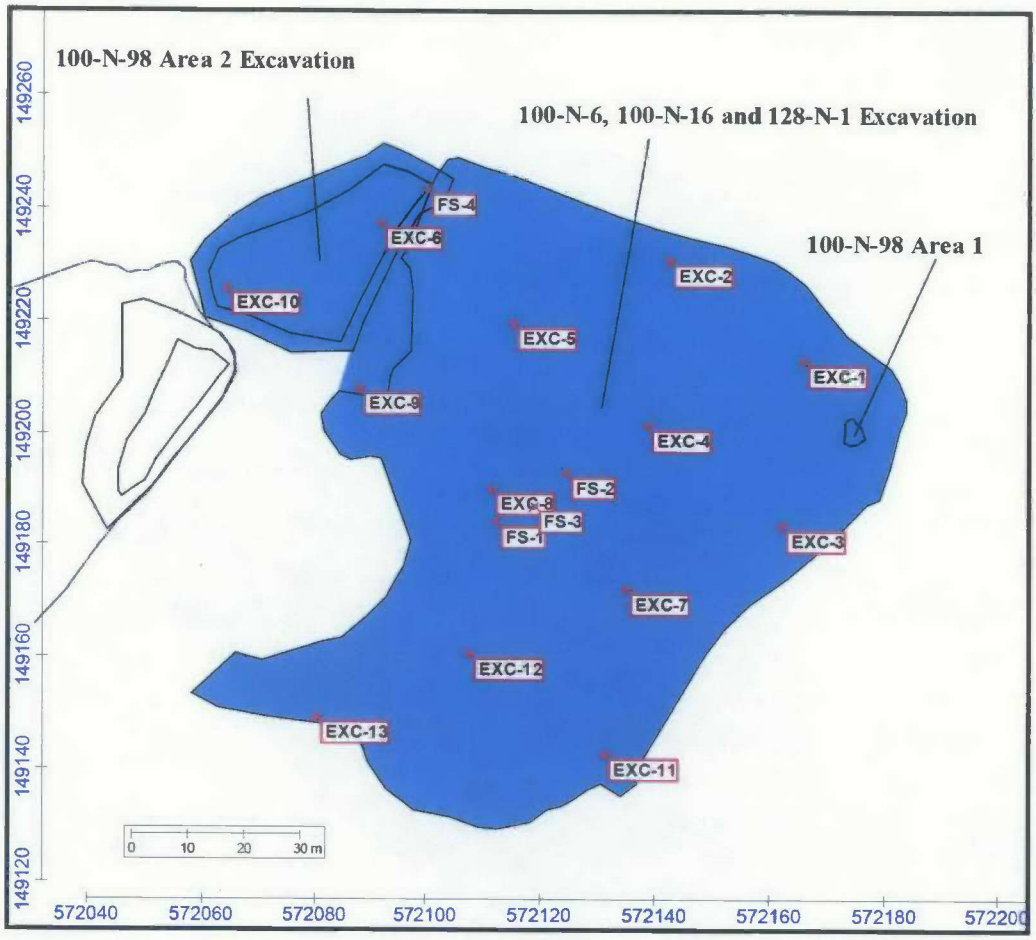
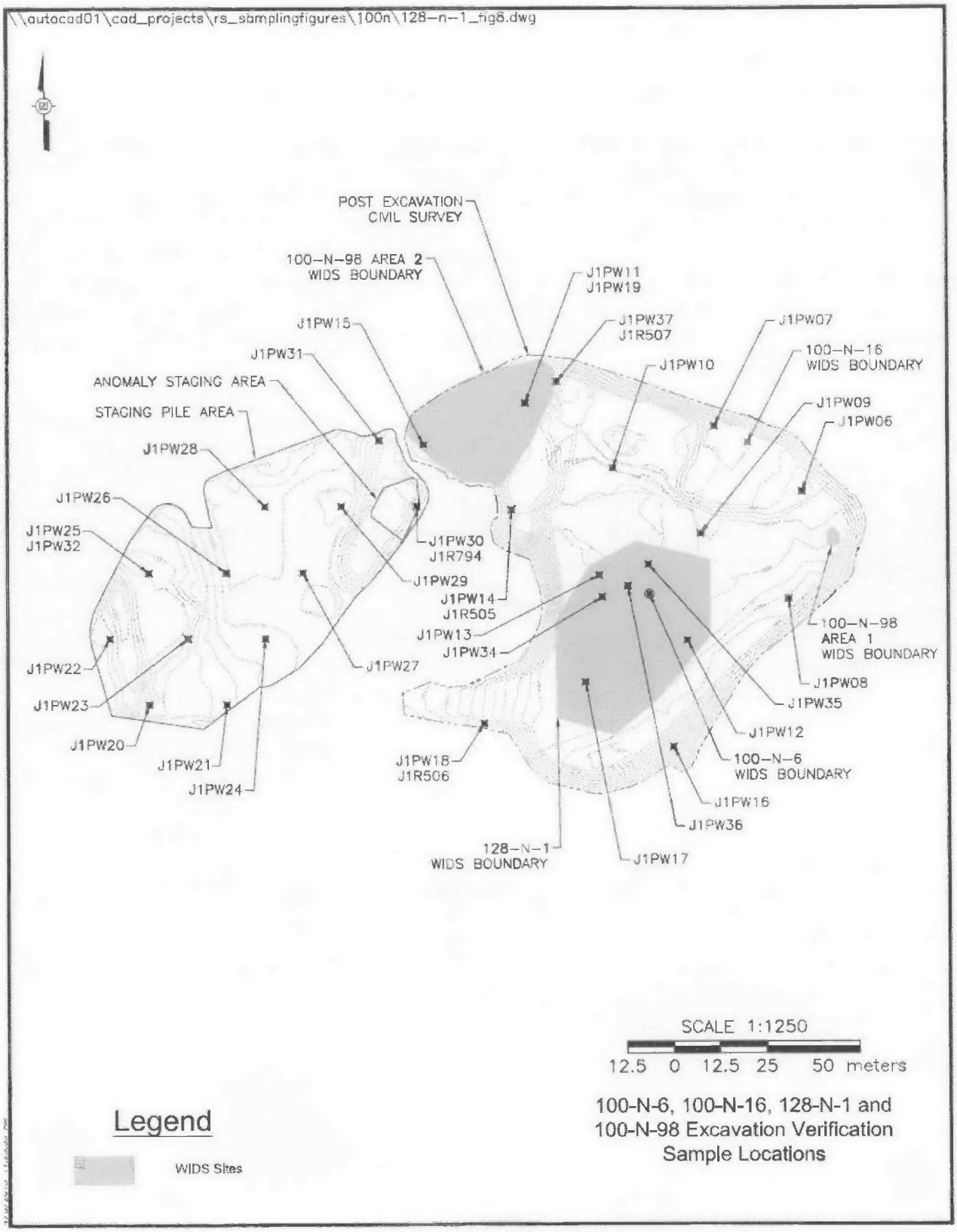


Figure 11. Verification Sample Locations for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 on Post-Excavation Civil Survey.



Verification Sample Results

All verification samples were analyzed using analytical methods approved by the EPA (DOE-RL 2006b). Evaluation of the verification data from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites was performed by direct comparison of the statistical or maximum sample results for each COPC against cleanup criteria.

The primary statistical calculation to evaluate compliance with cleanup standards is the 95% upper confidence limit (UCL) on the arithmetic mean of the data. The 95% UCL values for each detected COPC are computed for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 excavation and staging pile area as specified by the RDR/RAWP (DOE-RL 2006b). The calculations are provided in Appendix B. When a nonradionuclide COPC was detected in fewer than 50% of the verification samples collected for a decision unit, the maximum detected value was used for comparison to RAGs. If no detections for a given COPC were reported in the data set, then no statistical calculation or evaluation was performed for that COPC.

Comparisons of the results for each COPC from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 excavation area and staging pile area statistical and focused verification samples against site RAGs are summarized in Tables 4 through 6. Contaminants that were not detected by laboratory analysis are excluded from this table. Calculated cleanup levels for calcium, magnesium, potassium, silicon, and sodium are not presented in the 100-N Area RDR/RAWP (DOE-RL 2006b). Parameters to calculate cleanup levels for these constituents are not presented in the Cleanup Levels and Risk Calculations (CLARC) Database (Ecology 2011) under WAC 173-340-740(3) or other reference databases. 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 laboratory-reported data results for all constituents are stored in the Environmental Restoration (ENRE) project-specific database prior to provision to the Hanford Environmental Information System (HEIS) and are presented as an attachment to the 95% UCL calculation in Appendix D.

Table 4. Comparison of Statistical Samples Contaminant Concentrations to Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Excavation Sampling Data. (2 Pages)

COPC	Statistical or Maximum Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	3.9 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	86.9 (<BG)	16,000 [d]	200	400	No	--
Beryllium	0.49 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Boron [f]	1.7	16,000 [d]	320	NA	No	--
Cadmium [g]	0.14 (<BG)	13.9 [e]	0.81 [c]	0.81 [c]	No	--
Chromium (total)	13.0 (<BG)	120,000 [d]	18.5 [c]	18.5 [c]	No	--
Cobalt	8.9 (<BG)	24 [d]	15.7 [c]	NA	No	--
Copper	65.2	2,960 [d]	59.2	22.0 [c]	Yes	Yes [h]
Lead	43.8	353	10.2 [c]	10.2 [c]	Yes	Yes [h]
Manganese	311 (<BG)	3,760 [d]	512 [c]	NA	No	--
Mercury	0.0076 (<BG)	24 [d]	0.33 [c]	0.33 [c]	No	--
Molybdenum [f]	0.44	400 [d]	8	NA	No	--
Nickel	15.5 (<BG)	1,600 [d]	19.1 [c]	27.4	No	--
Silver	0.24 (<BG)	400 [d]	8	0.73 [c]	No	--
Vanadium	56.5 (<BG)	560 [d]	85.1 [c]	NA	No	--
Zinc	49.1 (<BG)	24,000 [d]	480	67.8 [c]	No	--
2-methylnaphthalene	0.031	320 [d]	3.2	NA	No	--
Acetone	0.0086	72,000 [d]	720	NA	No	--
Anthracene	0.015	24,000 [d]	240	1,920	No	--
Aroclor-1254	0.016	0.5	0.017 [i]	0.017 [i]	No	--
Aroclor-1260	0.052	0.5	0.017 [i]	0.017 [i]	Yes	Yes [h]
Total PCBs	0.068	0.5	0.017 [i]	0.017 [i]	Yes	Yes [h]
Benzo(a)anthracene	0.054	1.37	0.015 [i]	0.015 [i]	Yes	Yes [h]
Benzo(a)pyrene	0.093	0.137	0.015 [i]	0.015 [i]	Yes	Yes [h]
Benzo(b)fluoranthene	0.094	1.37	0.015 [i]	0.015 [i]	Yes	Yes [h]
Benzo(ghi)perylene [j]	0.075	2,400 [d]	48	192	No	--
Benzo(k)fluoranthene	0.039	13.7	0.12 [i]	0.015 [i]	Yes	Yes [h]
Carbazole	0.21	50	0.437	NA	No	--
Chrysene	0.084	137	1.2	0.1 [i]	No	--
Di-n-octylphthalate	0.076	1,600 [d]	32	NA	No	--
Dibenz(a,h)anthracene	0.019	0.137	0.03 [i]	0.03 [i]	No	--
Dibenzofuran	0.075	160 [d]	3.20	NA	No	--
Fluoranthene	0.11	3,200 [d]	64	18.0	No	--
Fluorene	0.0094	3,200 [d]	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.070	1.37	0.015 [i]	0.015 [i]	Yes	Yes [h]
Methylene chloride	0.011	133	0.5	0.94	No	--
Phenanthrene [j]	0.046	24,000 [d]	240	1,920	No	--

Table 4. Comparison of Statistical Samples Contaminant Concentrations to Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Excavation Sampling Data. (2 Pages)

COPC	Statistical or Maximum Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Pyrene	0.14	2,400 [d]	48	192	No	--
Styrene	0.0012	33.3	0.146	NA	No	--
TPH-diesel range	20	200	200	200	No	--
TPH-diesel range EXT	27	200	200	200	No	--

[a] RAGs obtained from the 100-N Area RDR/RAWP (DOE-RL 2006b) or the 100 Area RDR/RAWP (DOE-RL 2009).
[b] Maximum or 95% UCL, depending on data censorship, as described in Appendix D.
[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d) (Ecology 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 100-N Area RDR/RAWP (DOE-RL 2006b).
[d] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), Method B (Ecology 1996).
[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 available.
[g] Hanford Site-specific background value is not available; it was not evaluated during background study. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[h] Based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2006b), the residual concentrations of copper, lead, aroclor-1260, total PCBs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene are not expected to migrate more than 3.0 m (9.8 ft) vertically in 1,000 years (based on the contaminant with the lowest K_d value, copper with a K_d value of 22 mL/g). The vadose zone underlying the excavation is approximately 18 m (59 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.
[i] 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.
[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
benzo(ghi)perylene; surrogate: pyrene
phenanthrene; surrogate: anthracene.

-- = not applicable
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*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

Table 5. Comparison of Focused Samples Contaminant Concentrations to Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Sampling Data. (2 Pages)

COPC	Maximum Result (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	4.1 (<BG)	20 [b]	20 [b]	20 [b]	No	--
Barium	49.4 (<BG)	16,000 [c]	200	400	No	--
Beryllium	0.55 (<BG)	10.4 [d]	1.51 [b]	1.51 [b]	No	--
Boron [e]	1.5	16,000 [c]	320	NA	No	--
Cadmium [f]	0.17 (<BG)	13.9 [d]	0.81 [b]	0.81 [b]	No	--
Chromium (total)	11.4 (<BG)	120,000 [c]	18.5 [b]	18.5 [b]	No	--
Cobalt	9.3 (<BG)	24 [c]	15.7 [b]	NA	No	--
Copper	21.8 (<BG)	2,960 [c]	59.2	22.0 [b]	No	--
Lead	8.0 (<BG)	353	10.2 [b]	10.2 [b]	No	--
Manganese	298 (<BG)	3,760 [c]	512 [b]	NA	No	--
Mercury	0.021 (<BG)	24 [c]	0.33 [b]	0.33 [b]	No	--
Nickel	11.7 (<BG)	1,600 [c]	19.1 [b]	27.4	No	--
Silver	0.60 (<BG)	400 [c]	8	0.73 [b]	No	--
Vanadium	59.0 (<BG)	560 [c]	85.1 [b]	NA	No	--
Zinc	60.5 (<BG)	24,000 [c]	480	67.8 [b]	No	--
1,1-Dichloroethene	0.00075	1.67	0.010 [g]	0.386	No	--
Acetone	0.0073	72,000 [c]	720	NA	No	--
Aroclor-1254	0.0077	0.5	0.017 [g]	0.017 [g]	No	--
Aroclor-1260	0.044	0.5	0.017 [g]	0.017 [g]	Yes	Yes [h]
PCB total	0.0517	0.5	0.017 [g]	0.017 [g]	Yes	Yes [h]
Benzo(a)pyrene	0.011	0.137	0.015 [g]	0.015 [g]	No	--
Benzo(b)fluoranthene	0.0096	1.37	0.015 [g]	0.015 [g]	No	--
Bis(2-ethylhexyl)phthalate	0.087	71.4	0.6	0.36	No	--
Carbazole	0.039	50	0.437	NA	No	--
Chrysene	0.0083	137	1.2	0.10 [g]	No	--
Fluoranthene	0.013	3,200 [c]	64	18.0	No	--
Methylene chloride	0.018	133	0.5	0.94	No	--
Pyrene	0.015	2,400 [c]	48	192	No	--
Styrene	0.0012	33.3	0.146	NA	No	--
TPH-diesel range	28.0	200	200	200	No	--

Table 5. Comparison of Focused Samples Contaminant Concentrations to Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Sampling Data. (2 Pages)

COPC	Maximum Result (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
TPH-diesel range EXT	43.0	200	200	200	No	--

[a] RAGs obtained from the 100-N Area RDR/RAWP (DOE-RL 2006b) or the 100 Area RDR/RAWP (DOE-RL 2009).
[b] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d) (Ecology 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 100-N Area RDR/RAWP (DOE-RL 2006b).
[c] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), Method B (Ecology 1996).
[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 available.
[f] Hanford Site-specific background value is not available; it was not evaluated during background study. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[g] 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.
[h] Based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2006b), the residual concentrations of aroclor-1260 and total PCBs are not expected to migrate vertically in 1,000 years (based on the aroclor-1260 K_d value of 822 mL/g). When contaminant K_d values are greater than 80 mL/g, RESRAD modeling predicts that the contaminants will show no migration within the 100 Area vadose zone and no impact on groundwater or the Columbia River. Therefore, residual concentrations of aroclor-1260 and total PCBs are predicted to be protective of groundwater and the Columbia River.

-- = not applicable
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*
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

Table 6. Comparison of Statistical Samples Contaminant Concentrations to Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Staging Pile Area Sampling Data. (2 Pages)

COPC	Statistical or Maximum Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	3.07 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	69.6 (<BG)	16,000 [d]	200	400	No	--
Beryllium	0.289 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Boron [f]	3.18	16,000 [d]	320	NA	No	--
Cadmium [g]	0.176 (<BG)	13.9 [c]	0.81 [c]	0.81 [c]	No	--
Chromium (total)	22.1	120,000 [d]	18.5 [c]	18.5 [c]	Yes	Yes [h]
Cobalt	8.73 (<BG)	24 [d]	15.7 [c]	NA	No	--
Copper	22.0	2,960 [d]	59.2	22.0 [c]	Yes	Yes [h]
Lead	7.83 (<BG)	353	10.2 [c]	10.2 [c]	No	--
Manganese	332 (<BG)	3,760 [d]	512 [c]	NA	No	--
Molybdenum [f]	0.736	400 [d]	8	NA	No	--
Nickel	20.7	1,600 [d]	19.1 [c]	27.4	Yes	Yes [h]
Selenium	0.799	400 [d]	5	1	No	--
Vanadium	62.1 (<BG)	560 [d]	85.1 [c]	NA	No	--
Zinc	51.1 (<BG)	24,000 [d]	480	67.8 [c]	No	--
Acenaphthene	0.127	4,800 [d]	96	129	No	--
Acenaphthylene [j]	0.00643	4,800 [d]	96	129	No	--
Acetone	0.00456	72,000 [d]	720	NA	No	--
Anthracene	0.00321	24,000 [d]	240	1,920	No	--
Aroclor-1254	0.0341	0.5	0.017 [i]	0.017 [i]	Yes	Yes [h]
Aroclor-1260	0.0726	0.5	0.017 [i]	0.017 [i]	Yes	Yes [h]
PCBs total	0.107	0.5	0.017 [i]	0.017 [i]	Yes	Yes [h]
Benzo(a)anthracene	0.0111	1.37	0.015 [i]	0.015 [i]	No	--
Benzo(a)pyrene	0.0109	0.137	0.015 [i]	0.015 [i]	No	--
Benzo(b)fluoranthene	0.00796	1.37	0.015 [i]	0.015 [i]	No	--
Benzo(ghi)perylene [j]	0.0119	2,400 [d]	48	192	No	--
Benzo(k)fluoranthene	0.00932	13.7	0.12 [i]	0.015 [i]	No	--
Bis(2-ethylhexyl) phthalate	0.132	71.4	0.6	0.36	No	--
Chrysene	0.0288	137	1.2	0.10 [i]	No	--
Dibenz(a,h)anthracene	0.00255	0.137	0.03 [i]	0.03 [i]	No	--
Fluoranthene	0.0189	3,200 [d]	64	18.0	No	--
Fluorene	0.00740	3,200 [d]	64	260	No	--
Indeno(1,2,3-cd)pyrene	0.0121	1.37	0.015 [i]	0.015 [i]	No	--
Methylene chloride	0.00334	133	0.5	0.94	No	--
Naphthalene	0.0296	1,600	16.0	988	No	--
Phenanthrene [j]	0.0111	24,000	240	1,920	No	--

Table 6. Comparison of Statistical Samples Contaminant Concentrations to Remedial Action Goals for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Staging Pile Area Sampling Data. (2 Pages)

COPC	Statistical or Maximum Result [b] (mg/kg)	Remedial Action Goals [a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Do the Results Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Pyrene	0.0164	2,400 [d]	48	192	No	--
TPH-motor oil	25	200	200	200	No	--

[a] RAGs obtained from the 100-N Area RDR/RAWP (DOE-RL 2006b) or the 100 Area RDR/RAWP (DOE-RL 2009).
[b] Maximum or 95% UCL, depending on data censorship, as described in Appendix D.
[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d) (Ecology 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 100-N Area RDR/RAWP (DOE-RL 2006b).
[d] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), Method B (Ecology 1996).
[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 available.
[g] Hanford Site-specific background value is not available; it was not evaluated during background study. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[h] Based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2006b), the residual concentrations of chromium (total), copper, nickel, aroclor-1254, aroclor-1260, and total PCBs are not expected to migrate more than 3.0 m (9.8 ft) vertically in 1,000 years (based on the contaminant with the lowest K_d value, copper with a K_d value of 22 mL/g). The vadose zone underlying the excavation is approximately 18 m (59 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.
[i] 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.
[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
acenaphthylene; surrogate: acenaphthene
benzo(ghi)perylene; surrogate: pyrene
phenanthrene; surrogate: anthracene

-- = not applicable
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
UCL = upper confidence limit
WAC = *Washington Administrative Code*

CLEANUP VERIFICATION DATA EVALUATION

This section demonstrates that remedial action at the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites has achieved the applicable RAGs developed to support unrestricted land use at the 100-N Area as documented in the 100-N Area RDR/RAWP (DOE-RL 2006b).

Direct Comparison to RAGs

Evaluation of the verification sampling results in Tables 4 through 6 shows that all direct exposure RAGs are met for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites. Groundwater protection and/or Columbia River protection cleanup levels were exceeded for total chromium, copper, lead, nickel, aroclor-1254, aroclor-1260, total PCBs, benzo(a)anthracene,

benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene. However, RESidual RADioactivity (RESRAD) modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2006b) indicates that residual concentrations of contaminants are not predicted to migrate more than 3.0 m (9.8 ft) vertically within 1,000 years (based on the lowest distribution coefficient of the contaminants exceeding RAGs, copper, with a distribution coefficient value of 22 mL/g). The vadose zone underlying the excavation is approximately 18 m (59 ft) thick. Therefore, residual concentrations of total chromium, copper, lead, nickel, aroclor-1254, aroclor-1260, total PCBs, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene are not predicted to migrate through the soil column to groundwater (and thus the Columbia River) within 1,000 years.

Three-Part Test for Nonradionuclides

When using a statistical sampling approach, 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 remediation footprint and the staging pile area is included in the statistical calculations (Appendix D). The results of this evaluation indicate that copper and lead data sets have sample results that exceeded the cleanup limit by greater than two times in comparison against the soil RAGs for groundwater and river protection in the excavation decision unit. In addition, chromium and nickel data sets have sample results that exceeded the cleanup limit by greater than two times in comparison against soil RAGs for groundwater and river protection in the staging pile area decision unit. Greater than 10% of the sample results for copper and lead in the excavation decision unit exceed the cleanup levels. Also, greater than 10% of the sample results for copper, lead, benzo(a)anthracene, and benzo(a)pyrene in the staging pile area exceed the cleanup levels. However, based on the RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2006b), the residual concentration of copper, chromium, lead, nickel, benzo(a)anthracene, and benzo(a)pyrene are not expected to migrate vertically in 1,000 years (based on the lowest distribution coefficient of the contaminants exceeding RAGs, copper, with K_d of 22 mL/g). Therefore, the residual concentrations of these 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, with a few exceptions. The maximum analytical results for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene and aroclor-1260 in the excavation decision unit exceeded the groundwater and/or river protection RAGs, and the maximum results for aroclor-1254 and aroclor-1260 in the staging pile area decision unit exceeded the soil RAGs for groundwater and river protection. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene in the excavation decision unit also failed

because greater than 10% of the results were above the soil RAGs for river protection. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene and aroclor-1260 in the excavation decision unit and aroclor-1254 and aroclor-1260 in the staging pile area contained values that exceeded the cleanup limit by greater than two times in comparison against the soil RAGs for groundwater and river protection. However, as previously discussed, residual concentrations of these constituents are not predicted to migrate to groundwater within 1,000 years and are, therefore, protective of groundwater and the Columbia River.

Direct Contact Noncarcinogenic Hazard Quotient Remedial Action Goal

Assessment of the risk requirements for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites was determined by calculation of the hazard quotient and excess carcinogenic risk. The 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 excess carcinogenic risk of less than 1×10^{-5}. Hazard quotient and excess carcinogenic risk calculations for direct contact were conservatively performed for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites in Appendix D using the highest of the focused and statistical values from all decision units. Risk values were not calculated for constituents that were not detected or were detected at concentrations below Hanford Site or Washington State background values. All individual hazard quotients are below 1.0, and all individual excess carcinogenic risk values are below 1×10^{-6}. The direct contact cumulative hazard quotient for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites is 6.1×10^{-2}, and the cumulative excess carcinogenic risk value is 1.2×10^{-6}, satisfying the criteria to be less than 1.0 and less than 1×10^{-5}, respectively. Therefore, the nonradionuclide risk requirements are met.

Hazard Quotient and Carcinogenic Risk Calculation for Groundwater

Assessment of the risk requirements for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites 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 1×10^{-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 100-N Area RDR/RAWP (DOE-RL 2006b). The cumulative hazard quotient is 9.7×10^{-2}, which is less than 1.0. The cumulative excess carcinogenic risk value is 1.4×10^{-7}. Nonradionuclide risk requirements related to groundwater are met.

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the verification sampling approach (WCH 2012a), the field logbooks (WCH 2012b, WCH 2012c, WCH 2012d), and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications. The DQA for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste site established that the data are of the right type, quality, and quantity to support site verification decisions within specified error tolerances. All analytical data were found to be acceptable for decision-making purposes. The cleanup verification sample analytical data are stored in the ENRE project-specific database for data evaluation prior to their archival in HEIS and are summarized in Appendix D. The detailed DQA is presented in Appendix E.

SUMMARY FOR INTERIM CLOSURE

The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites have been evaluated in accordance with the 100-N Area ROD (EPA 1999) and the 100-N Area RDR/RAWP (DOE-RL 2006b). Remedial action was performed between August 2010 and December 2012, removing contaminated soil and debris from the site. Verification sampling was performed between July 25 and December 13, 2012, and the analytical results indicate that the residual concentrations of COPCs meet the RAGs and associated remedial action objectives for direct exposure, groundwater protection, and river protection. In accordance with this evaluation, the verification sampling and modeling results support a reclassification of the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites to Interim Closed Out. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

REFERENCES

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, as amended.

BHI, 2001, Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater, 0100X-CA-V0038, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, as amended, U.S. Department of Energy, Washington, D.C.

DOE-RL, 2006a, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites,* DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2006b, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area,* DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2009, *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.

DOE-RL, 2011, *Tri-Party Agreement Handbook Management Procedures,* RL-TPA-90-0001, Rev. 2, Guideline Number TPA-MP-14, "Maintenance of the Waste Information Data System (WIDS)," U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2012, "128-N-1 Staging Pile Area Plume Chase Request" CCN 169057, E-Mail Message to W. Elliot, J. E. Jakubek, Washington Closure Hanford, from J. C. Chance, U.S. Department of Energy, Richland Operations Office, Richland, Washington, December 17.

Ecology, 1994, *Natural Background Soil Metals Concentrations in Washington State,* Publication No. 94-115, Washington State Department of Ecology, Olympia, Washington.

Ecology, 1996, "Model Toxics Control Act – Cleanup," *Washington Administrative Code* (WAC) 173-340, Washington State Department of Ecology, Olympia, Washington.

Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.

Ecology, 2012, "128-N-1 Additional Remediation Proposal" CCN 168091, E-Mail Message to J. E. Jakubek, Washington Closure Hanford, from W. Elliott, Washington State Department of Ecology, Richland, Washington, October 11.

ENV-1, *Environmental Monitoring & Management*, Washington Closure Hanford, Richland, Washington.

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.

EPA, 1999, *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington,* U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

EPA, 2011, *Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision*, Hanford Site, Benton County, Washington, AR/PIR/0093940, March 2011, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

WAC 173-340, 2007, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, as amended.

WCH, 2012a, *Work Instruction for Verification Sampling of the 100-N-6, 128-N-1; 128N-F8-3, 100-N-16, 128M-FS-2, Burn Pit 1, 100-N-98, 100-N Stain Area #3, 128-N-1, 128-N-1 Burning Pit, 100-N Burning Pit Waste Sites*, Work Instruction No. 0100N-WI-G0049, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2012b, *100N Field Remediation Sampling*, Logbook EL-1652-06, pp. 70-73, Washington Closure Hanford, Richland, Washington.

WCH, 2012c, *100N Field Remediation Sampling*, Logbook EL-1652-07, pp. 60-62 and 71-75, Washington Closure Hanford, Richland, Washington.

WCH, 2012d, *100N Field Remediation Sampling*, Logbook EL-1652-08, pp. 6-7, Washington Closure Hanford, Richland, Washington.

WDOH, 1997, *Hanford Guidance for Radiological Cleanup*, WDOH/320-015, Rev. 1, Washington State Department of Health, Olympia, Washington.

WHC, 1994, *100-N Area Technical Baseline Report,* WHC-SD-EN-TI-251, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A

EXCEEDANCES OF ECOLOGICAL SCREENING LEVELS FOR THE 100-N-6, 100-N-16, 100-N-98, AND 128-N-1 WASTE SITES

Table A-1. Maximum Contaminant Concentrations that Exceed Ecological Screening Levels for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites [a].

Hazardous Substance		2007 WAC 173-340, Table 749-3			EPA Ecological Soil Screening Levels [b]				Maximum of Focused or Statistical Result
		Plants	Soil Biota	Wildlife	Plants	Soil Biota	Avian [c]	Mammalian [c]	
	Background	Metals (mg/kg)							
Boron	--	0.5	--	--	--	--	--	--	3.18
Copper	22	100	50	217	70	80	28	49	65.2
Lead	10.2	50	500	118	120	1,700	11	56	43.8
Manganese	512	1,100 [d]	--	1,500	220	450	4,300	4,000	332 (<BG)
Selenium	0.78	1	70	0.3	0.52	4.1	1.2	0.63	0.799
Vanadium	85.1	2	--	--	--	--	7.8	280	62.1 (<BG)
Zinc	67.8	86 [d]	200	360	160	120	46	79	60.5 (<BG)

NOTE: Shaded cells are exceeded by the maximum of the focused or 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] Benchmark replaced by Washington State natural background concentration from Ecology, 1994, *Natural Background Soil Metals Concentrations in Washington State*, Publication 94-115, Washington State Department of Ecology, Olympia, Washington.

-- = values not available
BG = Hanford Site background
EPA = U.S. Environmental Protection Agency
WAC = *Washington Administrative Code*

APPENDIX B

IN-PROCESS SAMPLE RESULTS

Table B-1: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Radionuclides (Page 1of 2)

LOCATION	HEIS Number	Sample Date	Americium-241			Cesium-137			Cobalt-60			Europium-152		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile A-1	J1BYV7	8/5/10	0.338	U	0.338	0.096	U	0.096	0.094	U	0.094	0.210	U	0.210
Stockpile A-2	J1BYV8	8/5/10	0.089	U	0.089	0.071	U	0.071	0.076	U	0.076	0.182	U	0.182
Stockpile A-3	J1BYV9	8/5/10	0.130	U	0.130	0.129	U	0.129	0.129	U	0.129	0.299	U	0.299
Stockpile A-4	J1BYW0	8/5/10	0.104	U	0.104	0.093	U	0.093	0.098	U	0.098	0.237	U	0.237
Stockpile A-5	J1CCW6	10/6/10	0.181	U	0.181	0.071	U	0.071	0.069	U	0.069	0.195	U	0.195
Stockpile A-6	J1CCW7	10/6/10	0.435	U	0.435	0.085	U	0.085	0.126	U	0.126	0.267	U	0.267
EX-A1	J1H221	4/12/11	-0.0086	U	0.110	0.0218	U	0.107	-0.00772	U	0.112	-0.0121	U	0.254
EX-A2	J1H222	4/12/11	0.000241	U	0.146	-0.0489	U	0.127	-0.0173	U	0.154	-0.0873	U	0.300
EX-A3	J1H223	4/12/11	0.00814	U	0.202	-0.0196	U	0.0809	-0.0136	U	0.0884	0.0764	U	0.230
EX-A4	J1H224	4/12/11	-0.0624	U	0.301	0.0330	U	0.0685	-0.00175	U	0.0732	-0.0110	U	0.135
EX-A5	J1H225	4/12/11	-0.0600	U	0.115	0.000422	U	0.104	-0.00328	U	0.110	0.00738	U	0.258
1 Soil with diesel oil	J1LJF0	11/28/11	0.00497	U	0.234	-0.00985	U	0.0229	-0.00604	U	0.0267	-0.00500	U	0.0653

LOCATION	HEIS Number	Sample Date	Europium-154			Europium-155			Potassium-40			Radium-226		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile A-1	J1BYV7	8/5/10	0.334	U	0.334	0.206	U	0.206	12.7		1.01	0.503		0.190
Stockpile A-2	J1BYV8	8/5/10	0.237	U	0.237	0.172	U	0.172	13.3		0.844	0.522		0.106
Stockpile A-3	J1BYV9	8/5/10	0.398	U	0.398	0.269	U	0.269	14.6		1.29	0.622		0.216
Stockpile A-4	J1BYW0	8/5/10	0.256	U	0.256	0.195	U	0.195	12.9		0.934	0.448		0.163
Stockpile A-5	J1CCW6	10/6/10	0.187	U	0.187	0.208	U	0.208	11.6		0.629	0.505		0.128
Stockpile A-6	J1CCW7	10/6/10	0.401	U	0.401	0.229	U	0.229	12.1		0.976	0.596		0.175
EX-A1	J1H221	4/12/11	0.00246	U	0.312	0.00931	U	0.180				0.384	U	0.314
EX-A2	J1H222	4/12/11	0.0715	U	0.416	-0.0336	U	0.221				1.05		0.221
EX-A3	J1H223	4/12/11	0.0361	U	0.309	0.0757	U	0.186				0.484	U	0.286
EX-A4	J1H224	4/12/11	0.0328	U	0.229	-0.00889	U	0.130				0.463	U	0.232
EX-A5	J1H225	4/12/11	0.0688	U	0.318	-0.0444	U	0.178				0.524	U	0.311
1 Soil with diesel oil	J1LJF0	11/28/11	0.00679	U	0.0807	0.0130	U	0.0778				0.377		0.0445

Table B-1: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Radionuclides (Page 2 of 2).

LOCATION	HEIS Number	Sample Date	Radium-228			Thorium-228			Thorium-232			Uranium-235		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile A-1	J1BYV7	8/5/10	0.794		0.421	0.672		0.150	0.794		0.421	0.393	U	0.393
Stockpile A-2	J1BYV8	8/5/10	0.656		0.318	0.612		0.088	0.656		0.318	0.371	U	0.371
Stockpile A-3	J1BYV9	8/5/10	0.839	U	0.839	0.817		0.220	0.839	U	0.839	0.689	U	0.689
Stockpile A-4	J1BYW0	8/5/10	1.05		0.396	0.698		0.104	1.05		0.396	0.450	U	0.450
Stockpile A-5	J1CCW6	10/6/10	0.574		0.313	0.572		0.086	0.574		0.313	0.498	U	0.498
Stockpile A-6	J1CCW7	10/6/10	0.848		0.392	0.784		0.126	0.848		0.392	0.509	U	0.509
EX-A1	J1H221	4/12/11												
EX-A2	J1H222	4/12/11												
EX-A3	J1H223	4/12/11												
EX-A4	J1H224	4/12/11												
EX-A5	J1H225	4/12/11												
1 Soil with diesel oil	J1LJF0	11/28/11												

LOCATION	HEIS Number	Sample Date	Uranium-238		
			pCi/g	Q	MDA
Stockpile A-1	J1BYV7	8/5/10	11.2	U	11.2
Stockpile A-2	J1BYV8	8/5/10	8.21	U	8.21
Stockpile A-3	J1BYV9	8/5/10	13.8	U	13.8
Stockpile A-4	J1BYW0	8/5/10	11.3	U	11.3
Stockpile A-5	J1CCW6	10/6/10	7.77	U	7.77
Stockpile A-6	J1CCW7	10/6/10	11.9	U	11.9
EX-A1	J1H221	4/12/11			
EX-A2	J1H222	4/12/11			
EX-A3	J1H223	4/12/11			
EX-A4	J1H224	4/12/11			
EX-A5	J1H225	4/12/11			
1 Soil with diesel oil	J1LJF0	11/28/11			

Table B-2: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Metals (Page 1 of 5).

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
Stockpile A-1	J1BYV7	8/5/10	8070		4.44	1.66		0.533	3.01		0.889	98.8		0.444	0.217		0.178
Stockpile A-2	J1BYV8	8/5/10	7880		4.73	1.17		0.568	2.79		0.946	83.4		0.473	0.218		0.189
Stockpile A-3	J1BYV9	8/5/10	7780		3.66	7.67		0.439	5.12		0.731	264		0.366	0.190		0.146
Stockpile A-4	J1BYW0	8/5/10	9400		4.06	3.48		0.488	4.12		0.813	173		0.406	0.194		0.163
Stockpile A-5	J1CCW6	10/6/10	7900		3.97	0.476	U	0.48	2.77		0.793	63.7		0.397	0.279		0.159
Stockpile A-6	J1CCW7	10/6/10	7820		3.54	0.424	U	0.424	3.04		0.707	67.0		0.354	0.252		0.141
1 Black substance	J1CP25	12/9/10	1790		1.9	2.3		0.45	1.5		0.79	44.3		0.091	0.080	B	0.039
5 Soil under 55-gl drum	J1CXN7	12/9/10	7470		1.5	1.1		0.37	4.9		0.65	170	X	0.075	0.19	B	0.033
2 Black substance	J1CXP9	12/9/10	7750		2.9	0.71	U	0.71	5.4		1.2	240		0.14	0.43	N	0.061
7 Soil with bunker oil	J1CXX6	12/9/10	5770		1.6	0.53	B	0.39	2.9	MN	0.67	56.7		0.077	0.13	BN	0.034
3 Soil	J1CXX9	12/9/10	13600		1.7	3.8		0.42	4.8		0.73	193		0.084	1.6		0.036
3 Beads	J1CXY0	12/9/10	19000		1.7	3.0		0.42	3.9	N	0.72	135		0.083	0.47	M	0.036
6 Soil with amber oil	J1CY07	12/9/10	5940		1.6	0.39	U	0.39	3.1	M	0.68	56.5		0.078	0.13	B	0.034
4 Tar substance	J1CY08	12/9/10	2220	M	2.1	6.7	M	0.51	9.0	M	0.89	115	M	0.10	0.081	B	0.045
EX-A1	J1H221	4/12/11	5800		1.5	0.37	U	0.37	2.6		0.64	46.0		0.073	0.032	U	0.032
EX-A2	J1H222	4/12/11	7870		1.3	0.32	U	0.32	2.5		0.56	73.0		0.065	0.12	B	0.028
EX-A3	J1H223	4/12/11	6510		1.5	0.38	U	0.38	3.1		0.66	46.6		0.076	0.065	B	0.033
EX-A4	J1H224	4/12/11	6310		1.4	0.34	U	0.34	2.5		0.59	57.0		0.068	0.10	B	0.030
EX-A5	J1H225	4/12/11	7020		2.9	0.70	U	0.70	2.6		1.2	55.9		0.14	0.061	U	0.061
1 Soil near B-25	J1JW43	6/27/11	9010		1.4	0.33	U	0.33	3.0		0.58	74.2		0.067	0.25		0.029
2 Soil with bunker oil	J1JW44	6/27/11	6850		1.5	0.37	U	0.37	2.5		0.65	65.8		0.074	0.17	B	0.032
3 Soil with diesel oil	J1JW45	6/27/11	7820		1.5	2.1		0.37	3.2		0.64	5710		0.74	0.23		0.032
1 Soil with diesel oil	J1LJF0	11/28/11	4900	X	1.5	0.84		0.36	1.7		0.62	56.0	X	0.072	0.36		0.031
Anomaly staging area 1	J1P286	5/14/12	6920		1.4	0.35	U	0.35	3.6		0.60	59.1		0.069	0.12	B	0.030
Anomaly staging area 2	J1P287	5/14/12	6360		1.7	0.41	U	0.41	2.8		0.71	44.3		0.082	0.049	B	0.036
SPA-3	J1P288	5/14/12	10300		1.6	0.38	U	0.38	3.9		0.67	87.2		0.077	0.22		0.033
SPA-4	J1P289	5/14/12	8460		1.4	0.34	U	0.34	3.5		0.6	70.4		0.069	0.17	B	0.030
SPA-5	J1P290	5/14/12	7810		1.4	0.34	U	0.34	3.1		0.58	60.9		0.067	0.17	B	0.029

Table B-2: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Metals (Page 2 of 5).

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
Stockpile A-1	J1BYV7	8/5/10	4.49		1.78	0.703		0.178	6520		88.9	20.9		0.18	6.78		1.78
Stockpile A-2	J1BYV8	8/5/10	2.63		1.89	0.283		0.189	4470		94.6	11.3		0.19	6.02		1.89
Stockpile A-3	J1BYV9	8/5/10	13.8		1.46	4.08		0.146	11200		73.1	45.0		0.146	7.62		1.46
Stockpile A-4	J1BYW0	8/5/10	9.45		1.63	1.35		0.163	10100		81.3	29.3		0.163	8.11		1.63
Stockpile A-5	J1CCW6	10/6/10	2.57		1.59	0.263		0.159	5240		79.3	10.8		0.159	6.97		1.59
Stockpile A-6	J1CCW7	10/6/10	1.46		1.41	0.110	B	0.141	7430		70.7	12.2		0.141	5.48		1.41
1 Black substance	J1CP25	12/9/10	11.4		1.2	0.49	M	0.049	3850		16.9	81.1	N	0.069	11.8		0.12
5 Soil under 55-gl drum	J1CXN7	12/9/10	6.4		0.97	1.4		0.040	12100		13.9	19.8	N	0.057	9.5	X	0.099
2 Black substance	J1CXP9	12/9/10	3.2	BN	1.8	0.076	U	0.076	1280		26.2	10.3		0.11	4.5		0.19
7 Soil with bunker oil	J1CXX6	12/9/10	3.3	MN	1.0	0.39	M	0.042	7160		14.3	81.2		0.059	6.0	N	0.10
3 Soil	J1CXX9	12/9/10	7.6	N	1.1	2.8	X	0.046	9860	N	15.7	72.6	N	0.064	18.1	X	0.11
3 Beads	J1CXY0	12/9/10	6.4	N	1.1	2.5		0.045	8710	N	15.4	47.7	X	0.064	11.8	XN	0.11
6 Soil with amber oil	J1CY07	12/9/10	2.7	MN	1.0	0.12	B	0.042	8510		14.5	9.5		0.060	7.1	X	0.10
4 Tar substance	J1CY08	12/9/10	12.4	M	1.3	0.84	M	0.055	5750		19.0	34.8		0.078	17.7		0.13
EX-A1	J1H221	4/12/11	2.4	NM	0.95	0.18		0.038	10800		13.6	10.7	X	0.056	5.9		0.097
EX-A2	J1H222	4/12/11	1.4	B	0.83	0.098	B	0.037	5510		12.0	12.5	X	0.049	6.0		0.085
EX-A3	J1H223	4/12/11	1.6	B	0.98	0.089	B	0.040	13800		14.0	11.8	X	0.058	6.2		0.10
EX-A4	J1H224	4/12/11	1.3	B	0.88	0.099	B	0.037	7150		12.7	13.1	X	0.052	5.0		0.090
EX-A5	J1H225	4/12/11	1.8	U	1.8	0.19		0.035	8230		26.0	28.6	X	0.11	7.3		0.18
1 Soil near B-25	J1JW43	6/27/11	2.4		0.86	0.11	B	0.036	4810		12.4	13.5		0.051	7.0	X	0.088
2 Soil with bunker oil	J1JW44	6/27/11	0.96	U	0.96	0.040	B	0.040	9520		13.8	10.2		0.057	10.2	X	0.098
3 Soil with diesel oil	J1JW45	6/27/11	4.7		0.95	0.13	B	0.040	4620		13.7	16.5		0.056	7.1	X	0.097
1 Soil with diesel oil	J1LJF0	11/28/11	0.92	U	0.92	0.039	U	0.039	5850	X	13.3	4.4	X	0.055	9.4	X	0.094
Anomaly staging area 1	J1P286	5/14/12	2.1		0.89	0.11	BM	0.037	18000	X	12.8	10.6	X	0.053	8.1	X	0.091
Anomaly staging area 2	J1P287	5/14/12	1.1	U	1.1	0.052	B	0.044	7120	X	15.2	9.8	X	0.063	8.5	X	0.11
SPA-3	J1P288	5/14/12	2.6		0.99	0.21		0.041	8190	X	14.2	15.9	X	0.059	7.6	X	0.10
SPA-4	J1P289	5/14/12	2.1		0.89	0.36		0.037	8450	X	12.8	14.2	X	0.053	7.1	X	0.091
SPA-5	J1P290	5/14/12	1.7	B	0.87	0.10	B	0.036	7170	X	12.5	10.8	X	0.051	7.3	X	0.088

Table B-2: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Metals (Page 3 of 5).

LOCATION	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
Stockpile A-1	J1BYV7	8/5/10	58.8		0.889	18300		17.8	61.1		0.444	4720		66.6	287		4.44
Stockpile A-2	J1BYV8	8/5/10	24.7		0.945	16400		18.9	18.2		0.473	3640		71.0	271		4.73
Stockpile A-3	J1BYV9	8/5/10	274		0.731	26900		14.6	220		0.366	5570		54.8	372		3.66
Stockpile A-4	J1BYW0	8/5/10	296		0.813	21300		16.3	108		0.406	4840		60.9	378		4.06
Stockpile A-5	J1CCW6	10/6/10	21.4		0.793	20800		15.9	12.0		0.40	4130		59.5	314		3.97
Stockpile A-6	J1CCW7	10/6/10	13.1		0.707	17000		14.1	3.49		0.354	4710		53.0	274		3.54
1 Black substance	J1CP25	12/9/10	12.1		0.26	13400	M	4.5	14.1		0.32	38400		4.4	185	M	0.12
5 Soil under 55-gl drum	J1CXN7	12/9/10	187	M	0.21	22700		3.7	162	XN	0.27	4570	X	3.6	337	X	0.099
2 Black substance	J1CXP9	12/9/10	36.0		0.40	22900		7.1	5.5		0.50	302		6.9	88.1		0.19
7 Soil with bunker oil	J1CXX6	12/9/10	36.2		0.22	18300		3.9	52.5	N	0.27	3370		3.8	240		0.10
3 Soil	J1CXX9	12/9/10	399	M	0.24	25800	M	4.2	767	XM	0.30	4880		4.1	539		0.11
3 Beads	J1CXY0	12/9/10	562	M	0.24	21500		4.2	132	N	0.30	4400		4.1	424		0.11
6 Soil with amber oil	J1CY07	12/9/10	24.4	M	0.22	18000		3.9	53.8	MX	0.28	3820	X	3.8	274		0.10
4 Tar substance	J1CY08	12/9/10	107	MN	0.29	79200		5.1	446	M	0.36	1710	M	5.0	525		0.13
EX-A1	J1H221	4/12/11	18.4		0.21	16500		3.7	5.5	M	0.26	4320		3.6	251		0.097
EX-A2	J1H222	4/12/11	15.8		0.18	16500		3.2	4.0		0.23	3910		3.1	270		0.085
EX-A3	J1H223	4/12/11	17.4		0.22	16800		3.8	3.4		0.27	5050		3.7	263		0.10
EX-A4	J1H224	4/12/11	15.4		0.20	13200		3.4	2.6		0.24	4430		3.3	252		0.090
EX-A5	J1H225	4/12/11	32.9		0.40	18800		7.0	20.1		0.50	4900		6.8	300		0.18
1 Soil near B-25	J1JW43	6/27/11	23.8	N	0.19	19600		3.3	9.7		0.24	4020		3.2	308	X	0.088
2 Soil with bunker oil	J1JW44	6/27/11	17.2		0.21	25700		3.7	4.7		0.26	5210		3.6	339	X	0.098
3 Soil with diesel oil	J1JW45	6/27/11	2960		0.21	20000		3.7	5190		0.26	4060		3.6	291	X	0.097
1 Soil with diesel oil	J1LJF0	11/28/11	16.9	X	0.20	25500	X	3.6	1.8		0.25	4540	X	3.5	334	X	0.094
Anomaly staging area 1	J1P286	5/14/12	21.9	X	0.20	21700	X	3.5	5.1		0.25	5490	X	3.4	311	X	0.091
Anomaly staging area 2	J1P287	5/14/12	19.6	X	0.23	24300	X	4.1	3.8		0.29	4530	X	4.0	282	X	0.11
SPA-3	J1P288	5/14/12	30.2	X	0.22	21200	X	3.8	39.1		0.27	5010	X	3.7	336	X	0.10
SPA-4	J1P289	5/14/12	22.4	X	0.20	19400	X	3.4	39.3		0.24	4640	X	3.4	302	X	0.091
SPA-5	J1P290	5/14/12	18.1	X	0.19	20100	X	3.4	6.2		0.24	4290	X	3.3	303	X	0.088

Table B-2: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Metals (Page 4 of 5).

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
Stockpile A-1	J1BYV7	8/5/10	0.0178	B	0.0279	0.793	B	1.78	27.6		3.55	1480		355	0.267	U	0.267
Stockpile A-2	J1BYV8	8/5/10	0.0303	U	0.0300	0.593	B	1.89	22.6		3.79	1430		379	0.284	U	0.280
Stockpile A-3	J1BYV9	8/5/10	0.0606		0.0286	3.43		1.46	54.2		2.92	1370		292	0.219	U	0.219
Stockpile A-4	J1BYW0	8/5/10	0.0656		0.0297	1.81		1.63	55.1		3.25	1530		325	0.244	U	0.244
Stockpile A-5	J1CCW6	10/6/10	0.0522		0.0273	0.512	B	1.59	23.3		3.17	1590		317	0.238	U	0.238
Stockpile A-6	J1CCW7	10/6/10	0.0280	U	0.0280	0.336	B	1.41	11.1		2.83	1350		283	0.249		0.212
1 Black substance	J1CP25	12/9/10	0.53	MN	0.0069	0.75	BM	0.31	229	N	0.15	438		49.1	1.0	U	1.0
5 Soil under 55-gl drum	J1CXN7	12/9/10	0.30		0.0060	1.9	B	0.26	40.7	X	0.12	1340		40.4	0.85	U	0.85
2 Black substance	J1CXP9	12/9/10	0.041	N	0.0099	1.2	BN	0.48	19.5		0.23	126	B	76.1	10.2	N	1.6
7 Soil with bunker oil	J1CXX6	12/9/10	0.072	XN	0.0054	0.82	BMN	0.26	24.8	N	0.13	947		41.7	0.87	UN	0.87
3 Soil	J1CXX9	12/9/10	0.39		0.0057	4.1	M	0.29	340	X	0.14	1480		45.5	0.96	U	0.96
3 Beads	J1CXY0	12/9/10	1.1	MN	0.013	3.1	N	0.28	186	MN	0.13	1110		44.9	0.94	UN	0.94
6 Soil with amber oil	J1CY07	12/9/10	0.021		0.0057	0.31	B	0.27	10.6		0.13	1120		42.2	0.88	U	0.88
4 Tar substance	J1CY08	12/9/10	0.0079	U	0.0079	3.2		0.35	61.5	N	0.17	432	M	55.3	1.2	U	1.2
EX-A1	J1H221	4/12/11	0.0070	B	0.0050	0.49	B	0.25	10.6	X	0.12	986		39.6	0.83	U	0.83
EX-A2	J1H222	4/12/11	0.0053	U	0.0053	0.22	U	0.22	10.8	X	0.10	1360		34.9	0.73	U	0.73
EX-A3	J1H223	4/12/11	0.0056	U	0.0056	0.26	U	0.26	10.9	X	0.12	993		40.8	0.86	U	0.86
EX-A4	J1H224	4/12/11	0.0050	U	0.0050	0.23	U	0.23	11.3	X	0.11	991		36.8	0.77	U	0.77
EX-A5	J1H225	4/12/11	0.014	B	0.0054	0.48	U	0.48	25.3	X	0.23	1070		75.7	1.6	U	1.6
1 Soil near B-25	J1JW43	6/27/11	0.0067	B	0.0050	0.34	B	0.23	13.0	X	0.11	1870		35.9	0.75	U	0.75
2 Soil with bunker oil	J1JW44	6/27/11	0.0054	U	0.0054	0.40	B	0.25	12.3	X	0.12	1030		40.2	0.84	U	0.84
3 Soil with diesel oil	J1JW45	6/27/11	0.0077	B	0.0049	0.71	B	0.25	113	X	0.12	1550		39.9	0.84	U	0.84
1 Soil with diesel oil	J1LJF0	11/28/11	0.0052	U	0.0052	0.32	B	0.25	10.6	X	0.12	720		38.7	0.81	U	0.81
Anomaly staging area 1	J1P286	5/14/12	0.0058	U	0.0058	0.85	B	0.24	12.2	X	0.11	1310		37.4	0.78	U	0.78
Anomaly staging area 2	J1P287	5/14/12	0.0055	U	0.0055	0.29	B	0.28	10.0	X	0.13	957		44.3	0.93	U	0.93
SPA-3	J1P288	5/14/12	0.011	B	0.0062	0.26	U	0.26	15.0	X	0.12	1920		41.4	0.87	U	0.87
SPA-4	J1P289	5/14/12	0.016		0.0053	0.24	U	0.24	13.0	X	0.11	1530		37.2	0.78	U	0.78
SPA-5	J1P290	5/14/12	0.0053	B	0.0052	0.23	U	0.23	10.8	X	0.11	1410		36.3	0.76	U	0.76

Table B-2: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Metals (Page 5 of 5).

LOCATION	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Stockpile A-1	J1BYV7	8/5/10	756		1.78	0.944		0.178	385		44.4	53.5		2.22	195		8.89
Stockpile A-2	J1BYV8	8/5/10	701		1.89	0.189	U	0.189	272		47.3	55.6		2.37	84.5		9.46
Stockpile A-3	J1BYV9	8/5/10	666		1.46	4.73		0.146	878		36.6	58.7		1.83	597		7.31
Stockpile A-4	J1BYW0	8/5/10	852		1.63	2.56		0.163	1150		40.6	92.7		2.03	402		8.13
Stockpile A-5	J1CCW6	10/6/10	480		1.59	0.493		0.159	235		39.7	60.7		1.98	78.9		7.93
Stockpile A-6	J1CCW7	10/6/10	385		1.41	0.141	U	0.141	318		35.4	39.2		1.77	32.9		7.07
1 Black substance	J1CP25	12/9/10	102		2.5	0.28		0.19	127	B	70.6	150	N	0.11	61.4	N	0.48
5 Soil under 55-gl drum	J1CXN7	12/9/10	169		2.1	1.4		0.16	748		58.1	70.8		0.093	343	X	0.39
2 Black substance	J1CXP9	12/9/10	245		3.9	0.30	UN	0.30	313		110	22.2		0.17	7.1		0.74
7 Soil with bunker oil	J1CXX6	12/9/10	190	N	2.1	1.6	MN	0.16	209	MN	60.0	31.5		0.10	349		0.40
3 Soil	J1CXX9	12/9/10	246		2.3	6.1		0.18	789		65.5	329		0.10	668		0.44
3 Beads	J1CXY0	12/9/10	411	X*X	2.3	5.1	MN	0.18	660		64.6	217	M	0.10	544	X	0.44
6 Soil with amber oil	J1CY07	12/9/10	100		2.2	0.21	M	0.16	180		60.7	41.9		0.10	48.1		0.41
4 Tar substance	J1CY08	12/9/10	244		2.8	2.7	MN	0.22	541		79.6	45.5		0.13	328		0.54
EX-A1	J1H221	4/12/11	203		5.5	0.39		0.15	318		57.0	41.5	X	0.091	55.3	X	0.38
EX-A2	J1H222	4/12/11	257		4.8	0.14	U	0.14	256		50.2	38.9	X	0.080	33.3	X	0.34
EX-A3	J1H223	4/12/11	253		5.6	0.16	U	0.16	1310		58.8	42.7	X	0.094	33.8	X	0.40
EX-A4	J1H224	4/12/11	202		5.1	0.14	U	0.14	476		53.0	31.9	X	0.084	28.5	X	0.36
EX-A5	J1H225	4/12/11	257		10.5	0.30	U	0.30	360		109	59.2	X	0.17	64.6	X	0.74
1 Soil near B-25	J1JW43	6/27/11	384	N	5.0	0.14	U	0.14	272		51.7	47.4		0.082	42.8	X	0.35
2 Soil with bunker oil	J1JW44	6/27/11	321		5.5	0.16	U	0.16	419		57.8	67.2		0.092	49.3	X	0.39
3 Soil with diesel oil	J1JW45	6/27/11	690		5.5	0.32		0.16	220		57.4	53.0		0.091	75.3	X	0.39
1 Soil with diesel oil	J1LJF0	11/28/11	159		5.3	0.15	U	0.15	396		55.6	66.8	X	0.089	46.9	X	0.38
Anomaly staging area 1	J1P286	5/14/12	672	N	5.2	0.15	U	0.15	1150		53.8	52.3		0.086	44.5	X	0.36
Anomaly staging area 2	J1P287	5/14/12	432		6.1	0.17	U	0.17	432		63.8	63.3		0.10	44.7	X	0.43
SPA-3	J1P288	5/14/12	651		5.7	0.27		0.16	382		59.6	47.3		0.095	93.9	X	0.40
SPA-4	J1P289	5/14/12	761		5.1	0.28		0.15	335		53.5	45.2		0.085	66.2	X	0.36
SPA-5	J1P290	5/14/12	673		5.0	0.14	U	0.14	413		52.2	46.1		0.083	40.3	X	0.35

Table B-3: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - TPH and Physical (Page 1 of 1).

LOCATION	HEIS Number	Sample Date	Oil and grease			TPHs - diesel range			TPH - motor oil			TPH diesel range EXT			Percent moisture (wet sample)		
			mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	%	Q	PQL
Stockpile A-1	J1BYV7	8/5/10				3590	U	3590	3980	J	10800						
Stockpile A-2	J1BYV8	8/5/10				3430	U	3430	24200		10300						
Stockpile A-3	J1BYV9	8/5/10				3670	U	3670	133000		11000						
Stockpile A-4	J1BYW0	8/5/10				78900		3580	121000		10700						
Stockpile A-5	J1CCW6	10/6/10				14200	U	14200	428000		42500						
Stockpile A-6	J1CCW7	10/6/10				3580	U	3580	10700	U	10700						
1 Black substance	J1CP25	12/9/10				81000000	N	100000				100000000	N	150000	21.2		0
5 Soil under 55-gl drum	J1CXN7	12/9/10				41000000	BD	44000				59000000	BD	65000	8.6		0
2 Black substance	J1CXP9	12/9/10													46.1		0
7 Soil with bunker oil	J1CXX6	12/9/10	154000	X	95.7	67000000	D	110000				84000000	D	170000	11.4		0
3 Soil	J1CXX9	12/9/10													10.9		0
3 Beads	J1CXY0	12/9/10													17.8		0
6 Soil with amber oil	J1CY07	12/9/10	4450		93.3	1700000	N	22000				3100000	N	33000	9.2		0
4 Tar substance	J1CY08	12/9/10				220000000	D	580000				290000000	D	860000	30.1		0
EX-A1	J1H221	4/12/11				2300	J	630				3500	J	920	1.5		0
EX-A2	J1H222	4/12/11				990	J	680				1700	J	1000	1.1		0
EX-A3	J1H223	4/12/11				690	U	690				1000	U	1000	5.3		0
EX-A4	J1H224	4/12/11				690	U	690				1000	U	1000	1.5		0
EX-A5	J1H225	4/12/11				28000		670				39000		990	1.6		0
1 Soil near B-25	J1JW43	6/27/11				65000		690				150000		1000	1.6		0
2 Soil with bunker oil	J1JW44	6/27/11				5700		700				9800		1000	4.6		0
3 Soil with diesel oil	J1JW45	6/27/11				8400000	D	110000				13000000	D	160000	1.1		0
1 Soil with diesel oil	J1LJF0	11/28/11				36000	N	660				58000	N	970	0.87		0
Anomaly staging area 1	J1P286	5/14/12				7500	B	700				11000		1000	4.6		0
Anomaly staging area 2	J1P287	5/14/12				3100	JB	700				5900		1000	7.5		0
SPA-3	J1P288	5/14/12				730000	B	820				1100000		1200	17.5		0
SPA-4	J1P289	5/14/12				69000	B	680				100000		1000	0.63		0
SPA-5	J1P290	5/14/12				59000	B	670				120000		980	0.8		0

Table B-4: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - TCLP Metals (Page 1 of 2).

LOCATION	HEIS Number	Sample Date	Mercury			Arsenic			Barium			Cadmium		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Stockpile A-1	J1BYV7	8/5/2010	0.000200	U	0.000200	0.0900	U	0.0900	0.545		0.00600	0.0157	B	0.0180
Stockpile A-2	J1BYV8	8/5/2010	0.000200	U	0.000200	0.0900	U	0.0900	0.437		0.00600	0.00585	B	0.0180
Stockpile A-3	J1BYV9	8/5/2010	0.000200	U	0.000200	0.0900	U	0.0900	0.526		0.00600	0.0319		0.0180
Stockpile A-4	J1BYW0	8/5/2010	0.000200	U	0.000200	0.0900	U	0.0900	0.505		0.00600	0.0234		0.0180
1 Black substance	J1CP25	12/9/2010	0.000030	U	0.000030	0.022	U	0.022	0.20	BXY	0.0020	0.0022	B	0.0020
5 Soil under 55-gl drum	J1CXN7	12/9/2010	0.000030	U	0.000030	0.022	U	0.022	0.58	BX	0.0020	0.028	B	0.0020
2 Black substance	J1CXP9	12/9/2010	0.000030	U	0.000030	0.022	U	0.022	0.12	BX	0.0020	0.0020	U	0.0020
7 Soil with bunker oil	J1CXX6	12/9/2010	0.000030	U	0.000030	0.022	U	0.022	0.36	BX	0.0020	0.0097	B	0.0020
3 Soil	J1CXX9	12/9/2010	0.000030	U	0.000030	0.036	B	0.022	0.55	B	0.0020	0.021	BM	0.0020
6 Soil with amber oil	J1CY07	12/9/2010	0.000030	U	0.000030	0.022	U	0.022	0.37	BX	0.0020	0.0020	U	0.0020
4 Tar substance	J1CY08	12/9/2010	0.000030	U	0.000030	0.022	U	0.022	0.29	BX	0.0020	0.016	B	0.0020
1 Soil with diesel oil	J1K8D8	7/26/2011	0.000030	U	0.000030	0.022	U	0.022	2.6		0.0020	0.0044	B	0.0020
1 Soil with diesel oil	J1LHM8	10/10/2011	0.000078	BC	0.000030	0.022	U	0.022	0.24	B	0.0020	0.0020	U	0.0020

LOCATION	HEIS Number	Sample Date	Chromium			Lead			Selenium			Silver		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Stockpile A-1	J1BYV7	8/5/2010	0.00989	B	0.0300	0.104		0.0600	0.120	U	0.120	0.0360	U	0.0360
Stockpile A-2	J1BYV8	8/5/2010	0.0300	U	0.0300	0.528		0.0600	0.120	U	0.120	0.0360	U	0.0360
Stockpile A-3	J1BYV9	8/5/2010	0.00824	B	0.0300	0.365		0.0600	0.120	U	0.120	0.0360	U	0.0360
Stockpile A-4	J1BYW0	8/5/2010	0.0100	B	0.0300	0.271		0.0600	0.120	U	0.120	0.0360	U	0.0360
1 Black substance	J1CP25	12/9/2010	0.0030	U	0.0030	0.48	B	0.013	0.024	U	0.024	0.0053	BCMX	0.0040
5 Soil under 55-gl drum	J1CXN7	12/9/2010	0.0030	U	0.0030	1.7		0.013	0.024	U	0.024	0.0062	BCX	0.0040
2 Black substance	J1CXP9	12/9/2010	0.0030	U	0.0030	0.013	U	0.013	0.024	U	0.024	0.0066	BCX	0.0040
7 Soil with bunker oil	J1CXX6	12/9/2010	0.026	B	0.0030	0.098	B	0.013	0.025	BCX	0.024	0.0082	BCX	0.0040
3 Soil	J1CXX9	12/9/2010	0.0049	BM	0.0030	0.076	B	0.013	0.024	U	0.024	0.0070	BC	0.0040
6 Soil with amber oil	J1CY07	12/9/2010	0.0030	U	0.0030	0.23	B	0.013	0.027	B	0.024	0.0041	BCMX	0.0040
4 Tar substance	J1CY08	12/9/2010	0.0048	B	0.0030	0.19	B	0.013	0.024	U	0.024	0.0074	BCMX	0.0040
1 Soil with diesel oil	J1K8D8	7/26/2011	0.0031	B	0.0030	55.8		0.013	0.024	U	0.024	0.0049	B	0.0040
1 Soil with diesel oil	J1LHM8	10/10/2011	0.0030	U	0.0030	0.013	U	0.013	0.024	U	0.024	0.0040	U	0.0040

Table B-4: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - TCLP SVOA (Page 2 of 2).

LOCATION	HEIS Number	Sample Date	1,4-Dichlorobenzene			2,4,5-Trichlorophenol			2,4,6-Trichlorophenol			2,4-Dinitrotoluene		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
1 Black substance	J1CP25	12/9/2010	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0083	U	0.0083
5 Soil under 55-gl drum	J1CXN7	12/9/2010	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0083	U	0.0083
2 Black substance	J1CXP9	12/9/2010	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0083	U	0.0083
7 Soil with bunker oil	J1CXX6	12/9/2010	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0083	U	0.0083
6 Soil with amber oil	J1CY07	12/9/2010	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0083	U	0.0083
4 Tar substance	J1CY08	12/9/2010	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0083	U	0.0083

LOCATION	HEIS Number	Sample Date	2-Methylphenol (cresol, o-)			3+4 Methylphenol (cresol, m+p)			Hexachlorobenzene			Hexachlorobutadiene		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
1 Black substance	J1CP25	12/9/2010	0.0069	J	0.0049	0.0052	J	0.0012	0.0033	U	0.0033	0.016	U	0.016
5 Soil under 55-gl drum	J1CXN7	12/9/2010	0.0049	U	0.0049	0.0012	U	0.0012	0.0033	U	0.0033	0.016	U	0.016
2 Black substance	J1CXP9	12/9/2010	0.0049	U	0.0049	0.0012	U	0.0012	0.0033	U	0.0033	0.016	U	0.016
7 Soil with bunker oil	J1CXX6	12/9/2010	0.030	J	0.0049	0.033	J	0.0012	0.0033	U	0.0033	0.016	U	0.016
6 Soil with amber oil	J1CY07	12/9/2010	0.0049	U	0.0049	0.0012	U	0.0012	0.0033	U	0.0033	0.016	U	0.016
4 Tar substance	J1CY08	12/9/2010	0.029	J	0.0049	0.044	J	0.0012	0.0033	U	0.0033	0.016	U	0.016

LOCATION	HEIS Number	Sample Date	Hexachloroethane			Nitrobenzene			Pentachlorophenol			Pyridine		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
1 Black substance	J1CP25	12/9/2010	0.010	U	0.010	0.0040	U	0.0040	0.0050	U	0.0050	0.0056	U	0.0056
5 Soil under 55-gl drum	J1CXN7	12/9/2010	0.010	U	0.010	0.0040	U	0.0040	0.0050	U	0.0050	0.0056	U	0.0056
2 Black substance	J1CXP9	12/9/2010	0.010	U	0.010	0.0040	U	0.0040	0.0050	U	0.0050	0.0056	U	0.0056
7 Soil with bunker oil	J1CXX6	12/9/2010	0.010	U	0.010	0.0040	U	0.0040	0.0050	U	0.0050	0.0056	U	0.0056
6 Soil with amber oil	J1CY07	12/9/2010	0.010	U	0.010	0.0040	U	0.0040	0.0050	U	0.0050	0.0056	U	0.0056
4 Tar substance	J1CY08	12/9/2010	0.010	U	0.010	0.0040	U	0.0040	0.0050	U	0.0050	0.0056	U	0.0056

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 1 of 18).

CONSTITUENT	CLASS	Stockpile A-5			Stockpile A-6			1 Black substance			4 Tar substance			5 Soil under 55-gl			6 Soil under amber oil		
		J1CCW6			J1CCW7			J1CP25			J1CY08			J1CXN7			J1CY07		
		10/6/2010			10/6/2010			12/9/2010			12/9/2010			12/9/2010			12/9/2010		
		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	399	D	17.2	3.63	U	3.63	8800	D	3500	72000	DY	2100	920	DX	53	10000	DX	220
Acenaphthylene	PAH	17.2	U	17.2	3.63	U	3.63	3100	UD	3100	1900	UD	1900	48	UD	48	200	UD	200
Anthracene	PAH	86.2	D	17.2	3.63	U	3.63	1100	UD	1100	400000	DX	650	3100	DX	16	5500	DX	67
Benzo(a)anthracene	PAH	324	D	17.2	6.26		3.63	1100	UD	1100	680	UD	680	4700	D	17	22000	D	70
Benzo(a)pyrene	PAH	207	D	17.2	1.14	J	3.63	170000	DY	2200	85000	DX	1400	4400	D	34	22000	D	140
Benzo(b)fluoranthene	PAH	180	D	17.2	3.63	U	3.63	1500	UD	1500	71000	DX	900	3800	D	22	19000	DX	92
Benzo(ghi)perylene	PAH	116	D	17.2	3.63	U	3.63	2500	UD	2500	1500	UD	1500	2100	D	38	11000	D	160
Benzo(k)fluoranthene	PAH	17.2	U	17.2	3.63	U	3.63	100000	DY	1400	63000	DY	850	2100	D	21	11000	D	86
Chrysene	PAH	17.2	U	17.2	2.6	J	3.63	2500	D	1700	1000	UD	1000	5900	D	26	43000	XD	110
Dibenz[a,h]anthracene	PAH	14.7	JD	17.2	3.63	U	3.63	3800	UD	3800	2400	UD	2400	1200	DX	59	1500	DX	240
Fluoranthene	PAH	539	D	17.2	3.63	U	3.63	4500	UD	4500	2800	UD	2800	8400	DX	69	40000	DX	280
Fluorene	PAH	17.2	U	17.2	3.63	U	3.63	1800	UD	1800	630000	DX	1100	910	DX	28	5600	D	120
Indeno(1,2,3-cd)pyrene	PAH	90.6	D	17.2	3.63	U	3.63	4200	UD	4200	2600	UD	2600	2400	D	64	11000	DX	260
Naphthalene	PAH	17.2	U	17.2	3.63	U	3.63	360000	D	4200	170000	D	2600	3300	D	64	3500	D	260
Phenanthrene	PAH	360	D	17.2	1.34	J	3.63	35000	DX	4200	1100000	DX	2600	7300	DX	64	32000	D	260
Pyrene	PAH	769	D	17.2	3.63	U	3.63	4200	UD	4200	2600	UD	2600	16000	D	64	46000	DX	260

CONSTITUENT	CLASS	7 Soil with bunker oil			EX-A1			EX-A2			EX-A3			EX-A4			EX-A5		
		J1CXX6			J1H221			J1H222			J1H223			J1H224			J1H225		
		12/9/2010			4/12/2011			4/12/2011			4/12/2011			4/12/2011			4/12/2011		
		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	34000	D	1700	10	U	10	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8	9.7	U	9.7
Acenaphthylene	PAH	1500	UD	1500	9.0	U	9.0	8.6	U	8.6	8.9	U	8.9	8.8	U	8.8	8.8	U	8.8
Anthracene	PAH	520	UD	520	3.1	U	3.1	2.9	U	2.9	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0
Benzo(a)anthracene	PAH	540	UD	540	3.2	U	3.2	3.0	U	3.0	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1
Benzo(a)pyrene	PAH	23000	DX	1100	6.4	U	6.4	6.1	U	6.1	6.3	U	6.3	6.3	U	6.3	56		6.2
Benzo(b)fluoranthene	PAH	22000	DX	710	4.2	U	4.2	4.0	U	4.0	4.2	U	4.2	4.1	U	4.1	41	X	4.1
Benzo(ghi)perylene	PAH	1200	UD	1200	7.2	U	7.2	6.9	U	6.9	7.1	U	7.1	7.1	U	7.1	13	J	7.0
Benzo(k)fluoranthene	PAH	20000	DY	670	3.9	U	3.9	3.8	U	3.8	3.9	U	3.9	3.9	U	3.9	18		3.8
Chrysene	PAH	820	UD	820	4.8	U	4.8	4.6	U	4.6	4.8	U	4.8	4.7	U	4.7	53		4.7
Dibenz[a,h]anthracene	PAH	1900	UD	1900	11	U	11	10	U	10	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	2200	UD	2200	13	U	13	12	U	12	13	U	13	13	U	13	96		13
Fluorene	PAH	130000	D	890	5.3	U	5.3	5.0	U	5.0	5.2	U	5.2	5.2	U	5.2	5.1	U	5.1
Indeno(1,2,3-cd)pyrene	PAH	2000	UD	2000	12	U	12	11	U	11	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	240000	D	2000	12	U	12	11	U	11	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	390000	D	2000	12	U	12	11	U	11	12	U	12	12	U	12	40	X	12
Pyrene	PAH	2000	UD	2000	12	U	12	11	U	11	12	U	12	12	U	12	87	X	12

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 2 of 18).

CONSTITUENT	CLASS	1 Soil near B-25			2 Soil with bunker oil			3 Soil with diesel oil			1 Soil with diesel oil			Anomaly Staging Area-1			Anomaly Staging Area-2		
		J1JW43			J1JW44			J1JW45			J1LJF0			J1P286			J1P287		
		6/27/2011			6/27/2011			6/27/2011			11/28/2011			5/14/12			5/14/12		
		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	50	UD	50	10	U	10	4200	DX	50	9.6	U	9.6	10	U	10	11	U	11
Acenaphthylene	PAH	45	UD	45	9.3	U	9.3	45	UD	45	8.7	U	8.7	9.4	U	9.4	9.5	U	9.5
Anthracene	PAH	15	UD	15	3.2	U	3.2	15	UD	15	2.9	U	2.9	6.3	J	3.2	8.1	J	3.2
Benzo(a)anthracene	PAH	260	D	16	18		3.3	16	UD	16	3.1	U	3.1	24		3.3	33		3.4
Benzo(a)pyrene	PAH	310	D	32	15	J	6.7	32	UD	32	6.2	U	6.2	22		6.7	33		6.8
Benzo(b)fluoranthene	PAH	200	D	21	16		4.4	21	UD	21	4.0	U	4.0	24		4.4	36		4.4
Benzo(ghi)perylene	PAH	110	JD	36	7.5	U	7.5	36	UD	36	6.9	U	6.9	17	J	7.5	27	J	7.6
Benzo(k)fluoranthene	PAH	72	JDX	20	7.9	J	4.1	20	UD	20	3.8	U	3.8	10	J	4.1	14	J	4.2
Chrysene	PAH	230	D	24	18	J	5.0	10000	DX	24	4.7	U	4.7	24	J	5.0	34	J	5.1
Dibenz[a,h]anthracene	PAH	55	UD	55	11	U	11	55	UD	55	11	U	11	11	U	11	12	U	12
Fluoranthene	PAH	220	D	65	22	J	13	16000	D	65	13	U	13	36	J	14	48		14
Fluorene	PAH	27	UD	27	5.5	U	5.5	4900	D	26	5.1	U	5.1	5.5	U	5.5	5.6	U	5.6
Indeno(1,2,3-cd)pyrene	PAH	160	D	60	12	J	12	60	UD	60	12	U	12	14	J	12	20	J	13
Naphthalene	PAH	60	UD	60	12	U	12	60	UD	60	12	U	12	12	U	12	13	U	13
Phenanthrene	PAH	98	JD	60	12	U	12	18000	D	60	12	U	12	21	J	12	20	J	13
Pyrene	PAH	200	DX	60	30	J	12	14000	DX	60	12	U	12	36	J	12	58		13

CONSTITUENT	CLASS	SPA-3			SPA-4			SPA-5		
		J1P288			J1P289			J1P290		
		5/14/12			5/14/12			5/14/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	670	DX	59	210	X	9.8	9.9	U	9.9
Acenaphthylene	PAH	120	JDX	53	8.9	U	8.9	8.9	U	8.9
Anthracene	PAH	2400	D	18	620		3.0	3.0	U	3.0
Benzo(a)anthracene	PAH	4300	D	19	1100		3.1	3.1	U	3.1
Benzo(a)pyrene	PAH	3400	D	38	970		6.3	34	X	6.3
Benzo(b)fluoranthene	PAH	3200	DX	25	960	X	4.1	4.1	U	4.1
Benzo(ghi)perylene	PAH	2200	D	42	660		7.1	7.1	U	7.1
Benzo(k)fluoranthene	PAH	1800	D	23	420		3.9	200		3.9
Chrysene	PAH	4500	D	28	1300		4.8	300		4.8
Dibenz[a,h]anthracene	PAH	500	D	65	200	X	11	11	U	11
Fluoranthene	PAH	9100	D	77	2400		13	160		13
Fluorene	PAH	1200	D	31	370		5.2	30		5.2
Indeno(1,2,3-cd)pyrene	PAH	2000	D	71	590		12	12	U	12
Naphthalene	PAH	71	U	71	12	U	12	12	U	12
Phenanthrene	PAH	6700	D	71	1800		12	14	JX	12
Pyrene	PAH	9700	D	71	2700		12	140		12

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 3 of 18).

CONSTITUENT	CLASS	Stockpile A-1			Stockpile A-2			Stockpile A-3			Stockpile A-4			Stockpile A-5			Stockpile A-6			1 Black substance		
		J1BYV7			J1BYV8			J1BYV9			J1BYW0			J1CCW6			J1CCW7			J1CP25		
		8/5/2010			8/5/2010			8/5/2010			8/5/2010			10/6/2010			10/6/2010			12/9/2010		
		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	27.4	UD	27.4	14.2	U	14.2	73.3	UD	73.3	14.7	U	14.7	14	U	14	14.2	U	14.2			
Aroclor-1221	PCB	27.4	UD	27.4	14.2	U	14.2	73.3	UD	73.3	14.7	U	14.7	14	U	14	14.2	U	14.2			
Aroclor-1232	PCB	27.4	UD	27.4	14.2	U	14.2	73.3	UD	73.3	14.7	U	14.7	14	U	14	14.2	U	14.2			
Aroclor-1242	PCB	27.4	UD	27.4	14.2	U	14.2	73.3	UD	73.3	14.7	U	14.7	14	U	14	14.2	U	14.2			
Aroclor-1248	PCB	27.4	UD	27.4	14.2	U	14.2	73.3	UD	73.3	14.7	U	14.7	14	U	14	14.2	U	14.2			
Aroclor-1254	PCB	140	D	27.4	28.6		14.2	573	D	73.3	136		14.7	33.4		14	14.2	U	14.2			
Aroclor-1260	PCB	272	D	27.4	34.3		14.2	1090	D	73.3	293		14.7	102		14	14.2	U	14.2			

CONSTITUENT	CLASS	2 Black substance			4 Tar substance			5 Soil under 55-gl drum			6 Soil under amber oil			7 Soil with bunker oil			EX-A1			EX-A2		
		J1CXP9			J1CY08			J1CXN7			J1CY07			J1CXX6			J1H221			J1H222		
		12/9/2010			12/9/2010			12/9/2010			12/9/2010			12/9/2010			4/12/2011			4/12/2011		
		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				120	U	120				3.0	U	3.0	94	U	94	2.7	U	2.7	2.7	U	2.7
Aroclor-1221	PCB				340	U	340				8.7	U	8.7	270	U	270	7.8	U	7.8	7.8	U	7.8
Aroclor-1232	PCB				86	U	86				2.2	U	2.2	68	U	68	1.9	U	1.9	1.9	U	1.9
Aroclor-1242	PCB				200	U	200				5.1	U	5.1	160	U	160	4.5	U	4.5	4.5	U	4.5
Aroclor-1248	PCB				200	U	200				5.1	U	5.1	160	U	160	4.5	U	4.5	4.5	U	4.5
Aroclor-1254	PCB				110	U	110				2.8	U	2.8	88	U	88	2.5	U	2.5	2.5	U	2.5
Aroclor-1260	PCB				110	UN	110				69	N	2.8	88	U	88	2.5	U	2.5	2.5	U	2.5

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 4 of 18).

CONSTITUENT	CLASS	EX-A3			EX-A4			EX-A5			1 Soil near B-25			2 Soil with bunker oil			3 Soil with diesel oil			1 Soil with diesel oil		
		J1H223			J1H224			J1H225			J1JW43			J1JW44			J1JW45			J1LJF0		
		4/12/2011			4/12/2011			4/12/2011			6/27/2011			6/27/2011			6/27/2011			11/28/2011		
		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	UN	2.8	14	UD	14	14	UD	14	27	UD	27	2.7	U	2.7
Aroclor-1221	PCB	8.1	U	8.1	8.1	U	8.1	8.0	U	8.0	40	UD	40	41	UD	41	77	UD	77	8.0	U	8.0
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	10	UD	10	10	UD	10	19	UD	19	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	23	UD	23	24	UD	24	45	UD	45	4.6	U	4.6
Aroclor-1248	PCB	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	23	UD	23	24	UD	24	45	UD	45	4.6	U	4.6
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	13	UD	13	13	UD	13	25	UD	25	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	22	N	2.6	13	UD	13	13	UD	13	25	UD	25	2.6	U	2.6

CONSTITUENT	CLASS	Anomaly Staging			Anomaly Staging			SPA-3			SPA-4			SPA-5		
		J1P286			J1P287			J1P288			J1P289			J1P290		
		5/14/12 10:05			5/14/12 10:10			5/14/12 10:15			5/14/12 9:52			5/14/12 10:20		
		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	2.9	U	2.9	3.3	U	3.3	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8.1	U	8.1	8.4	U	8.4	9.7	U	9.7	8.0	U	8.0	8.0	U	8.0
Aroclor-1232	PCB	2.0	U	2.0	2.1	U	2.1	2.4	U	2.4	2.0	U	2.0	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	4.9	U	4.9	5.6	U	5.6	4.7	U	4.7	4.7	U	4.7
Aroclor-1248	PCB	4.7	U	4.7	4.9	U	4.9	5.6	U	5.6	4.7	U	4.7	4.7	U	4.7
Aroclor-1254	PCB	2.6	U	2.6	2.7	U	2.7	3.1	U	3.1	9.3	J	2.6	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.7	U	2.7	14		3.1	6.1	J	2.6	2.6	U	2.6

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 5 of 18) .

CONSTITUENT	CLASS	Stockpile A-1			Stockpile A-2			Stockpile A-3			Stockpile A-4		
		J1BYV7			J1BYV8			J1BYV9			J1BYW0		
		8/5/2010			8/5/2010			8/5/2010			8/5/2010		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
1,2-Dichlorobenzene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
1,3-Dichlorobenzene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
1,4-Dichlorobenzene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2,4,5-Trichlorophenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2,4,6-Trichlorophenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2,4-Dichlorophenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2,4-Dimethylphenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2,4-Dinitrophenol	SVOA	5250	UD	5250	5320	UD	5320	5400	UD	5400	5470	UD	5470
2,4-Dinitrotoluene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2,6-Dinitrotoluene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2-Chloronaphthalene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2-Chlorophenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2-Methylnaphthalene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2-Methylphenol (cresol, o-)	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
2-Nitroaniline	SVOA	5250	UD	5250	5320	UD	5320	5400	UD	5400	5470	UD	5470
2-Nitrophenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
3+4 Methylphenol (cresol, m+p)	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	280	JD	1090
3,3'-Dichlorobenzidine	SVOA	2100	UD	2100	2130	UD	2130	2160	UD	2160	2190	UD	2190
3-Nitroaniline	SVOA	5250	UD	5250	5320	UD	5320	5400	UD	5400	5470	UD	5470
4,6-Dinitro-2-methylphenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
4-Bromophenylphenyl ether	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
4-Chloro-3-methylphenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
4-Chloroaniline	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
4-Chlorophenylphenyl ether	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
4-Nitroaniline	SVOA	5250	UD	5250	5320	UD	5320	5400	UD	5400	5470	UD	5470
4-Nitrophenol	SVOA	5250	UD	5250	5320	UD	5320	5400	UD	5400	5470	UD	5470
Acenaphthene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Acenaphthylene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Anthracene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	375	JD	1090
Benzo(a)anthracene	SVOA	162	JD	1050	1060	UD	1060	526	JD	1080	3050	D	1090
Benzo(a)pyrene	SVOA	1050	UD	1050	1060	UD	1060	466	JD	1080	2090	D	1090
Benzo(b)fluoranthene	SVOA	1050	UD	1050	1060	UD	1060	401	JD	1080	1900	D	1090
Benzo(ghi)perylene	SVOA	1050	UD	1050	1060	UD	1060	336	JD	1080	1290	D	1090
Benzo(k)fluoranthene	SVOA	1050	UD	1050	1060	UD	1060	424	JD	1080	1710	D	1090
Bis(2-chloro-1-methylethyl)ether	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Bis(2-Chloroethoxy)methane	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Bis(2-chloroethyl) ether	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Bis(2-ethylhexyl) phthalate	SVOA	646	JD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Butylbenzylphthalate	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Carbazole	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	336	JD	1090
Chrysene	SVOA	219	JD	1050	1060	UD	1060	702	JD	1080	2810	D	1090
Di-n-butylphthalate	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Di-n-octylphthalate	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Dibenz[a,h]anthracene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	734	JD	1090
Dibenzofuran	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Diethyl phthalate	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Dimethyl phthalate	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Fluoranthene	SVOA	269	JD	1050	1060	UD	1060	1010	JD	1080	4300	D	1090
Fluorene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 6 of 18).

CONSTITUENT	CLASS	Stockpile A-1			Stockpile A-2			Stockpile A-3			Stockpile A-4		
		J1BYV7			J1BYV8			J1BYV9			J1BYW0		
		8/5/2010			8/5/2010			8/5/2010			8/5/2010		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Hexachlorobutadiene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Hexachlorocyclopentadiene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Hexachloroethane	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Indeno(1,2,3-cd)pyrene	SVOA	1050	UD	1050	1060	UD	1060	291	JD	1080	1300	D	1090
Isophorone	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
N-Nitroso-di-n-dipropylamine	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
N-Nitrosodiphenylamine	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Naphthalene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Nitrobenzene	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Pentachlorophenol	SVOA	5250	UD	5250	5320	UD	5320	5400	UD	5400	5470	UD	5470
Phenanthrene	SVOA	165	JD	1050	1060	UD	1060	838	JD	1080	726	JD	1090
Phenol	SVOA	1050	UD	1050	1060	UD	1060	1080	UD	1080	1090	UD	1090
Pyrene	SVOA	224	JD	1050	1060	UD	1060	689	JD	1080	3480	D	1090
1,1,1-Trichloroethane	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
1,1,2,2-Tetrachloroethane	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
1,1,2-Trichloroethane	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
1,1-Dichloroethane	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
1,1-Dichloroethene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
1,2-Dichloroethane	VOA	6.02	U	6.02	5.99	U	5.99	5.95	U	5.95	6.23	U	6.23
1,2-Dichloroethene(Total)	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
1,2-Dichloropropane	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
2-Butanone	VOA	12.0	U	12.0	12.0	U	12.0	11.9	U	11.9	12.5	U	12.5
2-Hexanone	VOA	12.0	U	12.0	12.0	U	12.0	11.9	U	11.9	12.5	U	12.5
4-Methyl-2-Pentanone	VOA	12.0	U	12.0	12.0	U	12.0	11.9	U	11.9	12.5	U	12.5
Acetone	VOA	12.0	U	12.0	12.0	U	12.0	11.9	U	11.9	12.5	U	12.5
Benzene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Bromodichloromethane	VOA	6.02	U	6.02	5.99	U	5.99	5.95	U	5.95	6.23	U	6.23
Bromoform	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Bromomethane	VOA	10.0	U	10.0	9.99	U	9.99	9.92	U	9.92	10.4	U	10.4
Carbon disulfide	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Carbon tetrachloride	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Chlorobenzene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Chloroethane	VOA	10.0	U	10.0	9.99	U	9.99	9.92	U	9.92	10.4	U	10.4
Chloroform	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Chloromethane	VOA	10.0	U	10.0	9.99	U	9.99	9.92	U	9.92	10.4	U	10.4
cis-1,2-Dichloroethylene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
cis-1,3-Dichloropropene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Dibromochloromethane	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Ethylbenzene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Methylenechloride	VOA	6.02	U	6.02	5.99	U	5.99	5.95	U	5.95	6.23	U	6.23
Styrene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Tetrachloroethene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Toluene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
trans-1,2-Dichloroethylene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
trans-1,3-Dichloropropene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Trichloroethene	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19
Vinyl chloride	VOA	10.0	U	10.0	9.99	U	9.99	9.92	U	9.92	10.4	U	10.4
Xylenes (total)	VOA	5.02	U	5.02	4.99	U	4.99	4.96	U	4.96	5.19	U	5.19

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 7 of 18) .

CONSTITUENT	CLASS	Stockpile A-5			Stockpile A-6			1 Black substance			2 Black substance		
		J1CCW6			J1CCW7			J1CP25			J1CXP9		
		10/6/2010			10/6/2010			12/9/2010			12/9/2010		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	2780	UD	2780	355	U	355	16000	UD	16000	1400	U	1400
1,2-Dichlorobenzene	SVOA	2780	UD	2780	355	U	355	13000	UD	13000	1100	U	1100
1,3-Dichlorobenzene	SVOA	2780	UD	2780	355	U	355	7000	UD	7000	610	U	610
1,4-Dichlorobenzene	SVOA	2780	UD	2780	355	U	355	8000	UD	8000	690	U	690
2,4,5-Trichlorophenol	SVOA	2780	UD	2780	355	U	355	5900	UD	5900	510	U	510
2,4,6-Trichlorophenol	SVOA	2780	UD	2780	355	U	355	5900	UD	5900	510	U	510
2,4-Dichlorophenol	SVOA	2780	UD	2780	355	U	355	5900	UD	5900	510	U	510
2,4-Dimethylphenol	SVOA	2780	UD	2780	355	U	355	39000	UD	39000	3300	U	3300
2,4-Dinitrophenol	SVOA	13900	UD	13900	1780	U	1780	190000	UD	190000	17000	U	17000
2,4-Dinitrotoluene	SVOA	2780	UD	2780	355	U	355	39000	UD	39000	3300	U	3300
2,6-Dinitrotoluene	SVOA	2780	UD	2780	355	U	355	16000	UD	16000	1400	U	1400
2-Chloronaphthalene	SVOA	2780	UD	2780	355	U	355	5900	UD	5900	510	U	510
2-Chlorophenol	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1100	U	1100
2-Methylnaphthalene	SVOA	2780	UD	2780	355	U	355	32000	JD	11000	960	U	960
2-Methylphenol (cresol, o-)	SVOA	2780	UD	2780	355	U	355	7600	UD	7600	660	U	660
2-Nitroaniline	SVOA	13900	UD	13900	1780	U	1780	29000	UD	29000	2500	U	2500
2-Nitrophenol	SVOA	2780	UD	2780	355	U	355	5900	UD	5900	510	U	510
3+4 Methylphenol (cresol, m+p)	SVOA	2780	UD	2780	355	U	355	19000	UD	19000	1700	U	1700
3,3'-Dichlorobenzidine	SVOA	5560	UD	5560	711	U	711	53000	UD	53000	4600	U	4600
3-Nitroaniline	SVOA	13900	UD	13900	1780	U	1780	43000	UD	43000	3700	U	3700
4,6-Dinitro-2-methylphenol	SVOA	2780	UD	2780	355	U	355	190000	UD	190000	17000	U	17000
4-Bromophenylphenyl ether	SVOA	2780	UD	2780	355	U	355	11000	UD	11000	960	U	960
4-Chloro-3-methylphenol	SVOA	2780	UD	2780	355	U	355	39000	UD	39000	3300	U	3300
4-Chloroaniline	SVOA	2780	UD	2780	355	U	355	48000	UD	48000	4100	U	4100
4-Chlorophenylphenyl ether	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1100	U	1100
4-Nitroaniline	SVOA	13900	UD	13900	1780	U	1780	42000	UD	42000	3700	U	3700
4-Nitrophenol	SVOA	13900	UD	13900	1780	U	1780	57000	UD	57000	4900	U	4900
Acenaphthene	SVOA	2780	UD	2780	355	U	355	6000	UD	6000	520	U	520
Acenaphthylene	SVOA	2780	UD	2780	355	U	355	10000	UD	10000	860	U	860
Anthracene	SVOA	2780	UD	2780	355	U	355	10000	UD	10000	860	UX	860
Benzo(a)anthracene	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1000	U	1000
Benzo(a)pyrene	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1000	U	1000
Benzo(b)fluoranthene	SVOA	2780	UD	2780	355	U	355	15000	UD	15000	1300	U	1300
Benzo(ghi)perylene	SVOA	2780	UD	2780	355	U	355	9400	UD	9400	810	U	810
Benzo(k)fluoranthene	SVOA	2780	UD	2780	355	U	355	23000	UD	23000	2000	U	2000
Bis(2-chloro-1-methylethyl)ether	SVOA	2780	UD	2780	355	U	355	13000	UD	13000	1200	U	1200
Bis(2-Chloroethoxy)methane	SVOA	2780	UD	2780	355	U	355	13000	UD	13000	1200	U	1200
Bis(2-chloroethyl) ether	SVOA	2780	UD	2780	355	U	355	9700	UD	9700	840	U	840
Bis(2-ethylhexyl) phthalate	SVOA	2780	UD	2780	355	U	355	27000	UD	27000	2300	U	2300
Butylbenzylphthalate	SVOA	2780	UD	2780	355	U	355	25000	UD	25000	2200	U	2200
Carbazole	SVOA	2780	UD	2780	355	U	355	21000	UD	21000	1800	U	1800
Chrysene	SVOA	2780	UD	2780	355	U	355	16000	UD	16000	1400	U	1400
Di-n-butylphthalate	SVOA	2780	UD	2780	355	U	355	17000	UD	17000	1500	U	1500
Di-n-octylphthalate	SVOA	2780	UD	2780	355	U	355	8400	UD	8400	730	U	730
Dibenz[a,h]anthracene	SVOA	2780	UD	2780	355	U	355	11000	UD	11000	960	U	960
Dibenzofuran	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1000	U	1000
Diethyl phthalate	SVOA	2780	UD	2780	355	U	355	15000	UD	15000	1300	U	1300
Dimethyl phthalate	SVOA	2780	UD	2780	355	U	355	13000	UD	13000	1200	U	1200
Fluoranthene	SVOA	2780	UD	2780	355	U	355	21000	UD	21000	1800	U	1800
Fluorene	SVOA	2780	UD	2780	355	U	355	11000	UD	11000	910	U	910

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 8 of 18) .

CONSTITUENT	CLASS	Stockpile A-5			Stockpile A-6			1 Black substance			2 Black substance		
		J1CCW6			J1CCW7			J1CP25			J1CXP9		
		10/6/2010			10/6/2010			12/9/2010			12/9/2010		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	2780	UD	2780	355	U	355	17000	UD	17000	1500	U	1500
Hexachlorobutadiene	SVOA	2780	UD	2780	355	U	355	5900	UD	5900	510	U	510
Hexachlorocyclopentadiene	SVOA	2780	UD	2780	355	U	355	29000	UD	29000	2500	U	2500
Hexachloroethane	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1100	U	1100
Indeno(1,2,3-cd)pyrene	SVOA	2780	UD	2780	355	U	355	13000	UD	13000	1100	U	1100
Isophorone	SVOA	2780	UD	2780	355	U	355	10000	UD	10000	860	U	860
N-Nitroso-di-n-dipropylamine	SVOA	2780	UD	2780	355	U	355	18000	UD	18000	1600	U	1600
N-Nitrosodiphenylamine	SVOA	2780	UD	2780	355	U	355	12000	UD	12000	1100	U	1100
Naphthalene	SVOA	2780	UD	2780	355	U	355	170000	JD	18000	1600	U	1600
Nitrobenzene	SVOA	2780	UD	2780	355	U	355	13000	UD	13000	1100	U	1100
Pentachlorophenol	SVOA	13900	UD	13900	1780	U	1780	190000	UD	190000	17000	U	17000
Phenanthrene	SVOA	2780	UD	2780	355	U	355	10000	UD	10000	860	U	860
Phenol	SVOA	2780	UD	2780	355	U	355	11000	UD	11000	910	U	910
Pyrene	SVOA	2780	UD	2780	355	U	355	7100	UD	7100	610	U	610
1,1,1-Trichloroethane	VOA	5.01	U	5.01	5.45	U	5.45						
1,1,2,2-Tetrachloroethane	VOA	5.01	U	5.01	5.45	U	5.45						
1,1,2-Trichloroethane	VOA	5.01	U	5.01	5.45	U	5.45						
1,1-Dichloroethane	VOA	5.01	U	5.01	5.45	U	5.45						
1,1-Dichloroethene	VOA	5.01	U	5.01	5.45	U	5.45						
1,2-Dichloroethane	VOA	6.02	U	6.02	6.54	U	6.54						
1,2-Dichloroethene(Total)	VOA	5.01	U	5.01	5.45	U	5.45						
1,2-Dichloropropane	VOA	5.01	U	5.01	5.45	U	5.45						
2-Butanone	VOA	12.0	U	12.0	13.1	U	13.1						
2-Hexanone	VOA	12.0	U	12.0	13.1	U	13.1						
4-Methyl-2-Pentanone	VOA	12.0	U	12.0	13.1	U	13.1						
Acetone	VOA	12.0	U	12.0	13.1	U	13.1						
Benzene	VOA	5.01	U	5.01	5.45	U	5.45						
Bromodichloromethane	VOA	6.02	U	6.02	6.54	U	6.54						
Bromoform	VOA	5.01	U	5.01	5.45	U	5.45						
Bromomethane	VOA	10.0	U	10.0	10.9	U	10.9						
Carbon disulfide	VOA	5.01	U	5.01	5.45	U	5.45						
Carbon tetrachloride	VOA	5.01	U	5.01	5.45	U	5.45						
Chlorobenzene	VOA	5.01	U	5.01	5.45	U	5.45						
Chloroethane	VOA	10.0	U	10.0	10.9	U	10.9						
Chloroform	VOA	5.01	U	5.01	5.45	U	5.45						
Chloromethane	VOA	10.0	U	10.0	10.9	U	10.9						
cis-1,2-Dichloroethylene	VOA	5.01	U	5.01	5.45	U	5.45						
cis-1,3-Dichloropropene	VOA	5.01	U	5.01	5.45	U	5.45						
Dibromochloromethane	VOA	5.01	U	5.01	5.45	U	5.45						
Ethylbenzene	VOA	5.01	U	5.01	5.45	U	5.45						
Methylenechloride	VOA	6.04	B	6.02	6.55	B	6.54						
Styrene	VOA	5.01	U	5.01	5.45	U	5.45						
Tetrachloroethene	VOA	5.01	U	5.01	5.45	U	5.45						
Toluene	VOA	5.01	U	5.01	5.45	U	5.45						
trans-1,2-Dichloroethylene	VOA	5.01	U	5.01	5.45	U	5.45						
trans-1,3-Dichloropropene	VOA	5.01	U	5.01	5.45	U	5.45						
Trichloroethene	VOA	5.01	U	5.01	5.45	U	5.45						
Vinyl chloride	VOA	10.0	U	10.0	10.9	U	10.9						
Xylenes (total)	VOA	5.01	U	5.01	5.45	U	5.45						

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 9 of 18).

CONSTITUENT	CLASS	4 Tar substance			5 Soil under 55-gl drum			6 Soil under amber oil			7 Soil with bunker oil		
		J1CY08			J1CXN7			J1CY07			J1CXX6		
		12/9/2010			12/9/2010			12/9/2010			12/9/2010		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27000	UD	27000	3600	UD	3600	310	UD	310	8600	UD	8600
1,2-Dichlorobenzene	SVOA	21000	UD	21000	2800	UD	2800	240	UD	240	6800	UD	6800
1,3-Dichlorobenzene	SVOA	11000	UD	11000	1500	UD	1500	130	UD	130	3700	UD	3700
1,4-Dichlorobenzene	SVOA	13000	UD	13000	1800	UD	1800	150	UD	150	4200	UD	4200
2,4,5-Trichlorophenol	SVOA	9500	UD	9500	1300	UD	1300	110	UD	110	3100	UD	3100
2,4,6-Trichlorophenol	SVOA	9500	UD	9500	1300	UD	1300	110	UD	110	3100	UD	3100
2,4-Dichlorophenol	SVOA	9500	UD	9500	1300	UD	1300	110	UD	110	3100	UD	3100
2,4-Dimethylphenol	SVOA	63000	UD	63000	8500	UD	8500	720	UD	720	20000	UD	20000
2,4-Dinitrophenol	SVOA	320000	UD	320000	43000	UD	43000	3700	UD	3700	100000	UD	100000
2,4-Dinitrotoluene	SVOA	63000	UD	63000	8500	UD	8500	720	UD	720	20000	UD	20000
2,6-Dinitrotoluene	SVOA	27000	UD	27000	3600	UD	3600	310	UD	310	8600	UD	8600
2-Chloronaphthalene	SVOA	9500	UD	9500	1300	UD	1300	110	UD	110	3100	UD	3100
2-Chlorophenol	SVOA	20000	UD	20000	2700	UD	2700	230	UD	230	6500	UD	6500
2-Methylnaphthalene	SVOA	1200000	D	18000	2700	JD	2400	710	JD	210	670000	D	5800
2-Methylphenol (cresol, o-)	SVOA	12000	UD	12000	1700	UD	1700	140	UD	140	4000	UD	4000
2-Nitroaniline	SVOA	48000	UD	48000	6400	UD	6400	550	UD	550	15000	UD	15000
2-Nitrophenol	SVOA	9500	UD	9500	1300	UD	1300	110	UD	110	3100	UD	3100
3+4 Methylphenol (cresol, m+p)	SVOA	31000	UD	31000	4200	UD	4200	360	UD	360	10000	UD	10000
3,3'-Dichlorobenzidine	SVOA	86000	UD	86000	12000	UD	12000	990	UD	990	28000	UD	28000
3-Nitroaniline	SVOA	70000	UD	70000	9400	UD	9400	800	UD	800	22000	UD	22000
4,6-Dinitro-2-methylphenol	SVOA	310000	UD	310000	42000	UD	42000	3600	UD	3600	100000	UD	100000
4-Bromophenylphenyl ether	SVOA	18000	UD	18000	2400	UD	2400	210	UD	210	5800	UD	5800
4-Chloro-3-methylphenol	SVOA	63000	UD	63000	8500	UD	8500	720	UD	720	20000	UD	20000
4-Chloroaniline	SVOA	78000	UD	78000	11000	UD	11000	900	UD	900	25000	UD	25000
4-Chlorophenylphenyl ether	SVOA	20000	UD	20000	2700	UD	2700	230	UD	230	6500	UD	6500
4-Nitroaniline	SVOA	69000	UD	69000	9300	UD	9300	800	UD	800	22000	UD	22000
4-Nitrophenol	SVOA	93000	UD	93000	12000	UD	12000	1100	UD	1100	30000	UD	30000
Acenaphthene	SVOA	150000	JD	9800	1300	UD	1300	3700	D	110	46000	JD	3200
Acenaphthylene	SVOA	25000	JD	16000	2200	UD	2200	190	UD	190	5200	UD	5200
Anthracene	SVOA	180000	JD	16000	2200	UD	2200	8900	D	190	45000	JD	5200
Benzo(a)anthracene	SVOA	99000	JD	19000	2700	JD	2600	25000	D	220	27000	JD	6200
Benzo(a)pyrene	SVOA	41000	JD	19000	2600	UD	2600	23000	D	220	8100	JD	6200
Benzo(b)fluoranthene	SVOA	25000	UD	25000	3400	UD	3400	36000	D	290	8100	UD	8100
Benzo(ghi)perylene	SVOA	22000	JD	15000	2100	UD	2100	13000	D	180	4900	UD	4900
Benzo(k)fluoranthene	SVOA	38000	UD	38000	5100	UD	5100	440	UD	440	12000	UD	12000
Bis(2-chloro-1-methylethyl)ether	SVOA	22000	UD	22000	3000	UD	3000	250	UD	250	7100	UD	7100
Bis(2-Chloroethoxy)methane	SVOA	22000	UD	22000	3000	UD	3000	250	UD	250	7100	UD	7100
Bis(2-chloroethyl) ether	SVOA	16000	UD	16000	2100	UD	2100	180	UD	180	5100	UD	5100
Bis(2-ethylhexyl) phthalate	SVOA	44000	UD	44000	5900	UD	5900	500	UD	500	14000	UD	14000
Butylbenzylphthalate	SVOA	41000	UD	41000	5500	UD	5500	470	UD	470	13000	UD	13000
Carbazole	SVOA	69000	JD	34000	4600	UD	4600	3200	JD	390	20000	JD	11000
Chrysene	SVOA	170000	JD	26000	3500	UD	3500	28000	D	300	36000	JD	8300
Di-n-butylphthalate	SVOA	28000	UD	28000	3700	UD	3700	320	UD	320	8900	UD	8900
Di-n-octylphthalate	SVOA	14000	UD	14000	1900	UD	1900	160	UD	160	4400	UD	4400
Dibenz[a,h]anthracene	SVOA	18000	UD	18000	2400	UD	2400	210	UD	210	5800	UD	5800
Dibenzofuran	SVOA	38000	JD	19000	2600	UD	2600	1800	JD	220	11000	JD	6200
Diethyl phthalate	SVOA	25000	UD	25000	3300	UD	3300	290	UD	290	8000	UD	8000
Dimethyl phthalate	SVOA	22000	UD	22000	3000	UD	3000	250	UD	250	7100	UD	7100
Fluoranthene	SVOA	34000	UD	34000	4600	UD	4600	45000	D	390	11000	UD	11000
Fluorene	SVOA	120000	JD	17000	2300	UD	2300	3100	JD	200	39000	JD	5500

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 10 of 18) .

CONSTITUENT	CLASS	4 Tar substance			5 Soil under 55-gl drum			6 Soil under amber oil			7 Soil with bunker oil		
		J1CY08			J1CXN7			J1CY07			J1CXX6		
		12/9/2010			12/9/2010			12/9/2010			12/9/2010		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	28000	UD	28000	3700	UD	3700	320	UD	320	8900	UD	8900
Hexachlorobutadiene	SVOA	9500	UD	9500	1300	UD	1300	110	UD	110	3100	UD	3100
Hexachlorocyclopentadiene	SVOA	48000	UD	48000	6400	UD	6400	550	UD	550	15000	UD	15000
Hexachloroethane	SVOA	20000	UD	20000	2700	UD	2700	230	UD	230	6600	UD	6600
Indeno(1,2,3-cd)pyrene	SVOA	21000	UD	21000	2800	UD	2800	12000	D	240	6800	UD	6800
Isophorone	SVOA	16000	UD	16000	2200	UD	2200	190	UD	190	5200	UD	5200
N-Nitroso-di-n-dipropylamine	SVOA	30000	UD	30000	4000	UD	4000	340	UD	340	9500	UD	9500
N-Nitrosodiphenylamine	SVOA	20000	UD	20000	5600	JD	2700	230	UD	230	6500	UD	6500
Naphthalene	SVOA	190000	JD	30000	4000	UD	4000	410	JD	340	150000	D	9500
Nitrobenzene	SVOA	21000	UD	21000	2800	UD	2800	240	UD	240	6800	UD	6800
Pentachlorophenol	SVOA	310000	UD	310000	42000	UD	42000	3600	UD	3600	100000	UD	100000
Phenanthrene	SVOA	570000	D	16000	2200	UD	2200	31000	D	190	170000	D	5200
Phenol	SVOA	17000	UD	17000	2300	UD	2300	200	UD	200	5500	UD	5500
Pyrene	SVOA	260000	JD	12000	3200	JD	1600	52000	D	130	64000	JD	3700
1,1,1-Trichloroethane	VOA	280	UD	280	0.50	U	0.50	0.52	U	0.52	220	UD	220
1,1,2,2-Tetrachloroethane	VOA	410	UD	410	0.59	U	0.59	0.61	U	0.61	330	UD	330
1,1,2-Trichloroethane	VOA	380	UD	380	0.85	U	0.85	0.89	U	0.89	300	UD	300
1,1-Dichloroethane	VOA	720	UD	720	0.20	U	0.20	0.21	UX	0.21	570	UD	570
1,1-Dichloroethene	VOA	720	UD	720	0.57	U	0.57	0.59	UX	0.59	570	UD	570
1,2-Dichloroethane	VOA	360	UD	360	0.67	U	0.67	0.70	U	0.70	280	UD	280
1,2-Dichloroethene(Total)	VOA	310	UD	310	0.38	U	0.38	0.39	U	0.39	250	UD	250
1,2-Dichloropropane	VOA	660	UD	660	0.53	U	0.53	0.55	UX	0.55	520	UD	520
2-Butanone	VOA	4200	UD	4200	1.9	J	1.8	1.8	U	1.8	3300	UD	3300
2-Hexanone	VOA	3100	UD	3100	4.7	U	4.7	4.9	U	4.9	2400	UD	2400
4-Methyl-2-Pentanone	VOA	3200	UD	3200	4.2	U	4.2	4.4	U	4.4	2500	UD	2500
Acetone	VOA	5700	UD	5700	10000	JD	8700	5.4	U	5.4	4500	UD	4500
Benzene	VOA	640	UD	640	8.9		0.45	0.47	UX	0.47	510	UD	510
Bromodichloromethane	VOA	560	UD	560	0.21	U	0.21	0.22	UX	0.22	450	UD	450
Bromoform	VOA	410	UD	410	0.22	U	0.22	0.23	U	0.23	330	UD	330
Bromomethane	VOA	670	UD	670	0.48	U	0.48	0.50	U	0.50	530	UD	530
Carbon disulfide	VOA	910	UD	910	0.40	U	0.40	0.42	U	0.42	720	UD	720
Carbon tetrachloride	VOA	240	UD	240	0.61	U	0.61	0.63	UX	0.63	190	UD	190
Chlorobenzene	VOA	430	UD	430	0.52	UX	0.52	0.54	UX	0.54	340	UD	340
Chloroethane	VOA	630	UD	630	0.86	U	0.86	0.90	U	0.90	490	UD	490
Chloroform	VOA	660	UD	660	0.28	U	0.28	0.29	UX	0.29	2000	JD	520
Chloromethane	VOA	710	UD	710	0.74	U	0.74	0.77	U	0.77	560	UD	560
cis-1,2-Dichloroethylene	VOA												
cis-1,3-Dichloropropene	VOA	380	UD	380	1.2	U	1.2	1.3	U	1.3	300	UD	300
Dibromochloromethane	VOA	470	UD	470	0.55	U	0.55	0.57	U	0.57	370	UD	370
Ethylbenzene	VOA	480	UD	480	75000	D	740	0.67	UX	0.67	2200	JD	380
Methylenechloride	VOA	1500	JDB	980	8.7	BX	0.72	7.1	BX	0.75	2300	JDB	780
Styrene	VOA	370	UD	370	0.61	U	0.61	0.63	U	0.63	290	UD	290
Tetrachloroethene	VOA	380	UD	380	65	X	0.57	2.9	JX	0.59	670	JD	300
Toluene	VOA	560	UD	560	11000	D	850	0.69	UX	0.69	1900	JD	440
trans-1,2-Dichloroethylene	VOA												
trans-1,3-Dichloropropene	VOA	590	UD	590	0.64	U	0.64	0.67	U	0.67	470	UD	470
Trichloroethene	VOA	330	UD	330	0.22	U	0.22	0.23	UX	0.23	260	UD	260
Vinyl chloride	VOA	380	UD	380	1.3	U	1.3	1.3	U	1.3	300	UD	300
Xylenes (total)	VOA	3600	D	500	490000	D	760	0.61	U	0.61	17000	D	390

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 11 of 18).

CONSTITUENT	CLASS	EX-A1			EX-A2			EX-A3			EX-A4		
		J1H221			J1H222			J1H223			J1H224		
		4/12/2011			4/12/2011			4/12/2011			4/12/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	29	U	29	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	23	U	23	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
2,4-Dimethylphenol	SVOA	65	U	65	67	U	67	68	U	68	67	U	67
2,4-Dinitrophenol	SVOA	330	U	330	340	U	340	340	U	340	340	U	340
2,4-Dinitrotoluene	SVOA	65	U	65	67	U	67	68	U	68	67	U	67
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	29	U	29	28	U	28
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	22	U	22	21	U	21
2-Methylnaphthalene	SVOA	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
2-Nitroaniline	SVOA	49	U	49	50	U	50	51	U	51	51	U	51
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	34	U	34	33	U	33
3,3'-Dichlorobenzidine	SVOA	89	U	89	91	U	91	92	U	92	91	U	91
3-Nitroaniline	SVOA	72	U	72	74	U	74	75	U	75	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	340	U	340	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	67	U	67	68	U	68	67	U	67
4-Chloroaniline	SVOA	81	U	81	83	U	83	84	U	84	83	U	83
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	22	U	22	21	U	21
4-Nitroaniline	SVOA	72	U	72	73	U	73	74	U	74	73	U	73
4-Nitrophenol	SVOA	96	U	96	98	U	98	99	U	99	98	U	98
Acenaphthene	SVOA	10	U	10	10	U	10	11	U	11	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	21	U	21	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	21	U	21	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	27	U	27	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	40	U	40	40	U	40	41	U	41	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	24	U	24	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	24	U	24	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	110	J	45	100	J	46	120	J	47	92	J	47
Butylbenzylphthalate	SVOA	43	U	43	43	U	43	44	U	44	44	U	44
Carbazole	SVOA	36	U	36	36	U	36	37	U	37	36	U	36
Chrysene	SVOA	27	U	27	27	U	27	28	U	28	27	U	27
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	30	U	30	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	15	U	15	15	U	15
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	20	U	20	20	U	20	21	U	21	20	U	20
Diethyl phthalate	SVOA	26	U	26	26	U	26	27	U	27	26	U	26
Dimethyl phthalate	SVOA	23	U	23	23	U	23	24	U	24	23	U	23
Fluoranthene	SVOA	36	U	36	36	U	36	37	U	37	36	U	36
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	18	U	18

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 12 of 18) .

CONSTITUENT	CLASS	EX-A1			EX-A2			EX-A3			EX-A4		
		J1H221			J1H222			J1H223			J1H224		
		4/12/2011			4/12/2011			4/12/2011			4/12/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	29	U	29	29	U	29	30	U	30	29	U	29
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	50	U	50	51	U	51	51	U	51
Hexachloroethane	SVOA	21	U	21	21	U	21	22	U	22	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	23	U	23	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	32	U	32	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	22	U	22	21	U	21
Naphthalene	SVOA	31	U	31	31	U	31	32	U	32	31	U	31
Nitrobenzene	SVOA	22	U	22	22	U	22	23	U	23	22	U	22
Pentachlorophenol	SVOA	330	U	330	330	U	330	340	U	340	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
Phenol	SVOA	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
1,1,1-Trichloroethane	VOA	0.50	U	0.50	0.47	U	0.47	0.51	U	0.51	0.48	U	0.48
1,1,2,2-Tetrachloroethane	VOA	0.59	U	0.59	0.55	U	0.55	0.60	U	0.60	0.56	U	0.56
1,1,2-Trichloroethane	VOA	0.85	U	0.85	0.80	U	0.80	0.86	U	0.86	0.81	U	0.81
1,1-Dichloroethane	VOA	0.20	U	0.20	0.19	U	0.19	0.21	U	0.21	0.19	U	0.19
1,1-Dichloroethene	VOA	0.57	U	0.57	0.54	U	0.54	0.58	U	0.58	0.54	U	0.54
1,2-Dichloroethane	VOA	0.68	U	0.68	0.64	U	0.64	0.69	U	0.69	0.64	U	0.64
1,2-Dichloroethene(Total)	VOA	0.38	U	0.38	0.35	U	0.35	0.38	U	0.38	0.36	U	0.36
1,2-Dichloropropane	VOA	0.53	U	0.53	0.50	U	0.50	0.54	U	0.54	0.50	U	0.50
2-Butanone	VOA	1.8	U	1.8	1.7	U	1.7	1.8	U	1.8	1.7	U	1.7
2-Hexanone	VOA	4.7	U	4.7	4.4	U	4.4	4.8	U	4.8	4.5	U	4.5
4-Methyl-2-Pentanone	VOA	4.2	U	4.2	4.0	U	4.0	4.3	U	4.3	4.0	U	4.0
Acetone	VOA	6.7	JB	5.2	10	JB	4.9	12	JB	5.3	37	B	4.9
Benzene	VOA	0.46	U	0.46	0.43	U	0.43	0.46	U	0.46	0.43	U	0.43
Bromodichloromethane	VOA	0.21	U	0.21	0.20	U	0.20	0.22	U	0.22	0.20	U	0.20
Bromoform	VOA	0.22	U	0.22	0.21	U	0.21	0.23	U	0.23	0.21	U	0.21
Bromomethane	VOA	0.48	U	0.48	0.45	U	0.45	0.49	U	0.49	0.46	U	0.46
Carbon disulfide	VOA	0.41	U	0.41	0.38	U	0.38	0.41	U	0.41	0.38	U	0.38
Carbon tetrachloride	VOA	0.61	U	0.61	0.57	U	0.57	0.62	U	0.62	0.58	U	0.58
Chlorobenzene	VOA	0.52	U	0.52	0.49	U	0.49	0.53	U	0.53	0.49	U	0.49
Chloroethane	VOA	0.86	U	0.86	0.81	U	0.81	0.87	U	0.87	0.82	U	0.82
Chloroform	VOA	0.28	U	0.28	0.26	U	0.26	0.28	U	0.28	0.27	U	0.27
Chloromethane	VOA	0.75	U	0.75	0.70	U	0.70	0.76	U	0.76	0.71	U	0.71
cis-1,2-Dichloroethylene	VOA												
cis-1,3-Dichloropropene	VOA	1.2	U	1.2	1.2	U	1.2	1.3	U	1.3	1.2	U	1.2
Dibromochloromethane	VOA	0.55	U	0.55	0.52	U	0.52	0.56	U	0.56	0.52	U	0.52
Ethylbenzene	VOA	0.65	U	0.65	0.61	U	0.61	0.66	U	0.66	0.61	U	0.61
Methylenechloride	VOA	1.7	JB	0.73	1.3	JB	0.68	1.5	JB	0.74	1.4	JB	0.69
Styrene	VOA	0.61	U	0.61	0.57	U	0.57	0.62	U	0.62	0.58	U	0.58
Tetrachloroethene	VOA	0.57	U	0.57	0.54	U	0.54	0.58	U	0.58	0.54	U	0.54
Toluene	VOA	0.67	U	0.67	0.63	U	0.63	0.68	U	0.68	0.63	U	0.63
trans-1,2-Dichloroethylene	VOA												
trans-1,3-Dichloropropene	VOA	0.65	U	0.65	0.61	U	0.61	0.66	U	0.66	0.61	U	0.61
Trichloroethene	VOA	0.22	U	0.22	0.21	U	0.21	0.23	U	0.23	0.21	U	0.21
Vinyl chloride	VOA	1.3	U	1.3	1.2	U	1.2	1.3	U	1.3	1.2	U	1.2
Xylenes (total)	VOA	0.59	U	0.59	0.55	U	0.55	0.60	U	0.60	0.56	U	0.56

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 13 of 18) .

CONSTITUENT	CLASS	EX-A5			1 Soil near B-25			2 Soil with bunker oil			3 Soil with diesel oil		
		J1H225			J1JW43			J1JW44			J1JW45		
		4/12/2011			6/27/2011			6/27/2011			6/27/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	27	U	27	2700	UD	2700
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	21	U	21	2100	UD	2100
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	1200	UD	1200
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	13	U	13	1300	UD	1300
2,4,5-Trichlorophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	970	UD	970
2,4,6-Trichlorophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	970	UD	970
2,4-Dichlorophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	970	UD	970
2,4-Dimethylphenol	SVOA	67	U	67	66	U	66	64	U	64	6400	UD	6400
2,4-Dinitrophenol	SVOA	340	U	340	330	U	330	320	U	320	32000	UD	32000
2,4-Dinitrotoluene	SVOA	67	U	67	66	U	66	64	U	64	6400	UD	6400
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	27	U	27	2700	UD	2700
2-Chloronaphthalene	SVOA	10	U	10	10	U	10	9.7	U	9.7	970	UD	970
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	2000	UD	2000
2-Methylnaphthalene	SVOA	43	J	19	19	U	19	18	U	18	1800	UD	1800
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	1300	UD	1300
2-Nitroaniline	SVOA	51	U	51	50	U	50	48	U	48	4800	UD	4800
2-Nitrophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	970	UD	970
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	32	U	32	3200	UD	3200
3,3'-Dichlorobenzidine	SVOA	91	U	91	90	U	90	87	U	87	8700	UD	8700
3-Nitroaniline	SVOA	74	U	74	73	U	73	70	U	70	7100	UD	7100
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	320	U	320	32000	UD	32000
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	1800	UD	1800
4-Chloro-3-methylphenol	SVOA	67	U	67	66	U	66	64	U	64	6400	UD	6400
4-Chloroaniline	SVOA	83	U	83	82	U	82	79	U	79	7900	UD	7900
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	2000	UD	2000
4-Nitroaniline	SVOA	73	U	73	72	U	72	70	U	70	7000	UD	7000
4-Nitrophenol	SVOA	98	U	98	97	U	97	94	U	94	9400	UD	9400
Acenaphthene	SVOA	10	U	10	10	U	10	9.9	U	9.9	1000	UD	1000
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	1600	UD	1600
Anthracene	SVOA	110	J	17	21	J	17	16	U	16	1800	JD	1600
Benzo(a)anthracene	SVOA	40	J	20	140	J	20	19	U	19	5200	JD	1900
Benzo(a)pyrene	SVOA	140	J	20	160	J	20	19	U	19	2700	JD	1900
Benzo(b)fluoranthene	SVOA	190	JX	27	270	JX	26	25	U	25	2500	UD	2500
Benzo(ghi)perylene	SVOA	16	U	16	120	J	16	15	U	15	2400	JD	1600
Benzo(k)fluoranthene	SVOA	41	UX	41	40	UX	40	39	U	39	3900	UD	3900
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	22	U	22	2200	UD	2200
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	22	U	22	2200	UD	2200
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	16	U	16	1600	UD	1600
Bis(2-ethylhexyl) phthalate	SVOA	95	J	47	94	J	46	72	J	44	8600	JD	4500
Butylbenzylphthalate	SVOA	44	U	44	43	U	43	41	U	41	4200	UD	4200
Carbazole	SVOA	36	U	36	36	U	36	35	U	35	3500	UD	3500
Chrysene	SVOA	51	J	27	170	J	27	26	U	26	7100	JD	2600
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	28	U	28	2800	UD	2800
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	14	U	14	1400	UD	1400
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	18	U	18	1800	UD	1800
Dibenzofuran	SVOA	20	U	20	20	U	20	19	U	19	1900	UD	1900
Diethyl phthalate	SVOA	26	U	26	26	U	26	25	U	25	2500	UD	2500
Dimethyl phthalate	SVOA	23	U	23	23	U	23	22	U	22	2200	UD	2200
Fluoranthene	SVOA	120	J	36	210	J	36	35	U	35	3500	UD	3500
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	1700	UD	1700

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 14 of 18).

CONSTITUENT	CLASS	EX-A5			1 Soil near B-25			2 Soil with bunker oil			3 Soil with diesel oil		
		J1H225			J1JW43			J1JW44			J1JW45		
		4/12/2011			6/27/2011			6/27/2011			6/27/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	29	U	29	29	U	29	28	U	28	2800	UD	2800
Hexachlorobutadiene	SVOA	10	U	10	10	U	10	9.7	U	9.7	970	UD	970
Hexachlorocyclopentadiene	SVOA	51	U	51	50	U	50	48	U	48	4800	UD	4800
Hexachloroethane	SVOA	22	U	22	21	U	21	21	U	21	2100	UD	2100
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	93	J	22	21	U	21	2100	UD	2100
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	1600	UD	1600
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	30	U	30	3000	UD	3000
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	20	U	20	6600	JD	2000
Naphthalene	SVOA	31	U	31	31	U	31	30	U	30	3000	UD	3000
Nitrobenzene	SVOA	22	U	22	22	U	22	21	U	21	2100	UD	2100
Pentachlorophenol	SVOA	330	U	330	330	U	330	320	U	320	32000	UD	32000
Phenanthrene	SVOA	32	J	17	93	J	17	16	U	16	19000	JD	1600
Phenol	SVOA	18	U	18	18	U	18	17	U	17	1700	UD	1700
Pyrene	SVOA	70	J	12	230	J	12	21	J	12	16000	JD	1200
1,1,1-Trichloroethane	VOA	0.48	U	0.48	0.53	U	0.53	0.48	U	0.48	0.47	U	0.47
1,1,2,2-Tetrachloroethane	VOA	0.56	U	0.56	0.62	U	0.62	0.56	U	0.56	0.55	U	0.55
1,1,2-Trichloroethane	VOA	0.81	U	0.81	0.89	U	0.89	0.81	U	0.81	0.80	U	0.80
1,1-Dichloroethane	VOA	0.19	U	0.19	0.21	U	0.21	0.19	U	0.19	0.19	U	0.19
1,1-Dichloroethene	VOA	0.54	U	0.54	0.6	U	0.6	0.54	U	0.54	0.54	U	0.54
1,2-Dichloroethane	VOA	0.65	U	0.65	0.71	U	0.71	0.64	U	0.64	0.64	U	0.64
1,2-Dichloroethene(Total)	VOA	0.36	UX	0.36	0.4	U	0.4	0.36	U	0.36	0.35	U	0.35
1,2-Dichloropropane	VOA	0.51	UX	0.51	0.56	U	0.56	0.51	U	0.51	0.50	U	0.50
2-Butanone	VOA	1.7	U	1.7	1.9	U	1.9	1.7	U	1.7	5.2	J	1.7
2-Hexanone	VOA	4.5	U	4.5	5.0	U	5.0	4.5	U	4.5	4.4	U	4.4
4-Methyl-2-Pentanone	VOA	4.0	U	4.0	4.4	U	4.4	4.0	U	4.0	4.0	U	4.0
Acetone	VOA	7.5	JB	5.0	5.5	U	5.5	4.9	U	4.9	29		4.9
Benzene	VOA	0.43	U	0.43	0.48	U	0.48	0.43	U	0.43	0.43	U	0.43
Bromodichloromethane	VOA	0.20	U	0.20	0.22	U	0.22	0.20	U	0.20	0.20	U	0.20
Bromoform	VOA	0.21	U	0.21	0.23	U	0.23	0.21	U	0.21	0.21	U	0.21
Bromomethane	VOA	0.46	U	0.46	0.51	U	0.51	0.46	U	0.46	0.45	U	0.45
Carbon disulfide	VOA	0.39	U	0.39	0.43	U	0.43	0.39	U	0.39	0.38	U	0.38
Carbon tetrachloride	VOA	0.58	U	0.58	0.64	U	0.64	0.58	U	0.58	0.57	U	0.57
Chlorobenzene	VOA	0.50	UX	0.50	0.55	U	0.55	0.5	U	0.5	0.49	U	0.49
Chloroethane	VOA	0.82	U	0.82	0.9	U	0.9	0.82	U	0.82	0.81	U	0.81
Chloroform	VOA	0.27	U	0.27	0.29	U	0.29	0.27	U	0.27	0.26	U	0.26
Chloromethane	VOA	0.71	U	0.71	0.78	U	0.78	0.71	U	0.71	0.70	U	0.70
cis-1,2-Dichloroethylene	VOA												
cis-1,3-Dichloropropene	VOA	1.2	U	1.2	1.3	U	1.3	1.2	U	1.2	1.2	U	1.2
Dibromochloromethane	VOA	0.53	U	0.53	0.58	U	0.58	0.52	U	0.52	0.52	U	0.52
Ethylbenzene	VOA	0.62	UX	0.62	0.68	U	0.68	0.62	U	0.62	1.5	J	0.61
Methylenechloride	VOA	1.2	JB	0.69	0.76	U	0.76	0.69	U	0.69	5.1		0.68
Styrene	VOA	0.58	U	0.58	0.64	U	0.64	0.58	U	0.58	0.88	J	0.57
Tetrachloroethene	VOA	0.54	U	0.54	0.60	U	0.60	0.54	U	0.54	0.54	U	0.54
Toluene	VOA	0.64	UX	0.64	1.2	J	0.70	0.63	U	0.63	5.3		0.63
trans-1,2-Dichloroethylene	VOA												
trans-1,3-Dichloropropene	VOA	0.62	U	0.62	0.68	U	0.68	0.62	U	0.62	0.61	U	0.61
Trichloroethene	VOA	0.21	U	0.21	0.23	U	0.23	0.21	U	0.21	0.21	U	0.21
Vinyl chloride	VOA	1.2	U	1.2	1.4	U	1.4	1.2	U	1.2	1.2	U	1.2
Xylenes (total)	VOA	0.56	U	0.56	3.2	J	0.62	0.56	U	0.56	6.9		0.55

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 15 of 18) .

CONSTITUENT	CLASS	1 Soil with diesel oil			Anomaly Staging Area-1			Anomaly Staging Area-2			SPA-3		
		J1LJF0			J1P286			J1P287			J1P288		
		11/28/2011			5/14/12 10:05			5/14/12 10:10			5/14/12 10:15		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	29	U	29	30	U	30	130	UD	130
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	24	U	24	110	UD	110
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	13	U	13	58	UD	58
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	15	U	15	66	UD	66
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	11	U	11	48	UD	48
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	11	U	11	48	UD	48
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	11	U	11	48	UD	48
2,4-Dimethylphenol	SVOA	65	U	65	67	U	67	71	U	71	320	UD	320
2,4-Dinitrophenol	SVOA	330	U	330	340	U	340	360	U	360	1600	UD	1600
2,4-Dinitrotoluene	SVOA	65	U	65	67	U	67	71	U	71	320	UD	320
2,6-Dinitrotoluene	SVOA	28	U	28	29	U	29	30	U	30	130	UD	130
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	11	U	11	48	UD	48
2-Chlorophenol	SVOA	21	U	21	21	U	21	23	U	23	100	UD	100
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	20	U	20	150	JD	92
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	14	U	14	63	UD	63
2-Nitroaniline	SVOA	49	U	49	51	U	51	54	U	54	240	UD	240
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	11	U	11	48	UD	48
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	34	U	34	35	U	35	160	UD	160
3,3'-Dichlorobenzidine	SVOA	89	U	89	92	U	92	97	U	97	430	UD	430
3-Nitroaniline	SVOA	72	U	72	74	U	74	78	U	78	350	UD	350
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	340	U	340	350	U	350	1600	UD	1600
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	20	U	20	92	UD	92
4-Chloro-3-methylphenol	SVOA	65	U	65	67	U	67	71	U	71	320	UD	320
4-Chloroaniline	SVOA	81	U	81	84	U	84	88	U	88	390	UD	390
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	23	U	23	100	UD	100
4-Nitroaniline	SVOA	72	U	72	74	U	74	78	U	78	350	UD	350
4-Nitrophenol	SVOA	96	U	96	99	U	99	100	U	100	470	UD	470
Acenaphthene	SVOA	10	U	10	11	U	11	11	U	11	1200	JD	50
Acenaphthylene	SVOA	17	U	17	17	U	17	18	U	18	82	UD	82
Anthracene	SVOA	17	U	17	17	U	17	18	U	18	1300	JD	82
Benzo(a)anthracene	SVOA	20	U	20	22	J	20	44	J	21	3200	D	96
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	47	J	21	2800	D	96
Benzo(b)fluoranthene	SVOA	26	U	26	32	JX	27	81	JX	28	4600	DX	130
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	34	J	17	1400	JD	77
Benzo(k)fluoranthene	SVOA	40	U	40	41	UX	41	43	UX	43	190	UDX	190
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	25	U	25	110	UD	110
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	25	U	25	110	UD	110
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	18	U	18	80	UD	80
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	47	U	47	49	U	49	740	JD	220
Butylbenzylphthalate	SVOA	43	U	43	44	U	44	46	U	46	210	UD	210
Carbazole	SVOA	36	U	36	37	U	37	39	U	39	780	JD	170
Chrysene	SVOA	27	U	27	28	U	28	57	J	29	3900	D	130
Di-n-butylphthalate	SVOA	29	U	29	30	U	30	31	U	31	140	UD	140
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	15	U	15	69	UD	69
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	20	U	20	92	UD	92
Dibenzofuran	SVOA	20	U	20	20	U	20	21	U	21	440	JD	96
Diethyl phthalate	SVOA	26	U	26	27	U	27	28	U	28	130	UD	130
Dimethyl phthalate	SVOA	250	JB	23	23	U	23	25	U	25	110	UD	110
Fluoranthene	SVOA	36	U	36	37	U	37	65	J	39	7800	D	170
Fluorene	SVOA	18	U	18	18	U	18	19	U	19	800	JD	87

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 16 of 18).

CONSTITUENT	CLASS	1 Soil with diesel oil			Anomaly Staging Area-1			Anomaly Staging Area-2			SPA-3		
		J1LJF0			J1P286			J1P287			J1P288		
		11/28/2011			5/14/12 10:05			5/14/12 10:10			5/14/12 10:15		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	29	U	29	30	U	30	31	U	31	140	UD	140
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	11	U	11	48	UD	48
Hexachlorocyclopentadiene	SVOA	49	U	49	51	U	51	54	U	54	240	UD	240
Hexachloroethane	SVOA	21	U	21	22	U	22	23	U	23	100	UD	100
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	28	J	24	1300	JD	110
Isophorone	SVOA	17	U	17	17	U	17	18	U	18	82	UD	82
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	32	U	32	33	U	33	150	UD	150
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	23	U	23	100	UD	100
Naphthalene	SVOA	31	U	31	32	U	32	33	U	33	210	JD	150
Nitrobenzene	SVOA	22	U	22	22	U	22	24	U	24	110	UD	110
Pentachlorophenol	SVOA	330	U	330	340	U	340	350	U	350	1600	UD	1600
Phenanthrene	SVOA	17	U	17	17	U	17	36	J	18	6900	D	82
Phenol	SVOA	18	U	18	18	U	18	19	U	19	87	UD	87
Pyrene	SVOA	12	U	12	27	J	12	67	J	13	7100	D	58
1,1,1-Trichloroethane	VOA	0.47	U	0.47	0.53	U	0.53	0.56	U	0.56	0.62	U	0.62
1,1,2,2-Tetrachloroethane	VOA	0.55	U	0.55	0.62	U	0.62	0.66	U	0.66	0.73	U	0.73
1,1,2-Trichloroethane	VOA	0.79	U	0.79	0.90	U	0.90	0.95	U	0.95	1.0	U	1.0
1,1-Dichloroethane	VOA	0.19	U	0.19	0.21	U	0.21	0.23	U	0.23	0.25	U	0.25
1,1-Dichloroethene	VOA	0.53	U	0.53	0.60	U	0.60	0.63	U	0.63	0.70	U	0.70
1,2-Dichloroethane	VOA	0.63	U	0.63	0.71	U	0.71	0.75	U	0.75	0.83	U	0.83
1,2-Dichloroethene(Total)	VOA	0.35	U	0.35	0.40	U	0.40	0.42	U	0.42	0.46	U	0.46
1,2-Dichloropropane	VOA	0.50	U	0.50	0.56	U	0.56	0.59	U	0.59	0.66	U	0.66
2-Butanone	VOA	1.6	U	1.6	1.9	UX	1.9	2.0	U	2.0	2.2	U	2.2
2-Hexanone	VOA	4.4	U	4.4	5.0	U	5.0	5.3	U	5.3	5.8	U	5.8
4-Methyl-2-Pentanone	VOA	3.9	U	3.9	4.4	U	4.4	4.7	U	4.7	5.2	U	5.2
Acetone	VOA	4.8	U	4.8	5.5	U	5.5	5.9	JB	5.8	9.9	JB	6.4
Benzene	VOA	0.42	U	0.42	0.48	U	0.48	0.51	U	0.51	0.56	U	0.56
Bromodichloromethane	VOA	0.20	U	0.20	0.22	U	0.22	0.24	U	0.24	0.26	U	0.26
Bromoform	VOA	0.21	U	0.21	0.23	U	0.23	0.25	U	0.25	0.27	U	0.27
Bromomethane	VOA	0.45	U	0.45	0.51	U	0.51	0.54	U	0.54	0.60	U	0.60
Carbon disulfide	VOA	0.38	U	0.38	0.43	U	0.43	0.45	U	0.45	0.50	U	0.50
Carbon tetrachloride	VOA	0.57	U	0.57	0.64	U	0.64	0.68	U	0.68	0.75	U	0.75
Chlorobenzene	VOA	0.49	U	0.49	0.55	U	0.55	0.58	U	0.58	0.64	U	0.64
Chloroethane	VOA	0.80	U	0.80	0.91	U	0.91	0.96	U	0.96	1.1	U	1.1
Chloroform	VOA	0.26	U	0.26	0.30	U	0.30	0.31	U	0.31	0.35	U	0.35
Chloromethane	VOA	0.69	U	0.69	0.78	UX	0.78	0.83	UX	0.83	0.92	UX	0.92
cis-1,2-Dichloroethylene	VOA												
cis-1,3-Dichloropropene	VOA	1.2	U	1.2	1.3	U	1.3	1.4	U	1.4	1.5	U	1.5
Dibromochloromethane	VOA	0.51	U	0.51	0.58	U	0.58	0.61	U	0.61	0.68	U	0.68
Ethylbenzene	VOA	0.60	U	0.60	0.68	U	0.68	0.72	U	0.72	0.8	U	0.8
Methylenechloride	VOA	0.68	U	0.68	1.6	U	1.6	1.7	U	1.7	1.9	U	1.9
Styrene	VOA	0.57	U	0.57	0.64	U	0.64	0.68	U	0.68	0.75	U	0.75
Tetrachloroethene	VOA	0.53	U	0.53	0.6	U	0.6	0.63	U	0.63	0.70	U	0.70
Toluene	VOA	0.62	U	0.62	0.7	U	0.7	0.74	U	0.74	0.82	U	0.82
trans-1,2-Dichloroethylene	VOA												
trans-1,3-Dichloropropene	VOA	0.60	U	0.60	0.68	U	0.68	0.72	U	0.72	0.80	U	0.80
Trichloroethene	VOA	0.21	U	0.21	0.23	U	0.23	0.25	U	0.25	0.27	U	0.27
Vinyl chloride	VOA	1.2	U	1.2	1.4	U	1.4	1.4	U	1.4	1.6	U	1.6
Xylenes (total)	VOA	0.55	U	0.55	0.62	U	0.62	0.66	U	0.66	0.73	U	0.73

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 17of 18) .

CONSTITUENT	CLASS	SPA-4			SPA-5		
		J1P289			J1P290		
		5/14/12 9:52			5/14/12 10:20		
		ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	110	UD	110
1,2-Dichlorobenzene	SVOA	22	U	22	84	UD	84
1,3-Dichlorobenzene	SVOA	12	U	12	46	UD	46
1,4-Dichlorobenzene	SVOA	13	U	13	52	UD	52
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	38	UD	38
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	38	UD	38
2,4-Dichlorophenol	SVOA	9.9	U	9.9	38	UD	38
2,4-Dimethylphenol	SVOA	65	U	65	250	UD	250
2,4-Dinitrophenol	SVOA	330	U	330	1300	UD	1300
2,4-Dinitrotoluene	SVOA	65	U	65	250	UD	250
2,6-Dinitrotoluene	SVOA	28	U	28	110	UD	110
2-Chloronaphthalene	SVOA	9.9	U	9.9	38	UD	38
2-Chlorophenol	SVOA	21	U	21	80	UD	80
2-Methylnaphthalene	SVOA	19	U	19	73	UD	73
2-Methylphenol (cresol, o-)	SVOA	13	U	13	50	UD	50
2-Nitroaniline	SVOA	49	U	49	190	UD	190
2-Nitrophenol	SVOA	9.9	U	9.9	38	UD	38
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	130	UD	130
3,3'-Dichlorobenzidine	SVOA	89	U	89	340	UD	340
3-Nitroaniline	SVOA	72	U	72	280	UD	280
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	1300	UD	1300
4-Bromophenylphenyl ether	SVOA	19	U	19	73	UD	73
4-Chloro-3-methylphenol	SVOA	65	U	65	250	UD	250
4-Chloroaniline	SVOA	81	U	81	310	UD	310
4-Chlorophenylphenyl ether	SVOA	21	U	21	80	UD	80
4-Nitroaniline	SVOA	72	U	72	280	UD	280
4-Nitrophenol	SVOA	96	U	96	370	UD	370
Acenaphthene	SVOA	160	J	10	39	UD	39
Acenaphthylene	SVOA	17	U	17	65	UD	65
Anthracene	SVOA	230	J	17	65	UD	65
Benzo(a)anthracene	SVOA	710		20	76	JD	76
Benzo(a)pyrene	SVOA	670		20	76	UD	76
Benzo(b)fluoranthene	SVOA	1100	X	26	100	UD	100
Benzo(ghi)perylene	SVOA	370		16	61	UD	61
Benzo(k)fluoranthene	SVOA	40	UX	40	150	UD	150
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	88	UD	88
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	88	UD	88
Bis(2-chloroethyl) ether	SVOA	16	U	16	63	UD	63
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	180	UD	180
Butylbenzylphthalate	SVOA	43	U	43	160	UD	160
Carbazole	SVOA	130	J	36	140	UD	140
Chrysene	SVOA	920		27	100	UD	100
Di-n-butylphthalate	SVOA	29	U	29	110	UD	110
Di-n-octylphthalate	SVOA	14	U	14	55	UD	55
Dibenz[a,h]anthracene	SVOA	19	U	19	73	UD	73
Dibenzofuran	SVOA	51	J	20	76	UD	76
Diethyl phthalate	SVOA	26	U	26	99	UD	99
Dimethyl phthalate	SVOA	23	U	23	88	UD	88
Fluoranthene	SVOA	1600		36	140	UD	140
Fluorene	SVOA	110	J	18	69	UD	69

Table B-5: 100-N-6, 100-N-16, 100-N-98 and 128-N-1 Waste Sites In-Process Sample Results - Organics (Page 18 of 18) .

CONSTITUENT	CLASS	SPA-4			SPA-5		
		J1P289			J1P290		
		5/14/12 9:52			5/14/12 10:20		
		ug/kg	Q	PQL	ug/kg	Q	PQL
Hexachlorobenzene	SVOA	29	U	29	110	UD	110
Hexachlorobutadiene	SVOA	9.9	U	9.9	38	UD	38
Hexachlorocyclopentadiene	SVOA	49	U	49	190	UD	190
Hexachloroethane	SVOA	21	U	21	81	UD	81
Indeno(1,2,3-cd)pyrene	SVOA	340		22	84	UD	84
Isophorone	SVOA	17	U	17	65	UD	65
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	120	UD	120
N-Nitrosodiphenylamine	SVOA	21	U	21	80	UD	80
Naphthalene	SVOA	31	U	31	120	UD	120
Nitrobenzene	SVOA	22	U	22	84	UD	84
Pentachlorophenol	SVOA	330	U	330	1300	UD	1300
Phenanthrene	SVOA	1100		17	65	UD	65
Phenol	SVOA	18	U	18	69	UD	69
Pyrene	SVOA	1600		12	140	JD	46
1,1,1-Trichloroethane	VOA	0.51	U	0.51	0.51	U	0.51
1,1,2,2-Tetrachloroethane	VOA	0.60	U	0.60	0.60	U	0.60
1,1,2-Trichloroethane	VOA	0.86	U	0.86	0.87	U	0.87
1,1-Dichloroethane	VOA	0.21	U	0.21	0.21	U	0.21
1,1-Dichloroethene	VOA	0.58	U	0.58	0.58	U	0.58
1,2-Dichloroethane	VOA	0.69	U	0.69	0.69	U	0.69
1,2-Dichloroethene(Total)	VOA	0.38	U	0.38	0.39	U	0.39
1,2-Dichloropropane	VOA	0.54	U	0.54	0.54	U	0.54
2-Butanone	VOA	1.8	U	1.8	1.8	U	1.8
2-Hexanone	VOA	4.8	U	4.8	4.8	U	4.8
4-Methyl-2-Pentanone	VOA	4.3	U	4.3	4.3	U	4.3
Acetone	VOA	7.6	JB	5.3	8.5	JB	5.3
Benzene	VOA	0.46	U	0.46	0.46	U	0.46
Bromodichloromethane	VOA	0.22	U	0.22	0.22	U	0.22
Bromoform	VOA	0.23	U	0.23	0.23	U	0.23
Bromomethane	VOA	0.49	U	0.49	0.49	U	0.49
Carbon disulfide	VOA	0.41	U	0.41	0.41	U	0.41
Carbon tetrachloride	VOA	0.62	U	0.62	0.62	U	0.62
Chlorobenzene	VOA	0.53	U	0.53	0.53	U	0.53
Chloroethane	VOA	0.87	U	0.87	0.88	U	0.88
Chloroform	VOA	0.28	U	0.28	0.29	U	0.29
Chloromethane	VOA	0.75	UX	0.75	0.76	UX	0.76
cis-1,2-Dichloroethylene	VOA						
cis-1,3-Dichloropropene	VOA	1.3	U	1.3	1.3	U	1.3
Dibromochloromethane	VOA	0.56	U	0.56	0.56	U	0.56
Ethylbenzene	VOA	0.66	U	0.66	0.66	U	0.66
Methylenechloride	VOA	1.6	U	1.6	1.6	U	1.6
Styrene	VOA	0.62	U	0.62	0.62	U	0.62
Tetrachloroethene	VOA	0.58	U	0.58	0.58	U	0.58
Toluene	VOA	0.68	U	0.68	0.68	U	0.68
trans-1,2-Dichloroethylene	VOA						
trans-1,3-Dichloropropene	VOA	0.66	U	0.66	0.66	U	0.66
Trichloroethene	VOA	0.23	U	0.23	0.23	U	0.23
Vinyl chloride	VOA	1.3	U	1.3	1.3	U	1.3
Xylenes (total)	VOA	0.60	U	0.60	0.60	U	0.60

APPENDIX C

PHOTOGRAPHS

Figure C-1. Photograph of the Stockpiled Materials.

Figure C-2. Photograph of Miscellaneous Items Found and Disposed 1.

Figure C-3. Photograph of Miscellaneous Items Found and Disposed 2.

Figure C-4. Photograph of Miscellaneous Items Found and Disposed 3.

Figure C-5. Photograph of Miscellaneous Items Found and Disposed 4.

Figure C-6. Photograph of Miscellaneous Items Found and Disposed 5.

Figure C-7. Photograph of Miscellaneous Items Found and Disposed 6.

Figure C-8. Photograph of Miscellaneous Items Found and Disposed 7.

Figure C-9. Photograph of Miscellaneous Items Found and Disposed 8.

Figure C-10. Photograph of Miscellaneous Items Found and Disposed 9.

Figure C-11. Post-Remediation Photograph of 100-N-6, 100-N-16, and 128-N-1 Excavation, Looking North.

Figure C-12. Post-Remediation Photograph of 100-N-98, Excavation, Looking North.

Figure C-13. Post-Remediation Photograph of the Staging Pile Area, Looking West.

APPENDIX D

CALCULATION BRIEFS

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 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 Calculation," Washington Closure Hanford, Richland, Washington. The following calculations are provided in this appendix.

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Cleanup Verification, 95% UCL Calculation, 0100N-CA-V0163, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Direct Contact Hazard Quotient and Carcinogenic Risk Calculation, 0100N-CA-V0166, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater, 0100N-CA-V0167, 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-N Field Remediation **Job No. 14655**

Area: 100-N

Discipline: Environmental *Calculation No: 0100N-CA-V0163

Subject: 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites 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 = 20 Attm. 1 = 20 Total = 41	J. D. Skoglie	N. K. Schiffern	I. B. Berezovskiy	D. F. Obenauer	2/26/13

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie		**Date** 01/28/13	**Calc. No.** 0100N-CA-V0163	**Rev. No.**	0
Project 100-N Field Remediation		**Job No.** 14655	**Checked** N. K. Schiffern	**Date**	01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations				**Sheet No.**	1 of 20

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:
Sheets 1 to 4 - Calculation Sheet Summary
Sheets 5 to 13 - Calculation Sheet Verification Data - Excavation and Staging Pile Area
Sheets 14 to 18 - Ecology Software (MTCAStat) Results
Sheet 19 to 20 - Calculation Sheet Duplicate Analysis
Attachment 1 - 100-N-6, 100-N-16, 100-N-98, and 128-N-1, Verification Sampling Results (20 sheets)

Given/References:
1) Sample Results (Attachment 1).
2) DOE-RL, 2006a, 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites, DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
3) DOE-RL, 2006b, Remedial Design Report/Remedial Action Work Plan for the 100-N Area, DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) Ecology, 1992, Statistical Guidance for Ecology Site Managers, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
5) 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.
6) Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
7) Ecology, 2012, "128-N-1 Additional Remediation Proposal", CCN 168091, E-Mail Message October 11, 2012 to Joshua E. Jakubek, Washington Closure Hanford from Wanda Elliott, Washington State Department of Ecology, Richland Operations Office, Richland, Washington.
8) 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.
9) 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 2006b). 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites. 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 2006b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:
The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites underwent statistical sampling at two decision units; excavation area and staging pile area. In addition, four focused samples were collected from the excavation.

Analytical results for all sampling locations are summarized in the tables provided on sheet 4. Sample locations EXC-9, EXC-13, SPA-11, and FS-4 exceeded direct exposure cleanup levels for multiple constituents. These four areas were remediated and re-sampled as discussed in the 128-N-1 Additional Remediation Proposal agreement (Ecology 2012). Further information of the sample data quality is presented in the data quality assessment section of the associated RSVP.

For polycyclic aromatic hydrocarbons (PAHs), two separate analyses were performed that provided data; 8310 (PAH specific) and 8270 (semivolatile organics). Only data from the 8310 PAH specific analysis are evaluated for cleanup and included in the results summary table(s). However, PAH data from both analyses is evaluated for RPD calculation.

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie		**Date** 01/28/13	**Calc. No.** 0100N-CA-V0163	**Rev. No.**	0
Project 100-N Field Remediation		**Job No.** 14655	**Checked** N. K. Schiffern	**Date**	01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations				**Sheet No.**	2 of 20

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.

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 2006b) 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 2006a) 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)

QUALIFIER LIST

B = estimated result. Result is less than the RL, but greater than MDL.
J = estimate
M = sample duplicate precision not met
N = recovery exceeds upper or lower control limits.
P = Aroclor target analyte with greater than 40% difference between column analysis.
U = undetected
X = more than 40% difference between columns, lower result reported (organics).
X = serial dilution in the analytical batch indicates that physical and chemical interferences are present (metals).

ACRONYM LIST

-- = not applicable
DE = direct exposure
EXC = excavation
FS = focused sample
GW = groundwater
MTCA = *Model Toxics Control Act*
PAH = polycyclic aromatic hydrocarbons
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
RSVP = remaining sites verification package
SAP = sampling and analysis plan
SPA = staging pile area
TDL = target detection limit
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = Washington Administrative Code

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie **Date** 01/28/13 **Calc. No.** 0100N-CA-V0163 **Rev. No.** 0
Project 100-N Field Remediation **Job No.** 14655 **Checked** N. K. Schiffern **Date** 01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 4 of 20

Summary (continued)

Results:

The results presented in the tables that follow include the summary of the 95% UCL calculations and maximum results for the excavation, staging pile area, focused samples, 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 - Excavation, Staging Pile Area, and Focused Samples

Analyte	EXC		SPA		Focused	Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	Maximum Result	
Arsenic	3.9	–	3.07	–	4.1	mg/kg
Barium	86.9	–	69.6	–	49.4	mg/kg
Beryllium	0.49	–	0.289	–	0.55	mg/kg
Boron	1.7	–	–	3.18	1.5	mg/kg
Cadmium	0.14	–	–	0.176	0.17	mg/kg
Chromium	13.0	–	22.1	–	11.4	mg/kg
Cobalt	8.9	–	8.73	–	9.3	mg/kg
Copper	65.2	–	22.0	–	21.8	mg/kg
Lead	43.8	–	7.83	–	8.0	mg/kg
Manganese	311	–	332	–	298	mg/kg
Mercury	–	0.0076	–	–	0.021	mg/kg
Molybdenum	–	0.44	–	0.736	–	mg/kg
Nickel	15.5	–	20.7	–	11.7	mg/kg
Selenium	–	–	–	0.799	–	mg/kg
Silver	0.24	–	–	–	0.60	mg/kg
Vanadium	56.5	–	62.1	–	59.0	mg/kg
Zinc	49.1	–	51.1	–	60.5	mg/kg
1,1-Dichloroethene	–	–	–	–	0.00075	mg/kg
2-methylnaphthalene	–	0.031	–	–	–	mg/kg
Acenaphthene	–	–	0.127	–	–	mg/kg
Acenaphthylene	–	–	–	0.00643	–	mg/kg
Acetone	0.0086	–	–	0.00456	0.0073	mg/kg
Anthracene	–	0.015	–	0.00321	–	mg/kg
Aroclor-1254	–	0.016	–	0.0341	0.0077	mg/kg
Aroclor-1260	–	0.052	–	0.0726	0.044	mg/kg
Benzo(a)anthracene	–	0.054	0.0111	–	–	mg/kg
Benzo(a)pyrene	–	0.093	0.0109	–	0.011	mg/kg
Benzo(b)fluoranthene	–	0.094	0.00796	–	0.0096	mg/kg
Benzo(ghi)perylene	–	0.075	0.0119	–	–	mg/kg
Benzo(k)fluoranthene	–	0.039	–	0.00932	–	mg/kg
Bis(2-ethylhexyl)phthalate	–	–	–	0.132	0.087	mg/kg
Carbazole	–	0.21	–	–	0.039	mg/kg
Chrysene	–	0.084	0.0288	–	0.0083	mg/kg
Di-n-octylphthalate	–	0.076	–	–	–	mg/kg
Dibenz(a,h)anthracene	–	0.019	–	0.00255	–	mg/kg
Dibenzofuran	–	0.075	–	–	–	mg/kg
Fluoranthene	–	0.11	0.0189	–	0.013	mg/kg
Fluorene	–	0.0094	0.00740	–	–	mg/kg
Indeno(1,2,3-cd)pyrene	–	0.070	0.0121	–	–	mg/kg
Methylene chloride	0.011	–	0.00334	–	0.018	mg/kg
Naphthalene	–	–	–	0.0296	–	mg/kg
Phenanthrene	–	0.046	0.0111	–	–	mg/kg
Pyrene	–	0.14	0.0164	–	0.015	mg/kg
Styrene	–	0.0012	–	–	0.0012	mg/kg
TPH-diesel range	20	–	–	–	28	mg/kg
TPH-diesel range EXT	27	–	–	–	43	mg/kg
TPH-motor oil	–	–	–	25	–	mg/kg

3-Part Test Evaluation:

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

[a] The 95% UCL result or maximum value, depending on data censorship, as described in the methodology section.

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

Analyte	Duplicate Analysis	Duplicate Analysis
	EXC	SPA
Aluminum	6.0%	1.0%
Barium	4.2%	8.2%
Calcium	3.5%	0.3%
Chromium	6.9%	3.9%
Copper	6.5%	3.2%
Iron	0.6%	5.6%
Magnesium	1.9%	3.6%
Manganese	0.3%	4.4%
Silicon	3.5%	2.4%
Vanadium	2.6%	13.3%
Zinc	2.1%	0.3%

[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 — Date 01/28/13 — Calc. No. 0100N-CA-V0163 — Rev. No. 0
Project 100-N Field Remediation — Job No. 14655 — Checked N. K. Schiffern — Date 01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 5 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Statistical Calculations

Verification Data - Excavation

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
EXC-6	J1PW11	7/25/12	3.4		0.61	72.6		0.070	0.45		0.030	1.6	B	0.90	0.11	B	0.038	12.0	JX	0.053	6.7	X	0.092	16.0		0.20	5.3		0.25	298	X	0.092
Duplicate of J1PW11	J1PW19	7/25/12	3.4		0.57	69.6		0.066	0.43		0.029	1.6	B	0.85	0.12	B	0.035	11.2	JX	0.050	6.6	X	0.086	15.0		0.19	4.8		0.23	299	X	0.086
EXC-1	J1PW06	7/25/12	3.5		0.61	41.6		0.070	0.50		0.031	1.0	B	0.91	0.097	B	0.038	16.7	JNXM	0.054	8.6	X	0.093	17.8		0.20	3.7		0.25	301	X	0.093
EXC-2	J1PW07	7/25/12	3.4		0.62	37.7		0.072	0.44		0.031	0.92	U	0.92	0.084	B	0.039	10.6	JX	0.055	6.9	X	0.094	17.7		0.20	3.5		0.25	253	X	0.094
EXC-3	J1PW08	7/25/12	1.9		0.59	56.9		0.067	0.15	U	0.15	0.87	U	0.87	0.036	B	0.036	3.7	JX	0.051	12.5	X	0.44	17.4		0.96	3.3		1.2	349	X	0.089
EXC-4	J1PW09	7/25/12	2.8		0.59	42.4		0.068	0.59		0.030	0.88	U	0.88	0.068	B	0.037	5.5	JX	0.052	9.6	X	0.090	16.0		0.19	3.3		0.24	309	X	0.090
EXC-5	J1PW10	7/25/12	4.2		0.63	46.6		0.073	0.43		0.032	0.94	U	0.94	0.14	B	0.039	12.2	JX	0.056	6.9	X	0.096	15.8		0.21	3.6		0.26	283	X	0.096
EXC-7	J1PW12	7/25/12	2.1		0.61	29.8		0.070	0.32		0.031	0.91	U	0.91	0.047	B	0.038	5.6	JX	0.054	4.6	X	0.093	10.2		0.20	2.4		0.25	166	X	0.093
EXC-8	J1PW13	7/25/12	3.1		0.57	49.1		0.066	0.55		0.029	0.85	U	0.85	0.094	B	0.036	9.4	JX	0.050	8.9	X	0.087	17.8		0.19	4.0		0.23	304	X	0.087
EXC-9	J1PW14	7/25/12	3.3		0.59	218		0.068	0.50		0.030	4.4		0.88	0.14	B	0.037	11.5	JX	0.052	7.8	X	0.090	252		0.20	112		0.24	309	X	0.090
EXC-10	J1PW15	7/25/12	4.2		0.67	59.3		0.077	0.47		0.033	2.0		0.99	0.21		0.041	14.6	JX	0.059	7.5	X	0.10	29.4		0.22	140		0.27	304	X	0.10
EXC-11	J1PW16	7/25/12	3.6		0.58	77.8		0.067	0.45		0.029	1.6	B	0.86	0.12	B	0.036	12.1	JX	0.051	6.7	X	0.088	14.1		0.19	5.5		0.24	301	X	0.088
EXC-12	J1PW17	7/25/12	4.9		0.66	54.7		0.076	0.45		0.033	1.2	B	0.98	0.11	B	0.041	16.6	JX	0.058	8.1	X	0.10	20.7		0.22	5.0		0.27	323	X	0.10
EXC-13	J1PW18	7/25/12	3.7		0.63	61.3		0.073	0.44		0.032	1.3	B	0.94	0.12	B	0.039	12.7	JX	0.055	6.9	X	0.095	16.1		0.21	4.2		0.26	286	X	0.095

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
EXC-6	J1PW11/ J1PW19	7/25/12	3.4	71.1	0.44	1.6	0.12	11.6	6.7	15.5	5.1	299
EXC-1	J1PW06	7/25/12	3.5	41.6	0.50	1.0	0.10	16.7	8.6	17.8	3.7	301
EXC-2	J1PW07	7/25/12	3.4	37.7	0.44	0.46	0.084	10.6	6.9	17.7	3.5	253
EXC-3	J1PW08	7/25/12	1.9	56.9	0.075	0.44	0.036	3.7	12.5	17.4	3.3	349
EXC-4	J1PW09	7/25/12	2.8	42.4	0.59	0.44	0.068	5.5	9.6	16.0	3.3	309
EXC-5	J1PW10	7/25/12	4.2	46.6	0.43	0.47	0.14	12.2	6.9	15.8	3.6	283
EXC-7	J1PW12	7/25/12	2.1	29.8	0.32	0.46	0.047	5.6	4.6	10.2	2.4	166
EXC-8	J1PW13	7/25/12	3.1	49.1	0.55	0.43	0.094	9.4	8.9	17.8	4.0	304
EXC-9	J1PW14	7/25/12	3.3	218	0.50	4.4	0.14	11.5	7.8	252	112	309
EXC-10	J1PW15	7/25/12	4.2	59.3	0.47	2.0	0.21	14.6	7.5	29.4	140	304
EXC-11	J1PW16	7/25/12	3.6	77.8	0.45	1.6	0.12	12.1	6.7	14.1	5.5	301
EXC-12	J1PW17	7/25/12	4.9	54.7	0.45	1.2	0.11	16.6	8.1	20.7	5.0	323
EXC-13	J1PW18	7/25/12	3.7	61.3	0.44	1.3	0.12	12.7	6.9	16.1	4.2	286

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), 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 normal 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	13	13	13	13	13	13	13	13	13	13
% < Detection limit	0%	0%	8%	46%	0%	0%	0%	0%	0%	0%
Mean	3.4	65.1	0.44	1.2	0.11	11.0	7.8	35.4	22.7	291
Standard deviation	0.82	47.8	0.13	1.1	0.045	4.1	1.9	65.2	46.2	43.6
95% UCL on mean	3.9	86.9	0.49	1.7	0.14	13.0	8.9	65.2	43.8	311
Maximum value	4.9	218	0.59	4.4	0.21	16.7	12.5	252	140	349
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	32 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW Protection
WAC 173-340 3-PART TEST										
95% UCL > Cleanup Limit?	NA	NO	NA	NO	NA	NA	NA	YES	YES	NA
> 10% above Cleanup Limit?	NA	NO	NA	NO	NA	NA	NA	YES	YES	NA
Any sample > 2X Cleanup Limit?	NA	NO	NA	NO	NA	NA	NA	YES	YES	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.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	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.	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.	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 01/28/13 — Calc. No. 0100N-CA-V0163 — Rev. No. 0

Project 100-N Field Remediation — Job No. 14655 — Checked N. K. Schiffern — Date 01/28/13

Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 6 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Statistical Calculations

Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Nickel			Silver			Vanadium			Zinc			TPH - diesel range			TPH - diesel range EXT			Acetone			Methylenechloride		
			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
EXC-6	J1PW11	7/25/12	12.3	JX	0.11	0.17	B	0.15	39.1		0.086	38.4	X	0.37	12000		670	18000		990	9.5	J	6.6	2.0	U	2.0
Duplicate of J1PW11	J1PW19	7/25/12	11.9	JX	0.11	0.17		0.14	38.1		0.081	37.6	X	0.34	5100		680	7600		1000	8.2	UJ	8.2	4.7	J	2.4
EXC-1	J1PW06	7/25/12	23.4	JXM	0.11	0.21		0.15	50.4		0.087	41.8	X	0.37	1700	J	660	1800	J	970	9.4	J	5.8	7.1	X	1.7
EXC-2	J1PW07	7/25/12	11.3	JX	0.12	0.15	B	0.15	43.7		0.089	37.9	X	0.37	840	J	680	1000	U	1000	8.7	J	6.7	12		2.0
EXC-3	J1PW08	7/25/12	6.7	JX	0.11	0.21		0.14	84.2		0.42	47.3	X	0.35	680	U	680	1000	U	1000	7.7	J	7.0	2.1	U	2.1
EXC-4	J1PW09	7/25/12	8.7	JX	0.11	0.17	B	0.14	63.6		0.084	46.9	X	0.36	640	U	640	940	U	940	7.2	UJ	7.2	3.3	J	2.1
EXC-5	J1PW10	7/25/12	12.7	JX	0.12	0.18	B	0.15	43.8		0.090	39.1	X	0.38	650	U	650	950	U	950	5.9	UJ	5.9	6.5		1.8
EXC-7	J1PW12	7/25/12	6.4	JX	0.11	0.16	B	0.15	28.7		0.087	24.6	X	0.37	690	J	660	1200	J	970	9.2	J	5.1	1.5	J	1.5
EXC-8	J1PW13	7/25/12	10.6	JX	0.11	0.21		0.14	59.4		0.081	46.4	X	0.34	1200	J	650	1200	J	950	6.5	J	5.7	6.2		1.7
EXC-9	J1PW14	7/25/12	16.7	JX	0.11	0.28		0.14	50.8		0.085	57.4	X	0.36	88000		650	120000		950	6.8	J	4.7	3.6	J	1.4
EXC-10	J1PW15	7/25/12	14.7	JX	0.12	0.41		0.16	47.9		0.095	69.7	X	0.40	7200		680	11000		1000	7.9	J	5.2	5.6		1.6
EXC-11	J1PW16	7/25/12	12.1	JX	0.11	0.18		0.14	37.8		0.083	43.4	X	0.35	990	J	680	1700	J	990	13	J	6.2	12		1.9
EXC-12	J1PW17	7/25/12	16.1	JX	0.12	0.21		0.16	44.0		0.094	44.2	X	0.40	2100	J	680	2400	J	990	8.0	J	6.3	8.6		1.9
EXC-13	J1PW18	7/25/12	12.4	JX	0.12	0.16	B	0.15	41.2		0.090	38.5	X	0.38	2700	J	660	4800		960	6.4	UJ	6.4	1.9	U	1.9

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Nickel mg/kg	Silver mg/kg	Vanadium mg/kg	Zinc mg/kg	TPH - diesel range ug/kg	TPH - diesel range EXT ug/kg	Acetone ug/kg	Methylenechloride ug/kg
EXC-6	J1PW11/ J1PW19	7/25/12	12.1	0.17	38.6	38.0	8550	12800	6.8	2.9
EXC-1	J1PW06	7/25/12	23.4	0.21	50.4	41.8	1700	1800	9.4	7.1
EXC-2	J1PW07	7/25/12	11.3	0.15	43.7	37.9	840	500	8.7	12
EXC-3	J1PW08	7/25/12	6.7	0.21	84.2	47.3	340	500	7.7	1.1
EXC-4	J1PW09	7/25/12	8.7	0.17	63.6	46.9	320	470	3.6	3.3
EXC-5	J1PW10	7/25/12	12.7	0.18	43.8	39.1	325	475	3.0	6.5
EXC-7	J1PW12	7/25/12	6.4	0.16	28.7	24.6	690	1200	9.2	1.5
EXC-8	J1PW13	7/25/12	10.6	0.21	59.4	46.4	1200	1200	6.5	6.2
EXC-9	J1PW14	7/25/12	16.7	0.28	50.8	57.4	88000	120000	6.8	3.6
EXC-10	J1PW15	7/25/12	14.7	0.41	47.9	69.7	7200	11000	7.9	5.6
EXC-11	J1PW16	7/25/12	12.1	0.18	37.8	43.4	990	1700	13	12
EXC-12	J1PW17	7/25/12	16.1	0.21	44.0	44.2	2100	2400	8.0	8.6
EXC-13	J1PW18	7/25/12	12.4	0.16	41.2	38.5	2700	4800	3.2	1.0

Statistical Computations

	Nickel	Silver	Vanadium	Zinc	TPH - diesel range	TPH - diesel range EXT	Acetone	Methylenechloride
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), 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 normal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.
N	13	13	13	13	13	13	13	13
% < Detection limit	0%	0%	0%	0%	23%	31%	23%	15%
Mean	12.6	0.21	48.8	44.2	8843	12219	7.2	5.5
Standard deviation	4.5	0.070	14.0	10.7	23929	32638	2.8	3.8
95% UCL on mean	15.5	0.24	56.5	49.1	19760	27110	8.6	11
Maximum value	23.4	0.41	84.2	69.7	88000	120000	13	12
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise	19.1 GW Protection	0.73 River Protection	85.1 GW Protection	67.8 River Protection	200000 ug/kg GW and River Protection	200000 ug/kg GW and River Protection	720000 ug/kg GW Protection	470 ug/kg River Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NO	NA	NA	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NA	NA	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	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 (0.73 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.	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-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 7 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Maximum Calculations

Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Mercury			Molybdenum			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene		
			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
EXC-6	J1PW11	7/25/12	0.0047	U	0.0047	0.24	U	0.24	15	J	3.1	48	X	3.2	93		6.4	94		4.2	75		7.2	39		4.0
Duplicate of J1PW11	J1PW19	7/25/12	0.0053	U	0.0053	0.22	U	0.22	10	J	3.0	15	X	3.2	32		6.4	40		4.2	17	JX	7.1	15		3.9
EXC-1	J1PW06	7/25/12	0.0053	U	0.0053	0.38	B	0.24	3.0	U	3.0	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1	7.1	U	7.1	3.9	U	3.9
EXC-2	J1PW07	7/25/12	0.0047	U	0.0047	0.26	B	0.24	3.0	U	3.0	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2	7.2	U	7.2	3.9	U	3.9
EXC-3	J1PW08	7/25/12	0.0047	U	0.0047	0.23	U	0.23	3.0	U	3.0	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1	7.1	U	7.1	3.9	U	3.9
EXC-4	J1PW09	7/25/12	0.0064	U	0.0064	0.23	U	0.23	3.1	U	3.1	3.2	U	3.2	6.5	U	6.5	4.2	U	4.2	7.3	U	7.3	4.0	U	4.0
EXC-5	J1PW10	7/25/12	0.0056	U	0.0056	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	7.1	U	7.1	3.9	U	3.9
EXC-7	J1PW12	7/25/12	0.0053	U	0.0053	0.24	U	0.24	3.0	U	3.0	3.1	U	3.1	6.3	U	6.3	4.1	U	4.1	7.1	U	7.1	3.9	U	3.9
EXC-8	J1PW13	7/25/12	0.0053	U	0.0053	0.23	U	0.23	3.0	U	3.0	3.2	U	3.2	6.4	U	6.4	4.2	U	4.2	7.2	U	7.2	3.9	U	3.9
EXC-9 [a]	J1PW14	7/25/12	0.0076	B	0.0057	0.23	U	0.23	1100	J	3.0	2700	J	3.2	3100	J	6.3	2500	J	4.2	1800	J	7.1	1600	J	3.9
Re-sample EXC-9	J1R505	10/31/12							1.11	J	3.57	2.32	J	3.57	30.9		3.57	14.4		3.57	21.6		3.57	8.79		3.57
EXC-10	J1PW15	7/25/12	0.0071	B	0.0056	0.44	B	0.26	13	J	3.0	54		3.2	59		6.4	65		4.2	44	X	7.2	27		3.9
EXC-11	J1PW16	7/25/12	0.0047	U	0.0047	0.23	U	0.23	3.1	U	3.1	3.2	U	3.2	6.5	U	6.5	4.2	U	4.2	7.2	U	7.2	4.0	U	4.0
EXC-12	J1PW17	7/25/12	0.0065	B	0.0055	0.26	U	0.26	3.0	U	3.0	3.2	U	3.2	6.3	U	6.3	4.2	U	4.2	7.1	U	7.1	3.9	U	3.9
EXC-13 [a]	J1PW18	7/25/12	0.0047	U	0.0047	0.25	U	0.25	3.0	J	3.0	7.8	JX	3.2	22		6.3	22		4.2	11	JX	7.1	20		3.9

Statistical Computations

	Mercury			Molybdenum			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene		
% < Detection limit	77%			77%			69%			69%			69%			69%			69%			69%		
Maximum value	0.0076			0.44			15			54			93			94			75			39		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	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		48000 ug/kg	GW Protection		15 ug/kg	River Protection	
3-PART TEST																								
Maximum > Cleanup Limit?	NA			NO			NO			YES			YES			YES			NO			YES		
> 10% above Cleanup Limit?	NA			NO			NO			YES			YES			YES			NO			YES		
Any sample > 2X Cleanup Limit?	NA			NO			NO			YES			YES			YES			NO			YES		
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.			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.		

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Maximum Calculations

Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Fluorene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene			2-Methylnaphthalene		
			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
EXC-6	J1PW11	7/25/12	84		4.9	19	JX	11	110		13	5.3	U	5.3	70		12	46		12	140		12	18	U	18
Duplicate of J1PW11	J1PW19	7/25/12	34	J	4.8	11	U	11	62		13	5.2	U	5.2	32		12	29	J	12	67		12	18	U	18
EXC-1	J1PW06	7/25/12	4.8	U	4.8	11	U	11	13	U	13	5.2	U	5.2	12	U	12	12	U	12	12	U	12	19	U	19
EXC-2	J1PW07	7/25/12	4.8	U	4.8	11	U	11	13	U	13	5.3	U	5.3	12	U	12	12	U	12	12	U	12	19	U	19
EXC-3	J1PW08	7/25/12	4.7	U	4.7	11	U	11	13	U	13	5.2	U	5.2	12	U	12	12	U	12	12	U	12	18	U	18
EXC-4	J1PW09	7/25/12	4.9	U	4.9	11	U	11	13	U	13	5.3	U	5.3	12	U	12	12	U	12	12	U	12	19	U	19
EXC-5	J1PW10	7/25/12	4.8	U	4.8	11	U	11	13	U	13	5.2	U	5.2	12	U	12	12	U	12	12	U	12	19	U	19
EXC-7	J1PW12	7/25/12	4.8	U	4.8	11	U	11	13	U	13	5.2	U	5.2	12	U	12	12	U	12	12	U	12	18	U	18
EXC-8	J1PW13	7/25/12	4.8	U	4.8	11	U	11	13	U	13	5.2	U	5.2	12	U	12	12	U	12	12	U	12	18	U	18
EXC-9 [a]	J1PW14	7/25/12	3300	J	4.8	470	JX	11	5700	J	13	760	J	5.2	12	U	12	4700	J	12	6200	J	12	31	J	19
Re-sample EXC-9	J1R505	10/31/12	17.2		3.57	2.32		3.57	28.4		3.57	3.57	U	3.57	21.5		3.57	14.6		3.57	21.4		3.57			
EXC-10	J1PW15	7/25/12	65		4.8	11	U	11	99	X	13	9.4	J	5.3	52		12	36	J	12	110		12	19	U	19
EXC-11	J1PW16	7/25/12	4.9	U	4.9	11	U	11	13	U	13	5.3	U	5.3	12	U	12	12	U	12	12	U	12	18	U	18
EXC-12	J1PW17	7/25/12	4.8	U	4.8	11	U	11	13	U	13	5.2	U	5.2	12	U	12	12	U	12	12	U	12	19	U	19
EXC-13 [a]	J1PW18	7/25/12	23	J	4.8	11	U	11	13	U	13	5.2	U	5.2	24	J	12	12	U	12	12	U	12	18	U	18
Re-sample EXC-13	J1R506	10/31/12																						371	U	371

Statistical Computations

	Chrysene			Dibenz(a,h)anthracene			Fluoranthene			Fluorene			Indeno(1,2,3-cd)pyrene			Phenanthrene			Pyrene			2-Methylnaphthalene		
% < Detection limit	69%			85%			77%			92%			69%			77%			77%			92%		
Maximum value	84			19			110			9.4			70			46			140			31		
Most Stringent Cleanup Limit for nonradionuclide and RAG type ug/kg	100	River Protection		30	GW & River Protection		18000	River Protection		64000	GW Protection		15	GW & River Protection		240000	GW Protection		48000	GW Protection		3200	GW Protection	
3-PART TEST																								
Maximum > Cleanup Limit?	NO			NO			NO			NO			YES			NO			NO			NO		
> 10% above Cleanup Limit?	NO			NO			NO			NO			YES			NO			NO			NO		
Any sample > 2X Cleanup Limit?	NO			NO			NO			NO			YES			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.			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] EXC-9, EXC-13, and FS-4 sample locations were remediated and re-sampled for failing analytes (Ecology 2012).

Washington Closure Hanford

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 8 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Maximum Calculations

Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Carbazole			Di-n-octylphthalate			Dibenzofuran			Styrene			Aroclor-1254			Aroclor-1260		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
EXC-6	J1PW11	7/25/12	35	U	35	14	U	14	19	U	19	0.77	UJ	0.77	2.6	U	2.6	2.6	U	2.6
Duplicate of J1PW11	J1PW19	7/25/12	35	U	35	14	U	14	19	U	19	0.95	UJ	0.95	2.6	U	2.6	2.6	U	2.6
EXC-1	J1PW06	7/25/12	35	U	35	76	J	14	20	U	20	0.68	UJX	0.68	2.5	U	2.5	2.5	U	2.5
EXC-2	J1PW07	7/25/12	36	U	36	14	U	14	20	U	20	1.2	J	0.78	2.6	U	2.6	2.6	U	2.6
EXC-3	J1PW08	7/25/12	35	U	35	14	U	14	19	U	19	0.82	UJ	0.82	2.5	U	2.5	2.5	U	2.5
EXC-4	J1PW09	7/25/12	36	U	36	14	U	14	20	U	20	0.84	UJ	0.84	2.6	U	2.6	2.6	U	2.6
EXC-5	J1PW10	7/25/12	36	U	36	14	U	14	20	U	20	0.69	UJ	0.69	2.5	U	2.5	2.5	U	2.5
EXC-7	J1PW12	7/25/12	34	U	34	14	U	14	19	U	19	0.60	UJ	0.60	2.6	U	2.6	2.6	U	2.6
EXC-8	J1PW13	7/25/12	35	U	35	14	U	14	19	U	19	0.67	UJ	0.67	2.4	U	2.4	2.4	U	2.4
EXC-9	J1PW14	7/25/12	210	J	36	14	U	14	75	J	20	0.55	UJ	0.55	16	J	2.6	10	JP	2.6
EXC-10	J1PW15	7/25/12	35	U	35	14	U	14	20	U	20	0.61	UJ	0.61	2.6	U	2.6	52		2.6
EXC-11	J1PW16	7/25/12	35	U	35	14	U	14	19	U	19	0.73	UJ	0.73	2.6	U	2.6	2.6	U	2.6
EXC-12	J1PW17	7/25/12	35	U	35	14	U	14	20	U	20	0.74	UJ	0.74	2.5	U	2.5	2.5	U	2.5
EXC-13	J1PW18	7/25/12	35	U	35	14	U	14	19	U	19	0.75	UJ	0.75	2.6	U	2.6	2.6	U	2.6
Re-sample EXC-13	J1R506	10/31/12	371	U	371	371	U	371	371	U	371									

Statistical Computations

	Carbazole	Di-n-octylphthalate	Dibenzofuran	Styrene	Aroclor-1254	Aroclor-1260
% < Detection limit	92%	92%	92%	92%	92%	85%
Maximum value	210	76	75	1.2	16	52
Most Stringent Cleanup Limit for nonradionuclide and RAG type ug/kg	437 GW Protection	32000 GW Protection	3200 GW Protection	33300 DE Protection	17 GW & River Protection	17 GW & River Protection
3-PART TEST						
Maximum > Cleanup Limit?	NO	NO	NO	NO	NO	YES
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	YES
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.	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.

[a] EXC-9, EXC-13, and FS-4 sample locations were remediated and re-sampled for failing analytes (Ecology 2012).

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 9 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Statistical Calculations

Verification Data - Staging Pile Area (SPA)

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			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
SPA-6	J1PW25	11/13/12	2.59	B	2.99	74.9		1.50	0.284	B	0.599	13.1		0.599	6.10		5.99	12.3		2.99	4.09		1.50	305		15.0
Duplicate of J1PW25	J1PW32	11/13/12	2.79		2.61	69.0		1.31	0.277	B	0.523	12.6		0.523	5.72		5.23	12.7		2.61	4.94		1.31	292		13.1
SPA-1	J1PW20	11/13/12	1.68	B	2.84	46.0		1.42	0.231	B	0.568	7.74		0.568	9.73		5.68	18.8		2.84	3.58		1.42	326		14.2
SPA-2	J1PW21	11/13/12	3.37		2.52	48.9		1.26	0.261	B	0.503	11.3		0.503	8.38		5.03	18.4		2.52	3.52		1.26	335		12.6
SPA-3	J1PW22	11/13/12	3.48		2.56	71.0		1.28	0.290	B	0.513	55.1		0.513	6.84		5.13	24.2		2.56	15.9		1.28	306		12.8
SPA-4	J1PW23	11/13/12	2.56	B	3.07	62.1		1.54	0.277	B	0.615	13.7		0.615	5.66	B	6.15	13.1		3.07	3.80		1.54	280		15.4
SPA-5	J1PW24	11/13/12	3.23		2.77	77.9		1.38	0.263	B	0.553	14.5		0.553	7.11		5.53	17.2		2.77	3.91		1.38	334		13.8
SPA-7	J1PW26	11/13/12	3.28		2.90	77.4		1.45	0.368	B	0.580	15.3		0.580	7.49		5.80	18.0		2.90	5.03		1.45	345		14.5
SPA-8	J1PW27	11/13/12	2.21	B	2.71	55.2		1.36	0.237	B	0.542	17.8		0.542	11.0		5.42	17.3		2.71	3.32		1.36	342		13.6
SPA-9	J1PW28	11/13/12	2.76		2.37	51.0		1.19	0.255	B	0.475	11.6		0.475	7.70		4.75	17.7		2.37	3.87		1.19	317		11.9
SPA-10	J1PW29	11/13/12	2.19	B	2.57	53.6		1.29	0.220	B	0.515	10.7		0.515	9.07		5.15	17.3		2.57	3.10		1.29	335		12.9
SPA-11	J1PW30	11/13/12	2.82		2.70	78.6		1.35	0.293	B	0.539	13.9		0.539	7.05		5.39	33.6		2.70	14.0		1.35	336		13.5
SPA-12	J1PW31	11/13/12	2.10	B	2.76	45.3		1.38	0.229	B	0.552	8.79		0.552	8.02		5.52	23.8		2.76	4.64		1.38	300		13.8

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
SPA-6	J1PW25/ J1PW32	11/13/12	2.69	72.0	0.281	12.9	5.91	12.5	4.52	299
SPA-1	J1PW20	11/13/12	1.68	46.0	0.231	7.74	9.73	18.8	3.58	326
SPA-2	J1PW21	11/13/12	3.37	48.9	0.261	11.3	8.38	18.4	3.52	335
SPA-3	J1PW22	11/13/12	3.48	71.0	0.290	55.1	6.84	24.2	15.9	306
SPA-4	J1PW23	11/13/12	2.56	62.1	0.277	13.7	5.66	13.1	3.80	280
SPA-5	J1PW24	11/13/12	3.23	77.9	0.263	14.5	7.11	17.2	3.91	334
SPA-7	J1PW26	11/13/12	3.28	77.4	0.368	15.3	7.49	18.0	5.03	345
SPA-8	J1PW27	11/13/12	2.21	55.2	0.237	17.8	11.0	17.3	3.32	342
SPA-9	J1PW28	11/13/12	2.76	51.0	0.255	11.6	7.70	17.7	3.87	317
SPA-10	J1PW29	11/13/12	2.19	53.6	0.220	10.7	9.07	17.3	3.10	335
SPA-11	J1PW30	11/13/12	2.82	78.6	0.293	13.9	7.05	33.6	14.0	336
SPA-12	J1PW31	11/13/12	2.10	45.3	0.229	8.79	8.02	23.8	4.64	300

Statistical Computations

	Arsenic	Barium	Beryllium	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), 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 normal distribution.
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%
Mean	2.70	61.6	0.267	16.1	7.83	19.3	5.77	321
Standard deviation	0.57	13.1	0.040	12.6	1.54	5.6	4.35	20.7
95% UCL on mean	3.07	69.6	0.289	22.1	8.73	22.0	7.83	332
Maximum value	3.48	78.6	0.368	55.1	11.0	33.6	15.9	345
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	18.5 GW & River Protection	32 GW Protection	22.0 River Protection	10.2 GW & River Protection	512 GW Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NA	NA	NA	YES	NA	NO	NO	NA
> 10% above Cleanup Limit?	NA	NA	NA	NO	NA	YES	YES	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	YES	NA	NO	NO	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.	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 (15.7 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.	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-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 10 of 20

1 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Statistical Calculations
2 Verification Data - Staging Pile Area (SPA)

3	Sample	Sample	Sample	Nickel			Vanadium			Zinc			Acenaphthene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
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
5	SPA-6	J1PW25	11/13/12	10.2	B	12.0	56.3		7.48	37.4		29.9	1.24	J	3.54	3.54	U	3.54	3.54	U	3.54	3.54	U	3.54	0.921	J	3.54
6	Duplicate of J1PW25	J1PW32	11/13/12	10.2	B	10.5	49.3		6.53	37.3		26.1	3.59	U	3.59	1.30	J	3.59	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59
7	SPA-1	J1PW20	11/13/12	8.16	B	11.4	69.3		7.10	50.7		28.4	0.88	J	3.32	1.73	J	3.32	3.32	U	3.32	3.32	U	3.32	3.32	U	3.32
8	SPA-2	J1PW21	11/13/12	10.8		10.1	65.8		6.29	47.4		25.2	2.86	J	3.53	3.53	U	3.53	3.53	U	3.53	3.53	U	3.53	3.53	U	3.53
9	SPA-3	J1PW22	11/13/12	13.1		10.3	49.9		6.41	63.7		25.6	75.1		3.75	27.7		3.75	23.3		3.75	20.5		3.75	31.4		3.75
10	SPA-4	J1PW23	11/13/12	10.6	B	12.3	48.8		7.68	34.7		30.7	3.58	U	3.58	3.58	U	3.58	3.58	U	3.58	3.58	U	3.58	3.58	U	3.58
11	SPA-5	J1PW24	11/13/12	13.4		11.1	52.2		6.92	42.4		27.7	21.2		3.62	8.43		3.62	10.1		3.62	6.13		3.62	10.9		3.62
12	SPA-7	J1PW26	11/13/12	12.9		11.6	53.0		7.25	41.9		29.0	3.73	U	3.73	3.73	U	3.73	3.73	U	3.73	3.73	U	3.73	3.73	U	3.73
13	SPA-8	J1PW27	11/13/12	54.2		10.8	62.9		6.78	46.5		27.1	19.4		3.46	7.16		3.46	6.52		3.46	3.50		3.46	5.78		3.46
14	SPA-9	J1PW28	11/13/12	10.6		9.49	60.3		5.93	45.3		23.7	5.06		3.47	3.06	J	3.47	1.53	J	3.47	1.08	J	3.47	1.65	J	3.47
15	SPA-10	J1PW29	11/13/12	10.4		10.3	63.4		6.43	45.3		25.7	9.99		3.62	2.16	J	3.62	1.67	J	3.62	1.20	J	3.62	1.47	J	3.62
16	SPA-11 [a]	J1PW30	11/13/12	12.3		10.8	58.9		6.74	51.9		27.0															
17	Re-Sample SPA-11	J1R794	12/18/12										33.2		3.51	16.6		3.51	19.1		3.51	11.6		3.51	12.4		3.51
18	SPA-12	J1PW31	11/13/12	9.92	B	11.0	61.9		6.89	52.9		27.6	37.6		3.48	12.5		3.48	14.7		3.48	8.94		3.48	17.7		3.48

19
20 Statistical Computation Input Data

21	Sample	Sample	Sample	Nickel			Vanadium			Zinc			Acenaphthene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
22	Area	Number	Date	mg/kg			mg/kg			mg/kg			ug/kg			ug/kg			ug/kg			ug/kg			ug/kg		
23	SPA-6	J1PW25/ J1PW32	11/13/12	10.2			52.8			37.4			1.52			1.54			1.78			1.78			1.36		
24	SPA-1	J1PW20	11/13/12	8.2			69.3			50.7			0.88			1.73			1.66			1.66			1.66		
25	SPA-2	J1PW21	11/13/12	10.8			65.8			47.4			2.86			1.77			1.77			1.77			1.77		
26	SPA-3	J1PW22	11/13/12	13.1			49.9			63.7			75.1			27.7			23.3			20.5			31.4		
27	SPA-4	J1PW23	11/13/12	10.6			48.8			34.7			1.79			1.79			1.79			1.79			1.79		
28	SPA-5	J1PW24	11/13/12	13.4			52.2			42.4			21.2			8.43			10.1			6.13			10.9		
29	SPA-7	J1PW26	11/13/12	12.9			53.0			41.9			1.87			1.87			1.87			1.87			1.87		
30	SPA-8	J1PW27	11/13/12	54.2			62.9			46.5			19.4			7.16			6.52			3.50			5.78		
31	SPA-9	J1PW28	11/13/12	10.6			60.3			45.3			5.06			3.06			1.53			1.08			1.65		
32	SPA-10	J1PW29	11/13/12	10.4			63.4			45.3			10.0			2.16			1.67			1.20			1.47		
33	SPA-11 [a]	J1PW30	11/13/12	12.3			58.9			51.9																	
34	Re-Sample SPA-11	J1R794	12/18/12										33.2			16.6			19.1			11.6			12.4		
35	SPA-12	J1PW31	11/13/12	9.92			61.9			52.9			37.6			12.5			14.7			8.94			17.7		

36 Statistical Computations

37		Nickel	Vanadium	Zinc	Acenaphthene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene
38	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), 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.
39	N	12	12	12	12	12	12	12	12
40	% < Detection limit	0%	0%	0%	17%	25%	42%	42%	33%
41	Mean	14.7	58.3	46.7	17.5	7.19	7.15	5.15	7.48
42	Standard deviation	12.5	6.73	7.67	22.2	8.15	7.84	5.91	9.31
43	95% UCL on mean	20.7	62.1	51.1	127	11.1	10.9	7.96	11.9
44	Maximum value	54.2	69.3	63.7	75.1	27.7	23.3	20.5	31.4
45	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise**	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	96,000 ug/kg GW Protection	15 ug/kg GW and River Protection	15 ug/kg GW and River Protection	15 ug/kg GW and River Protection	48,000 ug/kg GW Protection
46	**WAC 173-340 3-PART TEST**								
47	95% UCL > Cleanup Limit?	YES	NA	NA	NO	NO	NO	NO	NO
48	> 10% above Cleanup Limit?	NO	NA	NA	NO	YES	YES	NO	NO
49	Any sample > 2X Cleanup Limit?	YES	NA	NA	NO	NO	NO	NO	NO
50	**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.	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.	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.

51 [a] SPA-11 sample location was remediated and re-sampled for failing analytes.

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie — Date 01/28/13 — Calc. No. 0100N-CA-V0163 — Rev. No. 0

Project 100-N Field Remediation — Job No. 14655 — Checked N. K. Schiffern — Date 01/28/13

Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 11 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Statistical Calculations

Verification Data - Staging Pile Area (SPA)

Sample Area	Sample Number	Sample Date	Chrysene ug/kg	Q	PQL	Fluoranthene ug/kg	Q	PQL	Fluorene ug/kg	Q	PQL	Indeno(1,2,3-cd)pyrene ug/kg	Q	PQL	Phenanthrene ug/kg	Q	PQL	Pyrene ug/kg	Q	PQL	Methylenechloride ug/kg	Q	PQL
SPA-6	J1PW25	11/13/12	0.921	J	3.54	3.54	U	3.54	7.65		3.54	6.14		3.54	3.54	U	3.54	3.54	U	3.54	6.48	U	6.48
Duplicate of J1PW25	J1PW32	11/13/12	3.59	U	3.59	3.59	U	3.59	6.53		3.59	5.22		3.59	3.59	U	3.59	3.59	U	3.59	6.31	U	6.31
SPA-1	J1PW20	11/13/12	1.21	J	3.32	3.32	U	3.32	7.09		3.32	1.51	J	3.32	3.32	U	3.32	3.32	U	3.32	2.50	BJ	6.19
SPA-2	J1PW21	11/13/12	0.972	J	3.53	3.53	U	3.53	6.79		3.53	3.53	U	3.53	3.53	U	3.53	3.53	U	3.53	2.93	BJ	6.66
SPA-3	J1PW22	11/13/12	27.8		3.75	48.6		3.75	8.44		3.75	19.8		3.75	27.7		3.75	38.8		3.75	4.51	J	11.2
SPA-4	J1PW23	11/13/12	3.58	U	3.58	3.58	U	3.58	6.80		3.58	5.48		3.58	3.58	U	3.58	3.58	U	3.58	6.51	U	6.51
SPA-5	J1PW24	11/13/12	8.90		3.62	17.2		3.62	7.85		3.62	5.04		3.62	10.9		3.62	15.5		3.62	7.27	U	7.27
SPA-7	J1PW26	11/13/12	1.05	J	3.73	2.30	J	3.73	6.99		3.73	1.79	J	3.73	3.73	U	3.73	3.73	U	3.73	2.26	J	6.24
SPA-8	J1PW27	11/13/12	9.17		3.46	16.0		3.46	2.42	J	3.46	3.22	J	3.46	14.1		3.46	14.5		3.46	1.61	BJ	4.77
SPA-9	J1PW28	11/13/12	2.57	J	3.47	4.26		3.47	7.84		3.47	2.66	J	3.47	1.83	J	3.47	2.89	J	3.47	1.69	J	4.62
SPA-10	J1PW29	11/13/12	2.45	J	3.62	3.03	J	3.62	6.42		3.62	2.66	J	3.62	1.72	J	3.62	2.83	J	3.62	6.13	U	6.13
SPA-11 [a]	J1PW30	11/13/12																			1.95	J	5.62
Re-Sample SPA-11	J1R794	12/18/12	12.1		3.51	23.6		3.51	5.40		3.51	12.9		3.51	10.7		3.51	21.3		3.51			
SPA-12	J1PW31	11/13/12	22.1		3.48	23.0		3.48	7.25		3.48	10.9		3.48	11.8		3.48	23.2		3.48	2.67	J	5.69

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Chrysene ug/kg	Fluoranthene ug/kg	Fluorene ug/kg	Indeno(1,2,3-cd)pyrene ug/kg	Phenanthrene ug/kg	Pyrene ug/kg	Methylenechloride ug/kg
SPA-6	J1PW25/ J1PW32	11/13/12	1.36	1.78	7.09	5.68	1.78	1.78	3.20
SPA-1	J1PW20	11/13/12	1.21	1.66	7.09	1.51	1.66	1.66	2.50
SPA-2	J1PW21	11/13/12	0.97	1.77	6.79	1.77	1.77	1.77	2.93
SPA-3	J1PW22	11/13/12	27.8	48.6	8.44	19.8	27.7	38.8	4.51
SPA-4	J1PW23	11/13/12	1.79	1.79	6.80	5.48	1.79	1.79	3.26
SPA-5	J1PW24	11/13/12	8.90	17.2	7.85	5.04	10.9	15.5	3.64
SPA-7	J1PW26	11/13/12	1.05	2.30	6.99	1.79	1.87	1.87	2.26
SPA-8	J1PW27	11/13/12	9.17	16.0	2.42	3.22	14.1	14.5	1.61
SPA-9	J1PW28	11/13/12	2.57	4.26	7.84	2.66	1.83	2.89	1.69
SPA-10	J1PW29	11/13/12	2.45	3.03	6.42	2.66	1.72	2.83	3.07
SPA-11 [a]	J1PW30	11/13/12							1.95
Re-Sample SPA-11	J1R794	12/18/12	12.1	23.6	5.40	12.9	10.7	21.3	
SPA-12	J1PW31	11/13/12	22.1	23.0	7.25	10.9	11.8	23.2	2.67

Statistical Computations

	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Methylenechloride
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), 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
% < Detection limit	8%	33%	0%	8%	42%	42%	33%
Mean	7.62	12.1	6.70	6.12	7.30	10.7	2.77
Standard deviation	9.02	14.4	1.55	5.63	8.10	12.1	0.844
95% UCL on mean	28.8	18.9	7.40	12.1	11.1	16.4	3.34
Maximum value	27.8	48.6	8.44	19.8	27.7	38.8	4.51
Most Stringent Cleanup Limit for nonradionuclide and RAG type ug/kg	100 River Protection	18000 River Protection	64000 GW Protection	15 GW and River Protection	240000 GW Protection	48000 GW Protection	470 River Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NO	NO	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
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.

[a] SPA-11 sample location was remediated and re-sampled for failing analytes

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 12 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Maximum Calculations
Verification Data - Staging Pile Area (SPA)

Sample Area	Sample Number	Sample Date	Boron			Cadmium			Molybdenum			Selenium			TPH - Motor Oil			Acenaphthylene			Anthracene			Benzo(k)fluoranthene		
			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
SPA-6	J1PW25	11/13/12	2.00	B	5.99	0.599	U	0.599	5.99	U	5.99	0.898	U	0.898	10600	U	10600	3.54	U	3.54	3.54	U	3.54	3.54	U	3.54
Duplicate of J1PW25	J1PW32	11/13/12	2.02	B	5.23	0.523	U	0.523	5.23	U	5.23	0.784	U	0.784	10700	U	10700	3.59	U	3.59	3.59	U	3.59	3.59	U	3.59
SPA-1	J1PW20	11/13/12	5.68	U	5.68	0.568	U	0.568	5.68	U	5.68	0.852	U	0.852	10200	U	10200	3.32	U	3.32	3.32	U	3.32	3.32	U	3.32
SPA-2	J1PW21	11/13/12	5.03	U	5.03	0.503	U	0.503	5.03	U	5.03	0.755	U	0.755	10700	U	10700	3.53	U	3.53	3.53	U	3.53	3.53	U	3.53
SPA-3	J1PW22	11/13/12	3.18	B	5.13	0.176	B	0.513	0.736	B	5.13	0.799		0.769	7420	J	10800	6.43		3.75	3.21	J	3.75	9.32		3.75
SPA-4	J1PW23	11/13/12	6.15	U	6.15	0.615	U	0.615	6.15	U	6.15	0.922	U	0.922	10500	U	10500	3.58	U	3.58	3.58	U	3.58	3.58	U	3.58
SPA-5	J1PW24	11/13/12	5.53	U	5.53	0.553	U	0.553	5.53	U	5.53	0.830	U	0.830	10300	U	10300	3.62	U	3.62	3.62	U	3.62	3.63		3.62
SPA-7	J1PW26	11/13/12	1.79	B	5.80	0.580	U	0.580	5.80	U	5.80	0.870	U	0.870	11000	U	11000	3.73	U	3.73	3.73	U	3.73	3.73	U	3.73
SPA-8	J1PW27	11/13/12	2.33	B	5.42	0.542	U	0.542	5.42	U	5.42	0.814	U	0.814	10100	U	10100	3.03	J	3.46	3.46	U	3.46	2.82	J	3.46
SPA-9	J1PW28	11/13/12	4.75	U	4.75	0.475	U	0.475	4.75	U	4.75	0.712	U	0.712	10700	U	10700	3.47	U	3.47	3.47	U	3.47	3.47	U	3.47
SPA-10	J1PW29	11/13/12	5.15	U	5.15	0.515	U	0.515	5.15	U	5.15	0.772	U	0.772	10700	U	10700	3.62	U	3.62	3.62	U	3.62	3.62	U	3.62
SPA-11 [a]	J1PW30	11/13/12	2.05	B	5.39	0.138	B	0.539	5.39	U	5.39	0.809	U	0.809	25400		11300									
Re-Sample SPA-11	J1R794	12/18/12																3.51	U	3.51	3.51	U	3.51	5.89		3.51
SPA-12	J1PW31	11/13/12	5.52	U	5.52	0.552	U	0.552	5.52	U	5.52	0.827	U	0.827	5700	J	10800	3.48	U	3.48	1.39	J	3.48	5.58		3.48

Statistical Computations

	Boron	Cadmium	Molybdenum	Selenium	TPH - Motor Oil	Acenaphthylene	Anthracene	Benzo(k)fluoranthene
% < Detection limit	58%	83%	92%	92%	75%	83%	83%	75%
Maximum value	3.18	0.176	0.736	0.799	25400	6.43	3.21	9.32
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	320 GW Protection	0.81 GW & River Protection	8 GW Protection	1 River Protection	200,000 ug/kg GW & River Protection	96,000 ug/kg GW Protection	240000 ug/kg GW Protection	15 ug/kg River Protection
3-PART TEST								
Maximum > Cleanup Limit?	NO	NA	NO	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NA	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NA	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.	Because all values are below background (0.81 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.

[a] SPA-11 sample location was remediated and re-sampled for failing analytes.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 13 of 20

100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Maximum Calculations
Verification Data - Staging Pile Area (SPA)

Sample Area	Sample Number	Sample Date	Bis(2-ethylhexyl) phthalate			Dibenz(a,h)anthracene			Naphthalene			Aroclor-1254			Aroclor-1260			Acetone		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SPA-6	J1PW25	11/13/12	355	U	355	3.54	U	3.54	3.54	U	3.54	14.3	U	14.3	14.3	U	14.3	13.0	U	13.0
Duplicate of J1PW25	J1PW32	11/13/12	356	U	356	3.59	U	3.59	3.59	U	3.59	14.2	U	14.2	14.2	U	14.2	12.6	U	12.6
SPA-1	J1PW20	11/13/12	337	U	337	3.32	U	3.32	3.32	U	3.32	13.4	U	13.4	5.30	J	13.4	12.4	U	12.4
SPA-2	J1PW21	11/13/12	348	U	348	3.53	U	3.53	3.53	U	3.53	14.0	U	14.0	14.0	U	14.0	13.3	U	13.3
SPA-3	J1PW22	11/13/12	132	J	375	2.55	J	3.75	29.6		3.75	34.1		14.9	72.6		14.9	22.3	U	22.3
SPA-4	J1PW23	11/13/12	357	U	357	3.58	U	3.58	3.58	U	3.58	14.3	U	14.3	14.3	U	14.3	13.0	U	13.0
SPA-5	J1PW24	11/13/12	355	U	355	0.961	J	3.62	9.07		3.62	14.0	U	14.0	14.0	U	14.0	14.5	U	14.5
SPA-7	J1PW26	11/13/12	369	U	369	3.73	U	3.73	3.73	U	3.73	14.7	U	14.7	14.7	U	14.7	12.5	U	12.5
SPA-8	J1PW27	11/13/12	336	U	336	3.46	U	3.46	18.3		3.46	13.3	U	13.3	13.3	U	13.3	4.56	J	9.55
SPA-9	J1PW28	11/13/12	354	U	354	3.47	U	3.47	3.47	U	3.47	13.9	U	13.9	13.9	U	13.9	9.24	U	9.24
SPA-10	J1PW29	11/13/12	359	U	359	3.62	U	3.62	3.62	U	3.62	14.5	U	14.5	14.5	U	14.5	12.3	U	12.3
SPA-11 [a]	J1PW30	11/13/12										4.94	J	14.7	15.8		14.7	11.2	U	11.2
Re-Sample SPA-11	J1R794	12/18/12	353	U	353	2.29	J	3.51	13.0		3.51									
SPA-12	J1PW31	11/13/12	353	U	353	1.69	J	3.48	14.9		3.48	14.4	U	14.4	7.31	J	14.4	11.4	U	11.4

Statistical Computations

	Bis(2-ethylhexyl) phthalate	Dibenz(a,h)anthracene	Naphthalene	Aroclor-1254	Aroclor-1260	Acetone
% < Detection limit	92%	67%	58%	83%	67%	92%
Maximum value	132	2.55	29.6	34.1	72.6	4.56
Most Stringent Cleanup Limit for nonradionuclide and RAG type ug/kg	360 River Protection	30 GW & River Protection	16000 GW Protection	17 GW & River Protection	17 GW & River Protection	720000 GW Protection
3-PART TEST						
Maximum > Cleanup Limit?	NO	NO	NO	YES	YES	NO
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	YES	YES	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.	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] SPA-11 sample location was remediated and re-sampled for failing analytes.

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

CALCULATION SHEET

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 14 of 20

Ecology Software (MTCAStat) Results, 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

Arsenic 95% UCL Calculation

DATA	ID
3.4	J1PW11/ J1PW19
3.5	J1PW06
3.4	J1PW07
1.9	J1PW08
2.8	J1PW09
4.2	J1PW10
2.1	J1PW12
3.1	J1PW13
3.3	J1PW14
4.2	J1PW15
3.6	J1PW16
4.9	J1PW17
3.7	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	3.4
Censored		Lognormal mean	3.4
Detection limit or PQL		Std. devn.	0.82
Method detection limit		Median	3.4
TOTAL	13	Min.	1.9
		Max.	4.9

Lognormal distribution? r-squared is: 0.913
Normal distribution? r-squared is: 0.956
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 3.9

Barium 95% UCL Calculation

DATA	ID
71.1	J1PW11/ J1PW19
41.6	J1PW06
37.7	J1PW07
56.9	J1PW08
42.4	J1PW09
46.6	J1PW10
29.8	J1PW12
49.1	J1PW13
218	J1PW14
59.3	J1PW15
77.8	J1PW16
54.7	J1PW17
61.3	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	65.1
Censored		Lognormal mean	63.6
Detection limit or PQL		Std. devn.	47.8
Method detection limit		Median	54.7
TOTAL	13	Min.	29.8
		Max.	218

Lognormal distribution? r-squared is: 0.816
Normal distribution? r-squared is: 0.549
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 86.9

Beryllium 95% UCL Calculation

DATA	ID
0.44	J1PW11/ J1PW19
0.50	J1PW06
0.44	J1PW07
0.075	J1PW08
0.59	J1PW09
0.43	J1PW10
0.32	J1PW12
0.55	J1PW13
0.50	J1PW14
0.47	J1PW15
0.45	J1PW16
0.45	J1PW17
0.44	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	0.44
Censored		Lognormal mean	0.46
Detection limit or PQL		Std. devn.	0.13
Method detection limit		Median	0.45
TOTAL	13	Min.	0.075
		Max.	0.59

Lognormal distribution? r-squared is: 0.522
Normal distribution? r-squared is: 0.743
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.49

Boron 95% UCL Calculation

DATA	ID
1.6	J1PW11/ J1PW19
1.0	J1PW06
0.46	J1PW07
0.44	J1PW08
0.44	J1PW09
0.47	J1PW10
0.46	J1PW12
0.43	J1PW13
4.4	J1PW14
2.0	J1PW15
1.6	J1PW16
1.2	J1PW17
1.3	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	1.2
Censored		Lognormal mean	1.2
Detection limit or PQL		Std. devn.	1.1
Method detection limit		Median	1.0
TOTAL	13	Min.	0.43
		Max.	4.4

Lognormal distribution? r-squared is: 0.870
Normal distribution? r-squared is: 0.709
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.7

Cadmium 95% UCL Calculation

DATA	ID
0.12	J1PW11/ J1PW19
0.097	J1PW06
0.084	J1PW07
0.036	J1PW08
0.068	J1PW09
0.14	J1PW10
0.047	J1PW12
0.094	J1PW13
0.14	J1PW14
0.21	J1PW15
0.12	J1PW16
0.11	J1PW17
0.12	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	0.11
Censored		Lognormal mean	0.11
Detection limit or PQL		Std. devn.	0.045
Method detection limit		Median	0.11
TOTAL	13	Min.	0.036
		Max.	0.21

Lognormal distribution? r-squared is: 0.930
Normal distribution? r-squared is: 0.938
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.14

Chromium 95% UCL Calculation

DATA	ID
11.6	J1PW11/ J1PW19
16.7	J1PW06
10.6	J1PW07
3.7	J1PW08
5.5	J1PW09
12.2	J1PW10
5.6	J1PW12
9.4	J1PW13
11.5	J1PW14
14.6	J1PW15
12.1	J1PW16
16.6	J1PW17
12.7	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	11.0
Censored		Lognormal mean	11.2
Detection limit or PQL		Std. devn.	4.1
Method detection limit		Median	11.6
TOTAL	13	Min.	3.7
		Max.	16.7

Lognormal distribution? r-squared is: 0.864
Normal distribution? r-squared is: 0.942
Recommendations:
Use normal distribution

UCL (based on t-statistic) is 13.0

Cobalt 95% UCL Calculation

DATA	ID
6.7	J1PW11/ J1PW19
8.6	J1PW06
6.9	J1PW07
12.5	J1PW08
9.6	J1PW09
6.9	J1PW10
4.6	J1PW12
8.9	J1PW13
7.8	J1PW14
7.5	J1PW15
6.7	J1PW16
8.1	J1PW17
6.9	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	7.8
Censored		Lognormal mean	7.8
Detection limit or PQL		Std. devn.	1.9
Method detection limit		Median	7.5
TOTAL	13	Min.	4.6
		Max.	12.5

Lognormal distribution? r-squared is: 0.914
Normal distribution? r-squared is: 0.882
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 8.9

Copper 95% UCL Calculation

DATA	ID
15.5	J1PW11/ J1PW19
17.8	J1PW06
17.7	J1PW07
17.4	J1PW08
16.0	J1PW09
15.8	J1PW10
10.2	J1PW12
17.8	J1PW13
252	J1PW14
29.4	J1PW15
14.1	J1PW16
20.7	J1PW17
16.1	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	35.4
Censored		Lognormal mean	28.3
Detection limit or PQL		Std. devn.	65.2
Method detection limit		Median	17.4
TOTAL	13	Min.	10.2
		Max.	252

Lognormal distribution? r-squared is: 0.542
Normal distribution? r-squared is: 0.333
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 65.2

Lead 95% UCL Calculation

DATA	ID
5.1	J1PW11/ J1PW19
3.7	J1PW06
3.5	J1PW07
3.3	J1PW08
3.3	J1PW09
3.6	J1PW10
2.4	J1PW12
4.0	J1PW13
112	J1PW14
140	J1PW15
5.5	J1PW16
5.0	J1PW17
4.2	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	22.7
Censored		Lognormal mean	15.9
Detection limit or PQL		Std. devn.	46.2
Method detection limit		Median	4.0
TOTAL	13	Min.	2.4
		Max.	140

Lognormal distribution? r-squared is: 0.600
Normal distribution? r-squared is: 0.467
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 43.8

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 15 of 20

Ecology Software (MTCAStat) Results, 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

Manganese 95% UCL Calculation

DATA	ID
299	J1PW11/ J1PW19
301	J1PW06
253	J1PW07
349	J1PW08
309	J1PW09
283	J1PW10
166	J1PW12
304	J1PW13
309	J1PW14
304	J1PW15
301	J1PW16
323	J1PW17
286	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	291
Censored		Lognormal mean	292
Detection limit or PQL		Std. devn.	43.6
Method detection limit		Median	301
TOTAL	13	Min.	166
		Max.	349

Lognormal distribution? r-squared is: 0.647
Normal distribution? r-squared is: 0.735
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 311

Nickel 95% UCL Calculation

DATA	ID
12.1	J1PW11/ J1PW19
23.4	J1PW06
11.3	J1PW07
6.7	J1PW08
8.7	J1PW09
12.7	J1PW10
6.4	J1PW12
10.6	J1PW13
16.7	J1PW14
14.7	J1PW15
12.1	J1PW16
16.1	J1PW17
12.4	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	12.6
Censored		Lognormal mean	12.7
Detection limit or PQL		Std. devn.	4.5
Method detection limit		Median	12.1
TOTAL	13	Min.	6.4
		Max.	23.4

Lognormal distribution? r-squared is: 0.956
Normal distribution? r-squared is: 0.920
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 15.5

Silver 95% UCL Calculation

DATA	ID
0.17	J1PW11/ J1PW19
0.21	J1PW06
0.15	J1PW07
0.21	J1PW08
0.17	J1PW09
0.18	J1PW10
0.16	J1PW12
0.21	J1PW13
0.28	J1PW14
0.41	J1PW15
0.18	J1PW16
0.21	J1PW17
0.16	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	0.21
Censored		Lognormal mean	0.21
Detection limit or PQL		Std. devn.	0.070
Method detection limit		Median	0.18
TOTAL	13	Min.	0.15
		Max.	0.41

Lognormal distribution? r-squared is: 0.809
Normal distribution? r-squared is: 0.692
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.24

Vanadium 95% UCL Calculation

DATA	ID
38.6	J1PW11/ J1PW19
50.4	J1PW06
43.7	J1PW07
84.2	J1PW08
63.6	J1PW09
43.8	J1PW10
28.7	J1PW12
59.4	J1PW13
50.8	J1PW14
47.9	J1PW15
37.8	J1PW16
44.0	J1PW17
41.2	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	48.8
Censored		Lognormal mean	48.9
Detection limit or PQL		Std. devn.	14.0
Method detection limit		Median	44.0
TOTAL	13	Min.	28.7
		Max.	84.2

Lognormal distribution? r-squared is: 0.947
Normal distribution? r-squared is: 0.878
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 56.5

Zinc 95% UCL Calculation

DATA	ID
38.0	J1PW11/ J1PW19
41.8	J1PW06
37.9	J1PW07
47.3	J1PW08
46.9	J1PW09
39.1	J1PW10
24.6	J1PW12
46.4	J1PW13
57.4	J1PW14
69.7	J1PW15
43.4	J1PW16
44.2	J1PW17
38.5	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	44.2
Censored		Lognormal mean	44.4
Detection limit or PQL		Std. devn.	10.7
Method detection limit		Median	43.4
TOTAL	13	Min.	24.6
		Max.	69.7

Lognormal distribution? r-squared is: 0.889
Normal distribution? r-squared is: 0.879
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 49.1

TPH - diesel range 95% UCL Calculation

DATA	ID
8550	J1PW11/ J1PW19
1700	J1PW06
840	J1PW07
340	J1PW08
320	J1PW09
325	J1PW10
690	J1PW12
1200	J1PW13
88000	J1PW14
7200	J1PW15
990	J1PW16
2100	J1PW17
2700	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	8843
Censored		Lognormal mean	6141
Detection limit or PQL		Std. devn.	23929
Method detection limit		Median	1200
TOTAL	13	Min.	320
		Max.	88000

Lognormal distribution? r-squared is: 0.885
Normal distribution? r-squared is: 0.361
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 19760

TPH - diesel range EXT 95% UCL Calculation

DATA	ID
12800	J1PW11/ J1PW19
1800	J1PW06
500	J1PW07
500	J1PW08
470	J1PW09
475	J1PW10
1200	J1PW12
1200	J1PW13
120000	J1PW14
11000	J1PW15
1700	J1PW16
2400	J1PW17
4800	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	12219
Censored		Lognormal mean	8779
Detection limit or PQL		Std. devn.	32638
Method detection limit		Median	1700
TOTAL	13	Min.	470
		Max.	120000

Lognormal distribution? r-squared is: 0.870
Normal distribution? r-squared is: 0.370
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 27110

Acetone 95% UCL Calculation

DATA	ID
6.8	J1PW11/ J1PW19
9.4	J1PW06
8.7	J1PW07
7.7	J1PW08
3.6	J1PW09
3.0	J1PW10
9.2	J1PW12
6.5	J1PW13
6.8	J1PW14
7.9	J1PW15
13	J1PW16
8.0	J1PW17
3.2	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	7.2
Censored		Lognormal mean	7.3
Detection limit or PQL		Std. devn.	2.8
Method detection limit		Median	7.7
TOTAL	13	Min.	3.0
		Max.	13

Lognormal distribution? r-squared is: 0.883
Normal distribution? r-squared is: 0.930
Recommendations:
Use normal distribution

UCL (based on t-statistic) is 8.6

Methylene chloride 95% UCL Calculation

DATA	ID
2.9	J1PW11/ J1PW19
7.1	J1PW06
12	J1PW07
1.1	J1PW08
3.3	J1PW09
6.5	J1PW10
1.5	J1PW12
6.2	J1PW13
3.6	J1PW14
5.6	J1PW15
12	J1PW16
8.6	J1PW17
0.95	J1PW18

Number of samples		Uncensored values	
Uncensored	13	Mean	5.5
Censored		Lognormal mean	6.0
Detection limit or PQL		Std. devn.	3.8
Method detection limit		Median	5.6
TOTAL	13	Min.	1.0
		Max.	12

Lognormal distribution? r-squared is: 0.937
Normal distribution? r-squared is: 0.935
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 16 of 20

Ecology Software (MTCAStat) Results, 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Staging Pile Area

Arsenic 95% UCL Calculation

DATA	ID
2.69	J1PW25/ J1PW32
1.68	J1PW20
3.37	J1PW21
3.48	J1PW22
2.56	J1PW23
3.23	J1PW24
3.28	J1PW26
2.21	J1PW27
2.76	J1PW28
2.19	J1PW29
2.82	J1PW30
2.10	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	2.70
Censored		Lognormal mean	2.71
Detection limit or PQL		Std. devn.	0.57
Method detection limit		Median	2.73
TOTAL	12	Min.	1.68
		Max.	3.48

Lognormal distribution? r-squared is: 0.944
Normal distribution? r-squared is: 0.961
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 3.07

Barium 95% UCL Calculation

DATA	ID
72.0	J1PW25/ J1PW32
46.0	J1PW20
48.9	J1PW21
71.0	J1PW22
62.1	J1PW23
77.9	J1PW24
77.4	J1PW26
55.2	J1PW27
51.0	J1PW28
53.6	J1PW29
78.6	J1PW30
45.3	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	61.6
Censored		Lognormal mean	61.7
Detection limit or PQL		Std. devn.	13.1
Method detection limit		Median	58.7
TOTAL	12	Min.	45.3
		Max.	78.6

Lognormal distribution? r-squared is: 0.914
Normal distribution? r-squared is: 0.906
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 69.6

Beryllium 95% UCL Calculation

DATA	ID
0.281	J1PW25/ J1PW32
0.231	J1PW20
0.261	J1PW21
0.290	J1PW22
0.277	J1PW23
0.263	J1PW24
0.368	J1PW26
0.237	J1PW27
0.255	J1PW28
0.220	J1PW29
0.293	J1PW30
0.229	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	0.267
Censored		Lognormal mean	0.267
Detection limit or PQL		Std. devn.	0.040
Method detection limit		Median	0.262
TOTAL	12	Min.	0.220
		Max.	0.368

Lognormal distribution? r-squared is: 0.918
Normal distribution? r-squared is: 0.870
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.289

Chromium 95% UCL Calculation

DATA	ID
12.9	J1PW25/ J1PW32
7.74	J1PW20
11.3	J1PW21
55.1	J1PW22
13.7	J1PW23
14.5	J1PW24
15.3	J1PW26
17.8	J1PW27
11.6	J1PW28
10.7	J1PW29
13.9	J1PW30
8.79	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	16.1
Censored		Lognormal mean	15.7
Detection limit or PQL		Std. devn.	12.6
Method detection limit		Median	13.3
TOTAL	12	Min.	7.74
		Max.	55.1

Lognormal distribution? r-squared is: 0.759
Normal distribution? r-squared is: 0.509
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 22.1

Cobalt 95% UCL Calculation

DATA	ID
5.91	J1PW25/ J1PW32
9.73	J1PW20
8.38	J1PW21
6.84	J1PW22
5.66	J1PW23
7.11	J1PW24
7.49	J1PW26
11.0	J1PW27
7.70	J1PW28
9.07	J1PW29
7.05	J1PW30
8.02	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	7.83
Censored		Lognormal mean	7.84
Detection limit or PQL		Std. devn.	1.54
Method detection limit		Median	7.60
TOTAL	12	Min.	5.66
		Max.	11.0

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

UCL (Land's method) is 8.73

Copper 95% UCL Calculation

DATA	ID
12.5	J1PW25/ J1PW32
18.8	J1PW20
18.4	J1PW21
24.2	J1PW22
13.1	J1PW23
17.2	J1PW24
18.0	J1PW26
17.3	J1PW27
17.7	J1PW28
17.3	J1PW29
33.6	J1PW30
23.8	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	19.3
Censored		Lognormal mean	19.3
Detection limit or PQL		Std. devn.	5.65
Method detection limit		Median	17.9
TOTAL	12	Min.	12.5
		Max.	33.6

Lognormal distribution? r-squared is: 0.893
Normal distribution? r-squared is: 0.818
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 22.0

Lead 95% UCL Calculation

DATA	ID
4.52	J1PW25/ J1PW32
3.58	J1PW20
3.52	J1PW21
15.9	J1PW22
3.80	J1PW23
3.91	J1PW24
5.03	J1PW26
3.32	J1PW27
3.87	J1PW28
3.10	J1PW29
14.0	J1PW30
4.64	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	5.77
Censored		Lognormal mean	5.63
Detection limit or PQL		Std. devn.	4.35
Method detection limit		Median	3.89
TOTAL	12	Min.	3.10
		Max.	15.9

Lognormal distribution? r-squared is: 0.707
Normal distribution? r-squared is: 0.591
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 7.83

Manganese 95% UCL Calculation

DATA	ID
299	J1PW25/ J1PW32
326	J1PW20
335	J1PW21
306	J1PW22
280	J1PW23
334	J1PW24
345	J1PW26
342	J1PW27
317	J1PW28
335	J1PW29
336	J1PW30
300	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	321
Censored		Lognormal mean	321
Detection limit or PQL		Std. devn.	20.7
Method detection limit		Median	330
TOTAL	12	Min.	280
		Max.	345

Lognormal distribution? r-squared is: 0.899
Normal distribution? r-squared is: 0.908
Recommendations:
Use normal distribution

UCL (based on t-statistic) is 332

Nickel 95% UCL Calculation

DATA	ID
10.2	J1PW25/ J1PW32
8.16	J1PW20
10.8	J1PW21
13.1	J1PW22
10.6	J1PW23
13.4	J1PW24
12.9	J1PW26
54.2	J1PW27
10.6	J1PW28
10.4	J1PW29
12.3	J1PW30
9.92	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	14.7
Censored		Lognormal mean	14.1
Detection limit or PQL		Std. devn.	12.5
Method detection limit		Median	10.7
TOTAL	12	Min.	8.16
		Max.	54.2

Lognormal distribution? r-squared is: 0.572
Normal distribution? r-squared is: 0.407
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 20.7

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations

Date 01/28/13
Job No. 14655

Calc. No. 0100N-CA-V0163
Checked N. K. Schiffern

Rev. No. 0
Date 01/28/13
Sheet No. 17 of 20

Ecology Software (MTCAStat) Results, 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Staging Pile Area

Vanadium 95% UCL Calculation

DATA	ID
52.8	J1PW25/ J1PW32
69.3	J1PW20
65.8	J1PW21
49.9	J1PW22
48.8	J1PW23
52.2	J1PW24
53.0	J1PW26
62.9	J1PW27
60.3	J1PW28
63.4	J1PW29
58.9	J1PW30
61.9	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	58.3
Censored		Lognormal mean	58.3
Detection limit or PQL		Std. devn.	6.73
Method detection limit		Median	59.6
TOTAL	12	Min.	48.8
		Max.	69.3

Lognormal distribution? r-squared is: 0.949
Normal distribution? r-squared is: 0.952
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 62.1

Zinc 95% UCL Calculation

DATA	ID
37.4	J1PW25/ J1PW32
50.7	J1PW20
47.4	J1PW21
63.7	J1PW22
34.7	J1PW23
42.4	J1PW24
41.9	J1PW26
46.5	J1PW27
45.3	J1PW28
45.3	J1PW29
51.9	J1PW30
52.9	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	46.7
Censored		Lognormal mean	46.7
Detection limit or PQL		Std. devn.	7.67
Method detection limit		Median	45.9
TOTAL	12	Min.	34.7
		Max.	63.7

Lognormal distribution? r-squared is: 0.969
Normal distribution? r-squared is: 0.948
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 51.1

Acenaphthene 95% UCL Calculation

DATA	ID
1.52	J1PW25/ J1PW32
0.88	J1PW20
2.86	J1PW21
75.1	J1PW22
1.79	J1PW23
21.2	J1PW24
1.87	J1PW26
19.4	J1PW27
5.06	J1PW28
9.99	J1PW29
33.2	J1R794
37.6	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	17.5
Censored		Lognormal mean	22.3
Detection limit or PQL		Std. devn.	22.2
Method detection limit		Median	7.53
TOTAL	12	Min.	0.88
		Max.	75.1

Lognormal distribution? r-squared is: 0.950
Normal distribution? r-squared is: 0.764
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 127

Benzo(a)anthracene 95% UCL Calculation

DATA	ID
1.54	J1PW25/ J1PW32
1.73	J1PW20
1.77	J1PW21
27.7	J1PW22
1.79	J1PW23
8.43	J1PW24
1.87	J1PW26
7.16	J1PW27
3.06	J1PW28
2.16	J1PW29
16.6	J1R794
12.5	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	7.19
Censored		Lognormal mean	7.31
Detection limit or PQL		Std. devn.	8.15
Method detection limit		Median	2.61
TOTAL	12	Min.	1.54
		Max.	27.7

Lognormal distribution? r-squared is: 0.867
Normal distribution? r-squared is: 0.742
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 11.1

Benzo(a)pyrene 95% UCL Calculation

DATA	ID
1.78	J1PW25/ J1PW32
1.66	J1PW20
1.77	J1PW21
23.3	J1PW22
1.79	J1PW23
10.1	J1PW24
1.87	J1PW26
6.52	J1PW27
1.53	J1PW28
1.67	J1PW29
19.1	J1R794
14.7	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	7.15
Censored		Lognormal mean	7.42
Detection limit or PQL		Std. devn.	7.84
Method detection limit		Median	1.83
TOTAL	12	Min.	1.53
		Max.	23.3

Lognormal distribution? r-squared is: 0.796
Normal distribution? r-squared is: 0.762
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 10.9

Benzo(b)fluoranthene 95% UCL Calculation

DATA	ID
1.78	J1PW25/ J1PW32
1.66	J1PW20
1.77	J1PW21
20.5	J1PW22
1.79	J1PW23
6.13	J1PW24
1.87	J1PW26
3.50	J1PW27
1.08	J1PW28
1.20	J1PW29
11.6	J1R794
8.94	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	5.15
Censored		Lognormal mean	5.11
Detection limit or PQL		Std. devn.	5.91
Method detection limit		Median	1.83
TOTAL	12	Min.	1.08
		Max.	20.5

Lognormal distribution? r-squared is: 0.881
Normal distribution? r-squared is: 0.712
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 7.96

Benzo(ghi)perylene 95% UCL Calculation

DATA	ID
1.36	J1PW25/ J1PW32
1.66	J1PW20
1.77	J1PW21
31.4	J1PW22
1.79	J1PW23
10.9	J1PW24
1.87	J1PW26
5.78	J1PW27
1.65	J1PW28
1.47	J1PW29
12.4	J1R794
17.7	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	7.48
Censored		Lognormal mean	7.62
Detection limit or PQL		Std. devn.	9.31
Method detection limit		Median	1.83
TOTAL	12	Min.	1.36
		Max.	31.4

Lognormal distribution? r-squared is: 0.828
Normal distribution? r-squared is: 0.713
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 11.9

Chrysene 95% UCL Calculation

DATA	ID
1.36	J1PW25/ J1PW32
1.21	J1PW20
0.97	J1PW21
27.8	J1PW22
1.79	J1PW23
8.90	J1PW24
1.05	J1PW26
9.17	J1PW27
2.57	J1PW28
2.45	J1PW29
12.1	J1R794
22.1	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	7.62
Censored		Lognormal mean	8.28
Detection limit or PQL		Std. devn.	9.02
Method detection limit		Median	2.51
TOTAL	12	Min.	0.97
		Max.	27.8

Lognormal distribution? r-squared is: 0.908
Normal distribution? r-squared is: 0.768
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 28.8

Fluoranthene 95% UCL Calculation

DATA	ID
1.78	J1PW25/ J1PW32
1.66	J1PW20
1.77	J1PW21
48.6	J1PW22
1.79	J1PW23
17.2	J1PW24
2.30	J1PW26
16.0	J1PW27
4.26	J1PW28
3.03	J1PW29
23.6	J1R794
23.0	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	12.1
Censored		Lognormal mean	13.3
Detection limit or PQL		Std. devn.	14.4
Method detection limit		Median	3.65
TOTAL	12	Min.	1.66
		Max.	48.6

Lognormal distribution? r-squared is: 0.863
Normal distribution? r-squared is: 0.753
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 18.9

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie	**Date** 01/28/13	**Calc. No.** 0100N-CA-V0163	**Rev. No.** 0
Project 100-N Field Remediation	**Job No.** 14655	**Checked** N. K. Schiffern	**Date** 01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 18 of 20

Ecology Software (MTCAStat) Results, 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Staging Pile Area

Fluorene 95% UCL Calculation

DATA	ID
7.09	J1PW25/ J1PW32
7.09	J1PW20
6.79	J1PW21
8.44	J1PW22
6.80	J1PW23
7.85	J1PW24
6.99	J1PW26
2.42	J1PW27
7.84	J1PW28
6.42	J1PW29
5.40	J1R794
7.25	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	6.70
Censored		Lognormal mean	6.80
Detection limit or PQL		Std. devn.	1.55
Method detection limit		Median	7.04
TOTAL	12	Min.	2.42
		Max.	8.44

Lognormal distribution? r-squared is: 0.608
Normal distribution? r-squared is: 0.755
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 7.40

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

DATA	ID
5.68	J1PW25/ J1PW32
1.51	J1PW20
1.77	J1PW21
19.8	J1PW22
5.48	J1PW23
5.04	J1PW24
1.79	J1PW26
3.22	J1PW27
2.66	J1PW28
2.66	J1PW29
12.9	J1R794
10.9	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	6.12
Censored		Lognormal mean	6.21
Detection limit or PQL		Std. devn.	5.63
Method detection limit		Median	4.13
TOTAL	12	Min.	1.51
		Max.	19.8

Lognormal distribution? r-squared is: 0.950
Normal distribution? r-squared is: 0.791
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 12.1

Phenanthrene 95% UCL Calculation

DATA	ID
1.78	J1PW25/ J1PW32
1.66	J1PW20
1.77	J1PW21
27.7	J1PW22
1.79	J1PW23
10.9	J1PW24
1.87	J1PW26
14.1	J1PW27
1.83	J1PW28
1.72	J1PW29
10.7	J1R794
11.8	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	7.30
Censored		Lognormal mean	7.60
Detection limit or PQL		Std. devn.	8.10
Method detection limit		Median	1.85
TOTAL	12	Min.	1.66
		Max.	27.7

Lognormal distribution? r-squared is: 0.770
Normal distribution? r-squared is: 0.728
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 11.1

Pyrene 95% UCL Calculation

DATA	ID
1.78	J1PW25/ J1PW32
1.66	J1PW20
1.77	J1PW21
38.8	J1PW22
1.79	J1PW23
15.5	J1PW24
1.87	J1PW26
14.5	J1PW27
2.89	J1PW28
2.83	J1PW29
21.3	J1R794
23.2	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	10.7
Censored		Lognormal mean	11.7
Detection limit or PQL		Std. devn.	12.1
Method detection limit		Median	2.86
TOTAL	12	Min.	1.66
		Max.	38.8

Lognormal distribution? r-squared is: 0.827
Normal distribution? r-squared is: 0.777
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 16.4

Methylene Chloride 95% UCL Calculation

DATA	ID
3.20	J1PW25/ J1PW32
2.50	J1PW20
2.93	J1PW21
4.51	J1PW22
3.26	J1PW23
3.64	J1PW24
2.26	J1PW26
1.61	J1PW27
1.69	J1PW28
3.07	J1PW29
1.95	J1PW30
2.67	J1PW31

Number of samples		Uncensored values	
Uncensored	12	Mean	2.77
Censored		Lognormal mean	2.79
Detection limit or PQL		Std. devn.	0.84
Method detection limit		Median	2.80
TOTAL	12	Min.	1.61
		Max.	4.51

Lognormal distribution? r-squared is: 0.975
Normal distribution? r-squared is: 0.967
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 3.34

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie **Date** 01/28/13 **Calc. No.** 0100N-CA-V0163 **Rev. No.** 0
Project 100-N Field Remediation **Job No.** 14655 **Checked** N. K. Schiffern **Date** 01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 19 of 20

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

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
EXC-6	J1PW11	7/25/12	8700		1.4	3.4		0.61	72.6		0.070	0.45		0.030	1.6	B	0.90	0.11	B	0.038	3750	X	12.9	12.0	JX	0.053	6.7	X	0.092
Duplicate of J1PW11	J1PW19	7/25/12	8190		1.3	3.4		0.57	69.6		0.066	0.43		0.029	1.6	B	0.85	0.12	B	0.035	3620	X	12.2	11.2	JX	0.050	6.6	X	0.086

Analysis:

	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	6.0%		4.2%				3.5%	6.9%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

Sampling Area	Sample Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese			Nickel			Potassium			Silicon			Silver		
			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
EXC-6	J1PW11	7/25/12	16.0		0.20	17500	X	3.5	5.3		0.25	4220	J	3.4	298	X	0.092	12.3	JX	0.11	1880		37.6	557	JX	5.2	0.17	B	0.15
Duplicate of J1PW11	J1PW19	7/25/12	15.0		0.19	17400	X	3.3	4.8		0.23	4140	J	3.2	299	X	0.086	11.9	JX	0.11	1750		35.4	577	JX	4.9	0.17		0.14

Analysis:

	TDL	1	5	5	75	5	4	400	2	0.2
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)	No-Stop (acceptable)
	RPD	6.5%	0.6%		1.9%	0.3%			3.5%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

Sampling Area	Sample Number	Sample Date	Sodium			Vanadium			Zinc			TPH - diesel range			TPH - diesel range EXT			Anthracene (Method 8310 - PAH)			Benzo(a)anthracene (Method 8310 - PAH)			Benzo(a)pyrene (Method 8310 - PAH)			Benzo(b)fluoranthene (Method 8310 - PAH)		
			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
EXC-6	J1PW11	7/25/12	205		54.2	39.1		0.086	38.4	X	0.37	12000		670	18000		990	15	J	3.1	48	X	3.2	93		6.4	94		4.2
Duplicate of J1PW11	J1PW19	7/25/12	191		51.0	38.1		0.081	37.6	X	0.34	5100		680	7600		1000	10	J	3.0	15	X	3.2	32		6.4	40		4.2

Analysis:

	TDL	50	2.5	1	5000	5000	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		2.6%	2.1%						
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	Yes - assess further	No - acceptable	Yes - assess further	Yes - assess further	Yes - assess further

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

Sampling Area	Sample Number	Sample Date	Benzo(ghi)perylene (Method 8310 - PAH)			Benzo(k)fluoranthene (Method 8310 - PAH)			Chrysene (Method 8310 - PAH)			Fluoranthene (Method 8310 - PAH)			Indeno(1,2,3-cd)pyrene (Method 8310 - PAH)			Phenanthrene (Method 8310 - PAH)			Pyrene (Method 8310 - PAH)			Benzo(a)anthracene (Method 8270 - SVOA)			Benzo(a)pyrene (Method 8270 - 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
EXC-6	J1PW11	7/25/12	75		7.2	39		4.0	84		4.9	110		13	70		12	46		12	140		12	65	J	19	92	J	19
Duplicate of J1PW11	J1PW19	7/25/12	17	JX	7.1	15		3.9	34	J	4.8	62		13	32		12	29	J	12	67		12	24	J	19	26	J	19

Analysis:

	TDL	15	15	15	15	15	15	15	660	660
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)	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?	Yes - assess further	No - acceptable	Yes - assess further	Yes - assess further	Yes - assess further	No - acceptable	Yes - assess further	No - acceptable	No - acceptable

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Excavation

Sampling Area	Sample Number	Sample Date	Benzo(b)fluoranthene (Method 8270 - SVOA)			Benzo(ghi)perylene (Method 8270 - SVOA)			Chrysene (Method 8270 - SVOA)			Pyrene (Method 8270 - SVOA)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
EXC-6	J1PW11	7/25/12	150	JX	25	71	J	16	94	J	26	120	J	12
Duplicate of J1PW11	J1PW19	7/25/12	42	JX	25	20	J	15	27	J	26	34	J	12

Analysis:

	TDL	660	660	660	660
Duplicate Analysis	Both > PQL?	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

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie **Date** 01/28/13 **Calc. No.** 0100N-CA-V0163 **Rev. No.** 0
Project 100-N Field Remediation **Job No.** 14655 **Checked** N. K. Schiffern **Date** 01/28/13
Subject 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 20 of 20

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Staging Pile Area

Sampling Area	Sample Number	Sample Date	Aluminum			Arsenic			Barium			Beryllium			Boron			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
SPA-6	J1PW25	11/13/12	8280		15.0	2.59	B	2.99	74.9		1.50	0.284	B	0.599	2.00	B	5.99	3910		299	13.1		0.599	6.10		5.99	12.3		2.99
Duplicate of J1PW25	J1PW32	11/13/12	8360		13.1	2.79		2.61	69.0		1.31	0.277	B	0.523	2.02	B	5.23	3900		261	12.6		0.523	5.72		5.23	12.7		2.61

Analysis:

	TDL	5	10	2	0.2	2	100	1	2	1
Duplicate Analysis	Both > PQL?	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**		**Yes (calc RPD)**			**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	1.0%		8.2%			0.3%	3.9%		3.2%
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Staging Pile Area

Sampling Area	Sample Number	Sample Date	Iron			Lead			Magnesium			Manganese			Nickel			Potassium			Silicon			Sodium			Vanadium		
			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
SPA-6	J1PW25	11/13/12	20100		59.9	4.09		1.50	3680		225	305		15.0	10.2	B	12.0	1410		1200	586		5.99	225		150	56.3		7.48
Duplicate of J1PW25	J1PW32	11/13/12	19000		52.3	4.94		1.31	3550		196	292		13.1	10.2	B	10.5	1400		1050	600		5.23	242		131	49.3		6.53

Analysis:

	TDL	5	5	75	5	4	400	2	50	2.5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**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)**	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	5.6%		3.6%	4.4%			2.4%		13.3%
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable

Duplicate Analysis - 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Site Staging Pile Area

Sampling Area	Sample Number	Sample Date	Zinc			Fluorene (Method 8310 - PAH)			Indeno(1,2,3-cd)pyrene (Method 8310 - PAH)		
			mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SPA-6	J1PW25	11/13/12	37.4		29.9	7.65		3.54	6.14		3.54
Duplicate of J1PW25	J1PW32	11/13/12	37.3		26.1	6.53		3.59	5.22		3.59

Analysis:

	TDL	1	15	15
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	0.3%		
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Metals).

LOCATION	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			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
EXC-6	J1PW11	7/25/12	8700		1.4	0.35	UJ	0.35	3.4		0.61	72.6		0.070	0.45		0.030	1.6	B	0.90	0.11	B	0.038
Duplicate of J1PW11	J1PW19	7/25/12	8190		1.3	0.33	UJ	0.33	3.4		0.57	69.6		0.066	0.43		0.029	1.6	B	0.85	0.12	B	0.035
EXC-1	J1PW06	7/25/12	6950		1.4	0.35	UJ	0.35	3.5		0.61	41.6		0.070	0.50		0.031	1.0	B	0.91	0.097	B	0.038
EXC-2	J1PW07	7/25/12	6840		1.5	0.36	UJ	0.36	3.4		0.62	37.7		0.072	0.44		0.031	0.92	U	0.92	0.084	B	0.039
EXC-3	J1PW08	7/25/12	4440		1.4	0.34	UJ	0.34	1.9		0.59	56.9		0.067	0.15	U	0.15	0.87	U	0.87	0.036	B	0.036
EXC-4	J1PW09	7/25/12	5500		1.4	0.34	UJ	0.34	2.8		0.59	42.4		0.068	0.59		0.030	0.88	U	0.88	0.068	B	0.037
EXC-5	J1PW10	7/25/12	6870		1.5	0.37	UJ	0.37	4.2		0.63	46.6		0.073	0.43		0.032	0.94	U	0.94	0.14	B	0.039
EXC-7	J1PW12	7/25/12	4490		1.4	0.35	UJ	0.35	2.1		0.61	29.8		0.070	0.32		0.031	0.91	U	0.91	0.047	B	0.038
EXC-8	J1PW13	7/25/12	6200		1.3	0.33	UJ	0.33	3.1		0.57	49.1		0.066	0.55		0.029	0.85	U	0.85	0.094	B	0.036
EXC-9	J1PW14	7/25/12	8020		1.4	0.34	UJ	0.34	3.3		0.59	218		0.068	0.50		0.030	4.4		0.88	0.14	B	0.037
EXC-10	J1PW15	7/25/12	7600		1.6	0.38	UJ	0.38	4.2		0.67	59.3		0.077	0.47		0.033	2.0		0.99	0.21		0.041
EXC-11	J1PW16	7/25/12	9260		1.4	0.33	UJ	0.33	3.6		0.58	77.8		0.067	0.45		0.029	1.6	B	0.86	0.12	B	0.036
EXC-12	J1PW17	7/25/12	8750		1.5	0.38	UJ	0.38	4.9		0.66	54.7		0.076	0.45		0.033	1.2	B	0.98	0.11	B	0.041
EXC-13	J1PW18	7/25/12	8010		1.5	0.36	UJ	0.36	3.7		0.63	61.3		0.073	0.44		0.032	1.3	B	0.94	0.12	B	0.039
FS-1	J1PW34	7/25/12	5580		1.5	0.38	U	0.38	2.7		0.66	34.1		0.076	0.43		0.033	0.98	U	0.98	0.089	B	0.041
FS-2	J1PW35	7/25/12	5500		1.4	0.34	U	0.34	4.1		0.58	41.5		0.067	0.55		0.029	1.4	B	0.87	0.17	B	0.036
FS-3	J1PW36	7/25/12	6310		1.4	0.35	U	0.35	2.8		0.60	44.3		0.070	0.44		0.030	0.93	B	0.90	0.069	B	0.038
FS-4	J1PW37	7/25/12	7760		1.3	0.32	U	0.32	3.3		0.56	49.4		0.064	0.49		0.028	1.5	B	0.83	0.10	B	0.035
EXC-9 TCLP	J1PW14	7/25/12							0.022	U	0.022	0.49	B	0.0020							0.0028	B	0.0020

LOCATION	HEIS Number	Sample Date	Calcium			Chromium			Cobalt			Copper			Iron			Lead			Magnesium		
			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
EXC-6	J1PW11	7/25/12	3750	X	12.9	12.0	JX	0.053	6.7	X	0.092	16.0		0.20	17500	X	3.5	5.3		0.25	4220	J	3.4
Duplicate of J1PW11	J1PW19	7/25/12	3620	X	12.2	11.2	JX	0.050	6.6	X	0.086	15.0		0.19	17400	X	3.3	4.8		0.23	4140	J	3.2
EXC-1	J1PW06	7/25/12	8540	X	13.1	16.7	NJXM	0.054	8.6	X	0.093	17.8		0.20	20900	X	3.5	3.7		0.25	6770	JM	3.4
EXC-2	J1PW07	7/25/12	8260	X	13.3	10.6	JX	0.055	6.9	X	0.094	17.7		0.20	18200	X	3.6	3.5		0.25	4600	J	3.5
EXC-3	J1PW08	7/25/12	6020	X	12.5	3.7	JX	0.051	12.5	X	0.44	17.4		0.96	26100	X	3.4	3.3		1.2	4830	J	16.4
EXC-4	J1PW09	7/25/12	6470	X	12.6	5.5	JX	0.052	9.6	X	0.090	16.0		0.19	25700	X	3.4	3.3		0.24	4770	J	3.3
EXC-5	J1PW10	7/25/12	9910	X	13.6	12.2	JX	0.056	6.9	X	0.096	15.8		0.21	17700	X	3.7	3.6		0.26	5070	J	3.6
EXC-7	J1PW12	7/25/12	2910	X	13.1	5.6	JX	0.054	4.6	X	0.093	10.2		0.20	12200	X	3.5	2.4		0.25	2740	J	3.4
EXC-8	J1PW13	7/25/12	9160	X	12.2	9.4	JX	0.050	8.9	X	0.087	17.8		0.19	23300	X	3.3	4.0		0.23	4790	J	3.2
EXC-9	J1PW14	7/25/12	6330	X	12.7	11.5	JX	0.052	7.8	X	0.090	252		0.20	21500	X	3.4	112		0.24	4530	J	3.3
EXC-10	J1PW15	7/25/12	5960	X	14.2	14.6	JX	0.059	7.5	X	0.10	29.4		0.22	24100	X	3.8	140		0.27	4550	J	3.7
EXC-11	J1PW16	7/25/12	4710	X	12.4	12.1	JX	0.051	6.7	X	0.088	14.1		0.19	17500	X	3.3	5.5		0.24	4410	J	3.2
EXC-12	J1PW17	7/25/12	18100	X	14.1	16.6	JX	0.058	8.1	X	0.10	20.7		0.22	19500	X	3.8	5.0		0.27	6250	J	3.7
EXC-13	J1PW18	7/25/12	12400	X	13.5	12.7	JX	0.055	6.9	X	0.095	16.1		0.21	17800	X	3.6	4.2		0.26	5220	J	3.5
FS-1	J1PW34	7/25/12	7460		14.0	8.3		0.058	7.0	X	0.10	13.6		0.22	18500		3.8	3.0		0.27	4250		3.7
FS-2	J1PW35	7/25/12	11700		12.5	7.7		0.051	9.3	X	0.089	21.8		0.19	23000		3.4	8.0		0.24	5230		3.3
FS-3	J1PW36	7/25/12	8420		12.9	10.7		0.053	7.7	X	0.092	16.4		0.20	19400		3.5	3.7		0.25	4730		3.4
FS-4	J1PW37	7/25/12	3880		11.9	11.4		0.049	7.2	X	0.085	20.6		0.18	18800		3.2	6.8		0.23	4240		3.1
EXC-9 TCLP	J1PW14	7/25/12				0.0031	UJBC	0.0030										0.15	B	0.013			

Note: Data qualified with B, C, and/or J are considered acceptable values.

[a] EXC-9, EXC-13, and FS-4 sample locations were remediated and re-sampled for failing analytes (WCH 2012).

B = blank contamination (inorganic constituents)
C = </= 5x blank concentration
EXC = excavation
FS = focused sample
HEIS = Hanford Environmental Information System
J = estimate
M = duplicate precision not met.
N = recovery outside control limits
P = target analyte with >40% difference between column analyses.
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyls
PQL = practical quantitation limit
Q = qualifier
SVOA = semi volatile organic analysis
TCLP = toxicity characteristic leaching procedure
TPH = total petroleum hydrocarbons
U = undetected
VOA = volatile organic analysis
X = >40% difference between primary and confirmation detector results.

Attachment	1	Sheet No.	1 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Metals).

LOCATION	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium			Selenium			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
EXC-6	J1PW11	7/25/12	298	X	0.092	0.0047	U	0.0047	0.24	U	0.24	12.3	JX	0.11	1880		37.6	0.79	U	0.79	557	JX	5.2
Duplicate of J1PW11	J1PW19	7/25/12	299	X	0.086	0.0053	U	0.0053	0.22	U	0.22	11.9	JX	0.11	1750		35.4	0.74	U	0.74	577	JX	4.9
EXC-1	J1PW06	7/25/12	301	X	0.093	0.0053	U	0.0053	0.38	B	0.24	23.4	JXM	0.11	1190		38.0	0.80	U	0.80	324	JNX	5.2
EXC-2	J1PW07	7/25/12	253	X	0.094	0.0047	U	0.0047	0.26	B	0.24	11.3	JX	0.12	1050		38.6	0.81	U	0.81	344	JX	5.3
EXC-3	J1PW08	7/25/12	349	X	0.089	0.0047	U	0.0047	0.23	U	0.23	6.7	JX	0.11	697		36.4	0.76	U	0.76	297	JX	5.0
EXC-4	J1PW09	7/25/12	309	X	0.090	0.0064	U	0.0064	0.23	U	0.23	8.7	JX	0.11	856		36.7	0.77	U	0.77	297	JX	5.1
EXC-5	J1PW10	7/25/12	283	X	0.096	0.0056	U	0.0056	0.25	U	0.25	12.7	JX	0.12	1130		39.4	0.83	U	0.83	298	JX	5.4
EXC-7	J1PW12	7/25/12	166	X	0.093	0.0053	U	0.0053	0.24	U	0.24	6.4	JX	0.11	663		38.0	0.80	U	0.80	622	JX	5.2
EXC-8	J1PW13	7/25/12	304	X	0.087	0.0053	U	0.0053	0.23	U	0.23	10.6	JX	0.11	1040		35.5	0.75	U	0.75	338	JX	4.9
EXC-9	J1PW14	7/25/12	309	X	0.090	0.0076	B	0.0057	0.23	U	0.23	16.7	JX	0.11	1450		36.9	0.77	U	0.77	456	JX	5.1
EXC-10	J1PW15	7/25/12	304	X	0.10	0.0071	B	0.0056	0.44	B	0.26	14.7	JX	0.12	1260		41.4	0.87	U	0.87	405	JX	5.7
EXC-11	J1PW16	7/25/12	301	X	0.088	0.0047	U	0.0047	0.23	U	0.23	12.1	JX	0.11	1740		36.0	0.76	U	0.76	461	JX	5.0
EXC-12	J1PW17	7/25/12	323	X	0.10	0.0065	B	0.0055	0.26	U	0.26	16.1	JX	0.12	1380		40.9	0.86	U	0.86	508	JX	5.6
EXC-13	J1PW18	7/25/12	286	X	0.095	0.0047	U	0.0047	0.25	U	0.25	12.4	JX	0.12	1280		39.1	0.82	U	0.82	501	JX	5.4
FS-1	J1PW34	7/25/12	260		0.10	0.0056	U	0.0056	0.26	U	0.26	9.7		0.12	792		40.8	0.86	U	0.86	228		5.6
FS-2	J1PW35	7/25/12	298		0.089	0.021		0.0062	0.23	U	0.23	11.0		0.11	957		36.3	0.76	U	0.76	239		5.0
FS-3	J1PW36	7/25/12	278		0.092	0.0055	U	0.0055	0.24	U	0.24	11.7		0.11	936		37.6	0.79	U	0.79	280		5.2
FS-4	J1PW37	7/25/12	280		0.085	0.0086	B	0.0057	0.22	U	0.22	11.7		0.10	1550		34.7	0.73	U	0.73	304		4.8
EXC-9 TCLP	J1PW14	7/25/12				0.000030	U	0.000030										0.051	BMC	0.024			

LOCATION	HEIS Number	Sample Date	Silver			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
EXC-6	J1PW11	7/25/12	0.17	B	0.15	205		54.2	39.1		0.086	38.4	X	0.37
Duplicate of J1PW11	J1PW19	7/25/12	0.17		0.14	191		51.0	38.1		0.081	37.6	X	0.34
EXC-1	J1PW06	7/25/12	0.21		0.15	420		54.7	50.4		0.087	41.8	X	0.37
EXC-2	J1PW07	7/25/12	0.15	B	0.15	384		55.6	43.7		0.089	37.9	X	0.37
EXC-3	J1PW08	7/25/12	0.21		0.14	332		52.4	84.2		0.42	47.3	X	0.35
EXC-4	J1PW09	7/25/12	0.17	B	0.14	385		52.8	63.6		0.084	46.9	X	0.36
EXC-5	J1PW10	7/25/12	0.18	B	0.15	403		56.7	43.8		0.090	39.1	X	0.38
EXC-7	J1PW12	7/25/12	0.16	B	0.15	154		54.7	28.7		0.087	24.6	X	0.37
EXC-8	J1PW13	7/25/12	0.21		0.14	343		51.1	59.4		0.081	46.4	X	0.34
EXC-9	J1PW14	7/25/12	0.28		0.14	294		53.1	50.8		0.085	57.4	X	0.36
EXC-10	J1PW15	7/25/12	0.41		0.16	251		59.5	47.9		0.095	69.7	X	0.40
EXC-11	J1PW16	7/25/12	0.18		0.14	250		51.8	37.8		0.083	43.4	X	0.35
EXC-12	J1PW17	7/25/12	0.21		0.16	283		58.8	44.0		0.094	44.2	X	0.40
EXC-13	J1PW18	7/25/12	0.16	B	0.15	247		56.3	41.2		0.090	38.5	X	0.38
FS-1	J1PW34	7/25/12	0.16	U	0.16	225		58.8	46.9		0.094	37.3	X	0.40
FS-2	J1PW35	7/25/12	0.60		0.14	414		52.3	59.0		0.083	60.5	X	0.35
FS-3	J1PW36	7/25/12	0.20		0.15	318		54.0	46.7		0.086	39.4	X	0.36
FS-4	J1PW37	7/25/12	0.24		0.14	191		49.9	43.6		0.080	39.9	X	0.34
EXC-9 TCLP	J1PW14	7/25/12	0.0040	U	0.0040									

Attachment	1	Sheet No.	2 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Metals).

LOCATION	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			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
SPA-6	J1PW25	11/13/12	8280		15.0	1.80	U	1.80	2.59	B	2.99	74.9		1.50	0.284	B	0.599	2.00	B	5.99	0.599	U	0.599
Duplicate of J1PW25	J1PW32	11/13/12	8360		13.1	1.57	U	1.57	2.79		2.61	69.0		1.31	0.277	B	0.523	2.02	B	5.23	0.523	U	0.523
SPA-1	J1PW20	11/13/12	5370		14.2	1.70	U	1.70	1.68	B	2.84	46.0		1.42	0.231	B	0.568	5.68	U	5.68	0.568	U	0.568
SPA-2	J1PW21	11/13/12	6270		12.6	1.51	U	1.51	3.37		2.52	48.9		1.26	0.261	B	0.503	5.03	U	5.03	0.503	U	0.503
SPA-3	J1PW22	11/13/12	8240		12.8	1.54	U	1.54	3.48		2.56	71.0		1.28	0.290	B	0.513	3.18	B	5.13	0.176	B	0.513
SPA-4	J1PW23	11/13/12	8060		15.4	1.84	U	1.84	2.56	B	3.07	62.1		1.54	0.277	B	0.615	6.15	U	6.15	0.615	U	0.615
SPA-5	J1PW24	11/13/12	7760		13.8	1.66	U	1.66	3.23		2.77	77.9		1.38	0.263	B	0.553	5.53	U	5.53	0.553	U	0.553
SPA-7	J1PW26	11/13/12	10300		14.5	1.74	U	1.74	3.28		2.90	77.4		1.45	0.368	B	0.580	1.79	B	5.80	0.580	U	0.580
SPA-8	J1PW27	11/13/12	6110		13.6	1.63	U	1.63	2.21	B	2.71	55.2		1.36	0.237	B	0.542	2.33	B	5.42	0.542	U	0.542
SPA-9	J1PW28	11/13/12	6810		11.9	1.42	U	1.42	2.76		2.37	51.0		1.19	0.255	B	0.475	4.75	U	4.75	0.475	U	0.475
SPA-10	J1PW29	11/13/12	5900		12.9	1.54	U	1.54	2.19	B	2.57	53.6		1.29	0.220	B	0.515	5.15	U	5.15	0.515	U	0.515
SPA-11	J1PW30	11/13/12	8220		13.5	1.62	U	1.62	2.82		2.70	78.6		1.35	0.293	B	0.539	2.05	B	5.39	0.138	B	0.539
SPA-12	J1PW31	11/13/12	6190		13.8	1.65	U	1.65	2.10	B	2.76	45.3		1.38	0.229	B	0.552	5.52	U	5.52	0.552	U	0.552
Equipment Blank	J1PW33	11/13/12	271		3.79	0.455	U	0.455	0.371	B	0.758	3.62		0.379	0.0778	B	0.152	1.52	U	1.52	0.152	U	0.152

LOCATION	HEIS Number	Sample Date	Calcium			Chromium			Cobalt			Copper			Iron			Lead			Magnesium		
			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
SPA-6	J1PW25	11/13/12	3910		299	13.1		0.599	6.10		5.99	12.3		2.99	20100		59.9	4.09		1.50	3680		225
Duplicate of J1PW25	J1PW32	11/13/12	3900		261	12.6		0.523	5.72		5.23	12.7		2.61	19000		52.3	4.94		1.31	3550		196
SPA-1	J1PW20	11/13/12	5720		284	7.74		0.568	9.73		5.68	18.8		2.84	27500		56.8	3.58		1.42	4860		213
SPA-2	J1PW21	11/13/12	8130		252	11.3		0.503	8.38		5.03	18.4		2.52	25400		50.3	3.52		1.26	5070		189
SPA-3	J1PW22	11/13/12	7170		256	55.1		0.513	6.84		5.13	24.2		2.56	22400		51.3	15.9		1.28	4150		192
SPA-4	J1PW23	11/13/12	4140		307	13.7		0.615	5.66	B	6.15	13.1		3.07	18700		61.5	3.80		1.54	3990		230
SPA-5	J1PW24	11/13/12	16500		277	14.5		0.553	7.11		5.53	17.2		2.77	19700		55.3	3.91		1.38	5270		208
SPA-7	J1PW26	11/13/12	4050		290	15.3		0.580	7.49		5.80	18.0		2.90	22700		58.0	5.03		1.45	4600		217
SPA-8	J1PW27	11/13/12	7330		271	17.8		0.542	11.0		5.42	17.3		2.71	25600		54.2	3.32		1.36	9030		203
SPA-9	J1PW28	11/13/12	7960		237	11.6		0.475	7.70		4.75	17.7		2.37	22700		47.5	3.87		1.19	4460		178
SPA-10	J1PW29	11/13/12	7860		257	10.7		0.515	9.07		5.15	17.3		2.57	25300		51.5	3.10		1.29	4480		193
SPA-11	J1PW30	11/13/12	6920		270	13.9		0.539	7.05		5.39	33.6		2.70	23000		53.9	14.0		1.35	4320		202
SPA-12	J1PW31	11/13/12	7770		276	8.79		0.552	8.02		5.52	23.8		2.76	23900		55.2	4.64		1.38	4640		207
Equipment Blank	J1PW33	11/13/12	43.9	B	75.8	0.296		0.152	1.52	U	1.52	0.507	B	0.758	1920		15.2	0.803		0.379	30.9	B	56.8

Attachment	1	Sheet No.	3 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Metals).

LOCATION	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium			Selenium			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
SPA-6	J1PW25	11/13/12	305		15.0	0.0294	U	0.0294	5.99	U	5.99	10.2	B	12.0	1410		1200	0.898	U	0.898	586		5.99
Duplicate of J1PW25	J1PW32	11/13/12	292		13.1	0.0274	U	0.0274	5.23	U	5.23	10.2	B	10.5	1400		1050	0.784	U	0.784	600		5.23
SPA-1	J1PW20	11/13/12	326		14.2	0.0265	U	0.0265	5.68	U	5.68	8.16	B	11.4	796	B	1140	0.852	U	0.852	375		5.68
SPA-2	J1PW21	11/13/12	335		12.6	0.0254	U	0.0254	5.03	U	5.03	10.8		10.1	1040		1010	0.755	U	0.755	325		5.03
SPA-3	J1PW22	11/13/12	306		12.8	0.0264	U	0.0264	0.736	B	5.13	13.1		10.3	1390		1030	0.799		0.769	479		5.13
SPA-4	J1PW23	11/13/12	280		15.4	0.0305	U	0.0305	6.15	U	6.15	10.6	B	12.3	1260		1230	0.922	U	0.922	792		6.15
SPA-5	J1PW24	11/13/12	334		13.8	0.0272	U	0.0272	5.53	U	5.53	13.4		11.1	1180		1110	0.830	U	0.830	394		5.53
SPA-7	J1PW26	11/13/12	345		14.5	0.0285	U	0.0285	5.80	U	5.80	12.9		11.6	1860		1160	0.870	U	0.870	453		5.80
SPA-8	J1PW27	11/13/12	342		13.6	0.0286	U	0.0286	5.42	U	5.42	54.2		10.8	912	B	1080	0.814	U	0.814	374		5.42
SPA-9	J1PW28	11/13/12	317		11.9	0.0277	U	0.0277	4.75	U	4.75	10.6		9.49	1020		949	0.712	U	0.712	393		4.75
SPA-10	J1PW29	11/13/12	335		12.9	0.0299	U	0.0299	5.15	U	5.15	10.4		10.3	891	B	1030	0.772	U	0.772	411		5.15
SPA-11	J1PW30	11/13/12	336		13.5	0.0268	U	0.0268	5.39	U	5.39	12.3		10.8	1480		1080	0.809	U	0.809	848		5.39
SPA-12	J1PW31	11/13/12	300		13.8	0.0279	U	0.0279	5.52	U	5.52	9.92	B	11.0	878	B	1100	0.827	U	0.827	532		5.52
Equipment Blank	J1PW33	11/13/12	27.5		3.79	0.0237	U	0.0237	1.52	U	1.52	3.03	U	3.03	54.9	B	303	0.227	U	0.227	159		1.52

LOCATION	HEIS Number	Sample Date	Silver			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SPA-6	J1PW25	11/13/12	0.599	U	0.599	225		150	56.3		7.48	37.4		29.9
Duplicate of J1PW25	J1PW32	11/13/12	0.523	U	0.523	242		131	49.3		6.53	37.3		26.1
SPA-1	J1PW20	11/13/12	0.568	U	0.568	393		142	69.3		7.10	50.7		28.4
SPA-2	J1PW21	11/13/12	0.503	U	0.503	503		126	65.8		6.29	47.4		25.2
SPA-3	J1PW22	11/13/12	0.513	U	0.513	308		128	49.9		6.41	63.7		25.6
SPA-4	J1PW23	11/13/12	0.615	U	0.615	219		154	48.8		7.68	34.7		30.7
SPA-5	J1PW24	11/13/12	0.553	U	0.553	345		138	52.2		6.92	42.4		27.7
SPA-7	J1PW26	11/13/12	0.580	U	0.580	247		145	53.0		7.25	41.9		29.0
SPA-8	J1PW27	11/13/12	0.542	U	0.542	463		136	62.9		6.78	46.5		27.1
SPA-9	J1PW28	11/13/12	0.475	U	0.475	359		119	60.3		5.93	45.3		23.7
SPA-10	J1PW29	11/13/12	0.515	U	0.515	356		129	63.4		6.43	45.3		25.7
SPA-11	J1PW30	11/13/12	0.539	U	0.539	328		135	58.9		6.74	51.9		27.0
SPA-12	J1PW31	11/13/12	0.552	U	0.552	330		138	61.9		6.89	52.9		27.6
Equipment Blank	J1PW33	11/13/12	0.152	U	0.152	7.88	B	37.9	1.04	B	1.89	3.18	B	7.58

Attachment	1	Sheet No.	4 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (TPH & Physical).

Location	HEIS Number	Sample Date	TPH - Diesel			TPH Diesel EXT			Percent moisture (wet sample)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	%	Q	PQL
EXC-6	J1PW11	7/25/12	12000		670	18000		990	0.97		0.10
Replicate of J1PW11	J1PW19	7/25/12	5100		680	7600		1000	1.1		0.10
EXC-1	J1PW06	7/25/12	1700	J	660	1800	J	970	1.0		0.10
EXC-2	J1PW07	7/25/12	840	J	680	1000	U	1000	0.74		0.10
EXC-3	J1PW08	7/25/12	680	U	680	1000	U	1000	1.2		0.10
EXC-4	J1PW09	7/25/12	640	U	640	940	U	940	2.1		0.10
EXC-5	J1PW10	7/25/12	650	U	650	950	U	950	1.9		0.10
EXC-7	J1PW12	7/25/12	690	J	660	1200	J	970	1.0		0.10
EXC-8	J1PW13	7/25/12	1200	J	650	1200	J	950	1.4		0.10
EXC-9	J1PW14	7/25/12	88000		650	120000		950	0.85		0.10
EXC-10	J1PW15	7/25/12	7200		680	11000		1000	0.92		0.10
EXC-11	J1PW16	7/25/12	990	J	680	1700	J	990	0.98		0.10
EXC-12	J1PW17	7/25/12	2100	J	680	2400	J	990	0.66		0.10
EXC-13	J1PW18	7/25/12	2700	J	660	4800		960	1.2		0.10
FS-1	J1PW34	7/25/12	2500	JB	620	2900	JB	910	0.61		0.10
FS-2	J1PW35	7/25/12	5300	B	640	6400	B	950	0.97		0.10
FS-3	J1PW36	7/25/12	2100	JB	640	2700	JB	940	0.76		0.10
FS-4	J1PW37	7/25/12	28000	B	650	43000	B	950	0.66		0.10

LOCATION	HEIS Number	Sample Date	TPH - Diesel Range			TPH - Motor Oil			Percent moisture (wet sample)			Percent Solids		
			ug/kg	Q	PQL	ug/kg	Q	PQL	%	Q	PQL	%	Q	PQL
SPA-6	J1PW25	11/13/12	3520	U	3520	10600	U	10600	7.2		0.1	92.8		0.1
Duplicate of J1PW25	J1PW32	11/13/12	3570	U	3570	10700	U	10700	8.9		0.1	91.1		0.1
SPA-1	J1PW20	11/13/12	3400	U	3400	10200	U	10200	5.7		0.1	94.3		0.1
SPA-2	J1PW21	11/13/12	3570	U	3570	10700	U	10700	6.9		0.1	93.1		0.1
SPA-3	J1PW22	11/13/12	3590	U	3590	7420	J	10800	12.7		0.1	87.3		0.1
SPA-4	J1PW23	11/13/12	3490	U	3490	10500	U	10500	7.9		0.1	92.1		0.1
SPA-5	J1PW24	11/13/12	3430	U	3430	10300	U	10300	8.1		0.1	91.9		0.1
SPA-7	J1PW26	11/13/12	3680	U	3680	11000	U	11000	12.3		0.1	87.7		0.1
SPA-8	J1PW27	11/13/12	3370	U	3370	10100	U	10100	4.6		0.1	95.4		0.1
SPA-9	J1PW28	11/13/12	3580	U	3580	10700	U	10700	7.1		0.1	92.9		0.1
SPA-10	J1PW29	11/13/12	3560	U	3560	10700	U	10700	8.9		0.1	91.1		0.1
SPA-11	J1PW30	11/13/12	3770	U	3770	25400		11300	11.7		0.1	88.3		0.1
SPA-12	J1PW31	11/13/12	3590	U	3590	5700	J	10800	7.8		0.1	92.2		0.1
Equipment Blank	J1PW33	11/13/12										99.9		0.1
Trip Blank	J1R5M1	11/13/12							0.1	U	0.1	100		0.1

Attachment	1	Sheet No.	5 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	EXC-6 - J1PW11			Duplicate of J1PW11 - J1PW19			EXC-1 - J1PW06			EXC-2 - J1PW07			EXC-3 - J1PW08		
		7/25/12			7/25/12			7/25/12			7/25/12			7/25/12		
		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	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Aroclor-1221	PCB	8.1	U	8.1	8.0	U	8.0	7.7	U	7.7	7.9	U	7.9	7.7	U	7.7
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0	1.9	U	1.9
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
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
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
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
Acenaphthene	PAH	10	U	10	9.9	U	9.9	9.9	U	9.9	10	U	10	9.8	U	9.8
Acenaphthylene	PAH	9.0	U	9.0	8.9	U	8.9	8.9	U	8.9	9.0	U	9.0	8.8	U	8.8
Anthracene	PAH	15	J	3.1	10	J	3.0	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0
Benzo(a)anthracene	PAH	48	X	3.2	15	X	3.2	3.1	U	3.1	3.2	U	3.2	3.1	U	3.1
Benzo(a)pyrene	PAH	93		6.4	32		6.4	6.3	U	6.3	6.4	U	6.4	6.3	U	6.3
Benzo(b)fluoranthene	PAH	94		4.2	40		4.2	4.1	U	4.1	4.2	U	4.2	4.1	U	4.1
Benzo(ghi)perylene	PAH	75		7.2	17	JX	7.1	7.1	U	7.1	7.2	U	7.2	7.1	U	7.1
Benzo(k)fluoranthene	PAH	39		4.0	15		3.9	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9
Chrysene	PAH	84		4.9	34	J	4.8	4.8	U	4.8	4.8	U	4.8	4.7	U	4.7
Dibenz[a,h]anthracene	PAH	19	JX	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	110		13	62		13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.3	U	5.3	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	PAH	70		12	32		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
Phenanthrene	PAH	46		12	29	J	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	140		12	67		12	12	U	12	12	U	12	12	U	12
1,1,1-Trichloroethane	VOA	0.64	U	0.64	0.79	U	0.79	0.56	UX	0.56	0.65	U	0.65	0.67	U	0.67
1,1,2,2-Tetrachloroethane	VOA	0.75	UJ	0.75	0.92	UJ	0.92	0.65	UJX	0.65	0.76	UJ	0.76	0.79	UJ	0.79
1,1,2-Trichloroethane	VOA	1.1	UJ	1.1	1.3	UJ	1.3	0.94	UJ	0.94	1.1	UJ	1.1	1.1	UJ	1.1
1,1-Dichloroethane	VOA	0.26	U	0.26	0.32	U	0.32	0.23	UX	0.23	0.26	U	0.26	0.27	U	0.27
1,1-Dichloroethene	VOA	0.72	U	0.72	0.89	U	0.89	0.63	U	0.63	0.73	U	0.73	0.77	U	0.77
1,2-Dichloroethane	VOA	0.86	UJ	0.86	1.1	UJ	1.1	0.75	UJ	0.75	0.87	UJ	0.87	0.91	UJ	0.91
1,2-Dichloroethene(Total)	VOA	0.48	U	0.48	0.59	U	0.59	0.42	UX	0.42	0.49	U	0.49	0.51	U	0.51
1,2-Dichloropropane	VOA	0.67	UJ	0.67	0.83	UJ	0.83	0.59	UJX	0.59	0.68	UJ	0.68	0.71	UJ	0.71
2-Butanone	VOA	2.2	UJ	2.2	2.8	UJ	2.8	2.0	UJ	2.0	2.3	UJ	2.3	2.4	UJ	2.4
2-Hexanone	VOA	6.0	U	6.0	7.4	U	7.4	5.2	UX	5.2	6.1	U	6.1	6.3	U	6.3
4-Methyl-2-Pentanone	VOA	5.3	UJ	5.3	6.6	UJ	6.6	4.7	UJ	4.7	5.4	UJ	5.4	5.7	UJ	5.7
Acetone	VOA	9.5	J	6.6	8.2	UJ	8.2	9.4	J	5.8	8.7	J	6.7	7.7	J	7.0
Benzene	VOA	0.58	UJ	0.58	0.71	UJ	0.71	0.50	UJ	0.50	0.59	UJ	0.59	0.61	UJ	0.61
Bromodichloromethane	VOA	0.27	UJ	0.27	0.33	UJ	0.33	0.24	UJ	0.24	0.27	UJ	0.27	0.29	UJ	0.29
Bromoform	VOA	0.28	U	0.28	0.35	U	0.35	0.25	U	0.25	0.29	U	0.29	0.30	U	0.30
Bromomethane	VOA	0.61	UJ	0.61	0.76	UJ	0.76	0.54	UJX	0.54	0.62	UJ	0.62	0.65	UJ	0.65
Carbon disulfide	VOA	0.52	UJ	0.52	0.64	UJ	0.64	0.45	UJX	0.45	0.52	UJ	0.52	0.54	UJ	0.54
Carbon tetrachloride	VOA	0.77	U	0.77	0.95	U	0.95	0.68	UX	0.68	0.78	U	0.78	0.82	U	0.82
Chlorobenzene	VOA	0.66	U	0.66	0.82	U	0.82	0.58	U	0.58	0.67	U	0.67	0.70	U	0.70
Chloroethane	VOA	1.1	U	1.1	1.3	U	1.3	0.95	U	0.95	1.1	U	1.1	1.2	U	1.2
Chloroform	VOA	0.36	U	0.36	0.44	U	0.44	0.31	U	0.31	0.36	U	0.36	0.38	U	0.38
Chloromethane	VOA	0.94	U	0.94	1.2	U	1.2	0.83	U	0.83	0.96	U	0.96	1.0	U	1.0
cis-1,3-Dichloropropene	VOA	1.6	U	1.6	2.0	U	2.0	1.4	UX	1.4	1.6	U	1.6	1.7	U	1.7
Dibromochloromethane	VOA	0.70	U	0.70	0.86	U	0.86	0.61	U	0.61	0.71	U	0.71	0.74	U	0.74
Ethylbenzene	VOA	0.82	U	0.82	1.0	U	1.0	0.72	UX	0.72	0.83	U	0.83	0.87	U	0.87
Methylenechloride	VOA	2.0	U	2.0	4.7	J	2.4	7.1	X	1.7	12		2.0	2.1	U	2.1
Styrene	VOA	0.77	UJ	0.77	0.95	UJ	0.95	0.68	UJX	0.68	1.2	J	0.78	0.82	UJ	0.82
Tetrachloroethene	VOA	0.72	U	0.72	0.89	U	0.89	0.63	U	0.63	0.73	U	0.73	0.77	U	0.77
Toluene	VOA	0.85	U	0.85	1.0	U	1.0	0.74	U	0.74	0.86	U	0.86	0.90	U	0.90
trans-1,3-Dichloropropene	VOA	0.82	U	0.82	1.0	U	1.0	0.72	U	0.72	0.83	U	0.83	0.87	U	0.87
Trichloroethene	VOA	0.28	U	0.28	0.35	U	0.35	0.25	U	0.25	0.29	U	0.29	0.30	U	0.30
Vinyl chloride	VOA	1.6	UJ	1.6	2.0	UJ	2.0	1.4	UJ	1.4	1.7	UJ	1.7	1.7	UJ	1.7
Xylenes (total)	VOA	0.75	U	0.75	0.92	U	0.92	0.65	UX	0.65	0.76	U	0.76	0.79	U	0.79

Attachment	1	Sheet No.	6 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Wastes Site Verification Sample Results (Organics).

LOCATION	CLASS	EXC-4 - J1PW09			EXC-5 - J1PW10			EXC-7 - J1PW12			EXC-8 - J1PW13			EXC-9 - J1PW14 [a]		
		7/25/12			7/25/12			7/25/12			7/25/12			7/25/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.7	U	2.7	2.7	U	2.7	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7
Aroclor-1221	PCB	7.9	U	7.9	7.8	U	7.8	8.0	U	8.0	7.4	U	7.4	7.9	U	7.9
Aroclor-1232	PCB	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0	1.8	U	1.8	2.0	U	2.0
Aroclor-1242	PCB	4.6	U	4.6	4.5	U	4.5	4.7	U	4.7	4.3	U	4.3	4.6	U	4.6
Aroclor-1248	PCB	4.6	U	4.6	4.5	U	4.5	4.7	U	4.7	4.3	U	4.3	4.6	U	4.6
Aroclor-1254	PCB	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.4	U	2.4	16	J	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.4	U	2.4	10	JP	2.6
Acenaphthene	PAH	10	U	10	9.9	U	9.9	9.9	U	9.9	9.9	U	9.9	1000	X	9.9
Acenaphthylene	PAH	9.1	U	9.1	8.9	U	8.9	8.9	U	8.9	8.9	U	8.9	8.9	U	8.9
Anthracene	PAH	3.1	U	3.1	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	1100	J	3.0
Benzo(a)anthracene	PAH	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.2	U	3.2	2700	J	3.2
Benzo(a)pyrene	PAH	6.5	U	6.5	6.4	U	6.4	6.3	U	6.3	6.4	U	6.4	3100	J	6.3
Benzo(b)fluoranthene	PAH	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.2	U	4.2	2500	J	4.2
Benzo(ghi)perylene	PAH	7.3	U	7.3	7.1	U	7.1	7.1	U	7.1	7.2	U	7.2	1800	J	7.1
Benzo(k)fluoranthene	PAH	4.0	U	4.0	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	1600	J	3.9
Chrysene	PAH	4.9	U	4.9	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	3300	J	4.8
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	470	JX	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13	5700	J	13
Fluorene	PAH	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2	760	J	5.2
Indeno(1,2,3-cd)pyrene	PAH	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
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	4700	J	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	6200	J	12
1,1,1-Trichloroethane	VOA	0.69	U	0.69	0.57	U	0.57	0.49	U	0.49	0.55	U	0.55	0.46	U	0.46
1,1,2,2-Tetrachloroethane	VOA	0.82	UJ	0.82	0.67	UJ	0.67	0.58	UJ	0.58	0.65	UJ	0.65	0.54	UJ	0.54
1,1,2-Trichloroethane	VOA	1.2	UJ	1.2	0.97	UJ	0.97	0.83	UJ	0.83	0.93	UJ	0.93	0.77	UJ	0.77
1,1-Dichloroethane	VOA	0.28	U	0.28	0.23	U	0.23	0.20	U	0.20	0.22	U	0.22	0.18	U	0.18
1,1-Dichloroethene	VOA	0.79	U	0.79	0.65	U	0.65	0.56	U	0.56	0.62	U	0.62	0.52	U	0.52
1,2-Dichloroethane	VOA	0.94	UJ	0.94	0.77	UJ	0.77	0.66	UJ	0.66	0.74	UJ	0.74	0.61	UJ	0.61
1,2-Dichloroethene(Total)	VOA	0.52	U	0.52	0.43	U	0.43	0.37	U	0.37	0.41	U	0.41	0.34	U	0.34
1,2-Dichloropropane	VOA	0.73	UJ	0.73	0.60	UJ	0.60	0.52	UJ	0.52	0.58	UJ	0.58	0.48	UJ	0.48
2-Butanone	VOA	2.4	UJ	2.4	2.0	UJ	2.0	1.7	UJ	1.7	1.9	UJ	1.9	1.6	UJ	1.6
2-Hexanone	VOA	6.5	U	6.5	5.4	U	5.4	4.6	U	4.6	5.2	U	5.2	4.3	U	4.3
4-Methyl-2-Pentanone	VOA	5.8	UJ	5.8	4.8	UJ	4.8	4.1	UJ	4.1	4.6	UJ	4.6	3.8	UJ	3.8
Acetone	VOA	7.2	UJ	7.2	5.9	UJ	5.9	9.2	J	5.1	6.5	J	5.7	6.8	J	4.7
Benzene	VOA	0.63	UJ	0.63	0.52	UJ	0.52	0.44	UJ	0.44	0.50	UJ	0.50	0.41	UJ	0.41
Bromodichloromethane	VOA	0.29	UJ	0.29	0.24	UJ	0.24	0.21	UJ	0.21	0.23	UJ	0.23	0.19	UJ	0.19
Bromoform	VOA	0.31	U	0.31	0.25	U	0.25	0.22	U	0.22	0.24	U	0.24	0.20	U	0.20
Bromomethane	VOA	0.67	UJ	0.67	0.55	UJ	0.55	0.47	UJ	0.47	0.53	UJ	0.53	0.44	UJ	0.44
Carbon disulfide	VOA	0.56	UJ	0.56	0.46	UJ	0.46	0.40	UJ	0.40	0.44	UJ	0.44	0.37	UJ	0.37
Carbon tetrachloride	VOA	0.84	U	0.84	0.69	U	0.69	0.60	U	0.60	0.67	U	0.67	0.55	U	0.55
Chlorobenzene	VOA	0.72	U	0.72	0.59	U	0.59	0.51	U	0.51	0.57	U	0.57	0.47	U	0.47
Chloroethane	VOA	1.2	U	1.2	0.98	U	0.98	0.84	U	0.84	0.94	U	0.94	0.78	U	0.78
Chloroform	VOA	0.39	U	0.39	0.32	U	0.32	0.27	U	0.27	0.31	U	0.31	0.25	U	0.25
Chloromethane	VOA	1.0	U	1.0	0.85	U	0.85	0.73	U	0.73	0.82	U	0.82	0.68	U	0.68
cis-1,3-Dichloropropene	VOA	1.7	U	1.7	1.4	U	1.4	1.2	U	1.2	1.4	U	1.4	1.1	U	1.1
Dibromochloromethane	VOA	0.76	U	0.76	0.63	U	0.63	0.54	U	0.54	0.60	U	0.60	0.50	U	0.50
Ethylbenzene	VOA	0.90	U	0.90	0.74	U	0.74	0.63	U	0.63	0.71	U	0.71	0.59	U	0.59
Methylenechloride	VOA	3.3	J	2.1	6.5		1.8	1.5	J	1.5	6.2		1.7	3.6	J	1.4
Styrene	VOA	0.84	UJ	0.84	0.69	UJ	0.69	0.60	UJ	0.60	0.67	UJ	0.67	0.55	UJ	0.55
Tetrachloroethene	VOA	0.79	U	0.79	0.65	U	0.65	0.56	U	0.56	0.62	U	0.62	0.52	U	0.52
Toluene	VOA	0.92	U	0.92	0.76	U	0.76	0.65	U	0.65	0.73	U	0.73	0.61	U	0.61
trans-1,3-Dichloropropene	VOA	0.90	U	0.90	0.74	U	0.74	0.63	U	0.63	0.71	U	0.71	0.59	U	0.59
Trichloroethene	VOA	0.31	U	0.31	0.25	U	0.25	0.22	U	0.22	0.24	U	0.24	0.20	U	0.20
Vinyl chloride	VOA	1.8	UJ	1.8	1.5	UJ	1.5	1.3	UJ	1.3	1.4	UJ	1.4	1.2	UJ	1.2
Xylenes (total)	VOA	0.82	U	0.82	0.67	U	0.67	0.58	U	0.58	0.65	U	0.65	0.54	U	0.54

Attachment	1	Sheet No.	7 of 20
Originator	J. D. Skoglie	Date	2/5/13
Checked	N. K. Schiffern	Date	2/5/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	Re-sample EXC-9 - J1R505			EXC-10 - J1PW15			EXC-11 - J1PW16			EXC-12 - J1PW17			EXC-13 - J1PW18		
		10/31/12			7/25/12			7/25/12			7/25/12			7/25/12		
		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	2.7	U	2.7	2.7	U	2.7	2.8	U	2.8
Aroclor-1221	PCB				8.0	U	8.0	7.9	U	7.9	7.8	U	7.8	8.0	U	8.0
Aroclor-1232	PCB				2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0
Aroclor-1242	PCB				4.6	U	4.6	4.6	U	4.6	4.6	U	4.6	4.6	U	4.6
Aroclor-1248	PCB				4.6	U	4.6	4.6	U	4.6	4.6	U	4.6	4.6	U	4.6
Aroclor-1254	PCB				2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aroclor-1260	PCB				52		2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Acenaphthene	PAH	3.57	U	3.57	10	U	10	10	U	10	9.9	U	9.9	9.9	U	9.9
Acenaphthylene	PAH	3.57	U	3.57	9.0	U	9.0	9.1	U	9.1	8.9	U	8.9	8.9	U	8.9
Anthracene	PAH	1.11	J	3.57	13	J	3.0	3.1	U	3.1	3.0	U	3.0	3.0	J	3.0
Benzo(a)anthracene	PAH	2.32	J	3.57	54		3.2	3.2	U	3.2	3.2	U	3.2	7.8	JX	3.2
Benzo(a)pyrene	PAH	30.9		3.57	59		6.4	6.5	U	6.5	6.3	U	6.3	22		6.3
Benzo(b)fluoranthene	PAH	14.4		3.57	65		4.2	4.2	U	4.2	4.2	U	4.2	22		4.2
Benzo(ghi)perylene	PAH	21.6		3.57	44	X	7.2	7.2	U	7.2	7.1	U	7.1	11	JX	7.1
Benzo(k)fluoranthene	PAH	8.79		3.57	27		3.9	4.0	U	4.0	3.9	U	3.9	20		3.9
Chrysene	PAH	17.2		3.57	65		4.8	4.9	U	4.9	4.8	U	4.8	23	J	4.8
Dibenz[a,h]anthracene	PAH	2.32		3.57	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	28.4		3.57	99	X	13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	3.57	U	3.57	9.4	J	5.3	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	PAH	21.5		3.57	52		12	12	U	12	12	U	12	24	J	12
Naphthalene	PAH	6.11		3.57	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	14.6		3.57	36	J	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	21.4		3.57	110		12	12	U	12	12	U	12	12	U	12
1,1,1-Trichloroethane	VOA				0.51	U	0.51	0.60	U	0.60	0.61	U	0.61	0.62	U	0.62
1,1,2,2-Tetrachloroethane	VOA				0.59	UJ	0.59	0.71	UJ	0.71	0.72	UJ	0.72	0.72	UJ	0.72
1,1,2-Trichloroethane	VOA				0.86	UJ	0.86	1.0	UJ	1.0	1.0	UJ	1.0	1.0	UJ	1.0
1,1-Dichloroethane	VOA				0.20	U	0.20	0.24	U	0.24	0.25	U	0.25	0.25	U	0.25
1,1-Dichloroethene	VOA				0.58	U	0.58	0.69	U	0.69	0.70	U	0.70	0.70	U	0.70
1,2-Dichloroethane	VOA				0.68	UJ	0.68	0.81	UJ	0.81	0.83	UJ	0.83	0.83	UJ	0.83
1,2-Dichloroethene(Total)	VOA				0.38	U	0.38	0.45	U	0.45	0.46	U	0.46	0.46	U	0.46
1,2-Dichloropropane	VOA				0.54	UJ	0.54	0.64	UJ	0.64	0.65	UJ	0.65	0.65	UJ	0.65
2-Butanone	VOA				1.8	UJ	1.8	2.1	UJ	2.1	2.2	UJ	2.2	2.2	UJ	2.2
2-Hexanone	VOA				4.8	U	4.8	5.7	U	5.7	5.8	U	5.8	5.8	U	5.8
4-Methyl-2-Pentanone	VOA				4.3	UJ	4.3	5.1	UJ	5.1	5.1	UJ	5.1	5.2	UJ	5.2
Acetone	VOA				7.9	J	5.2	13	J	6.2	8.0	J	6.3	6.4	UJ	6.4
Benzene	VOA				0.46	UJ	0.46	0.55	UJ	0.55	0.55	UJ	0.55	0.56	UJ	0.56
Bromodichloromethane	VOA				0.21	UJ	0.21	0.26	UJ	0.26	0.26	UJ	0.26	0.26	UJ	0.26
Bromoform	VOA				0.22	U	0.22	0.27	U	0.27	0.27	U	0.27	0.27	U	0.27
Bromomethane	VOA				0.49	UJ	0.49	0.58	UJ	0.58	0.59	UJ	0.59	0.59	UJ	0.59
Carbon disulfide	VOA				0.41	UJ	0.41	0.49	UJ	0.49	0.50	UJ	0.50	0.50	UJ	0.50
Carbon tetrachloride	VOA				0.61	U	0.61	0.73	U	0.73	0.74	U	0.74	0.75	U	0.75
Chlorobenzene	VOA				0.53	U	0.53	0.63	U	0.63	0.64	U	0.64	0.64	U	0.64
Chloroethane	VOA				0.87	U	0.87	1.0	U	1.0	1.0	U	1.0	1.1	U	1.1
Chloroform	VOA				0.28	U	0.28	0.34	U	0.34	0.34	U	0.34	0.34	U	0.34
Chloromethane	VOA				0.75	U	0.75	0.89	U	0.89	0.91	U	0.91	0.91	U	0.91
cis-1,3-Dichloropropene	VOA				1.3	U	1.3	1.5	U	1.5	1.5	U	1.5	1.5	U	1.5
Dibromochloromethane	VOA				0.56	U	0.56	0.66	U	0.66	0.67	U	0.67	0.68	U	0.68
Ethylbenzene	VOA				0.65	U	0.65	0.78	U	0.78	0.79	U	0.79	0.80	U	0.80
Methylenechloride	VOA				5.6		1.6	12		1.9	8.6		1.9	1.9	U	1.9
Styrene	VOA				0.61	UJ	0.61	0.73	UJ	0.73	0.74	UJ	0.74	0.75	UJ	0.75
Tetrachloroethene	VOA				0.58	U	0.58	0.69	U	0.69	0.70	U	0.70	0.70	U	0.70
Toluene	VOA				0.67	U	0.67	0.80	U	0.80	0.81	U	0.81	0.82	U	0.82
trans-1,3-Dichloropropene	VOA				0.65	U	0.65	0.78	U	0.78	0.79	U	0.79	0.80	U	0.80
Trichloroethene	VOA				0.22	U	0.22	0.27	U	0.27	0.27	U	0.27	0.27	U	0.27
Vinyl chloride	VOA				1.3	UJ	1.3	1.6	UJ	1.6	1.6	UJ	1.6	1.6	UJ	1.6
Xylenes (total)	VOA				0.59	U	0.59	0.71	U	0.71	0.72	U	0.72	0.72	U	0.72

Attachment	1	Sheet No.	8 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	FS-1 - J1PW34			FS-2 - J1PW35			FS-3 - J1PW36			FS-4 - J1PW37 a			Re-sample FS-4 - J1R507		
		7/25/12			7/25/12			7/25/12			7/25/12			10/31/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7			
Aroclor-1221	PCB	7.8	U	7.8	7.6	U	7.6	7.9	U	7.9	7.7	U	7.7			
Aroclor-1232	PCB	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0	1.9	U	1.9			
Aroclor-1242	PCB	4.6	U	4.6	4.4	U	4.4	4.6	U	4.6	4.5	U	4.5			
Aroclor-1248	PCB	4.6	U	4.6	4.4	U	4.4	4.6	U	4.6	4.5	U	4.5			
Aroclor-1254	PCB	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6	7.7	JP	2.5			
Aroclor-1260	PCB	2.5	U	2.5	44		2.5	2.6	U	2.6	9.6		2.5			
Acenaphthene	PAH	9.6	U	9.6	10	U	10	9.7	U	9.7	180	X	10	3.48	U	3.48
Acenaphthylene	PAH	8.7	U	8.7	9.1	U	9.1	8.7	U	8.7	9.0	U	9.0	3.48	U	3.48
Anthracene	PAH	2.9	U	2.9	3.1	U	3.1	2.9	U	2.9	200		3.1	3.48	U	3.48
Benzo(a)anthracene	PAH	3.1	U	3.1	3.2	U	3.2	3.1	U	3.1	940		3.2	3.48	U	3.48
Benzo(a)pyrene	PAH	6.2	U	6.2	11	J	6.5	6.2	U	6.2	1000		6.4	3.48	U	3.48
Benzo(b)fluoranthene	PAH	4.0	U	4.0	9.6	J	4.2	4.1	U	4.1	890		4.2	3.48	U	3.48
Benzo(ghi)perylene	PAH	6.9	U	6.9	7.2	U	7.2	7.0	U	7.0	620		7.2	3.48	U	3.48
Benzo(k)fluoranthene	PAH	3.8	U	3.8	4.0	U	4.0	3.8	U	3.8	560		4.0	3.48	U	3.48
Chrysene	PAH	4.7	U	4.7	8.3	J	4.9	4.7	U	4.7	1100		4.9	1.51	J	3.48
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	180	X	11	3.48	U	3.48
Fluoranthene	PAH	12	U	12	13	J	13	13	U	13	1400	X	13	3.48	U	3.48
Fluorene	PAH	5.1	U	5.1	5.3	U	5.3	5.1	U	5.1	130	X	5.3	3.48	U	3.48
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	580		12	3.48	U	3.48
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	3.48	U	3.48
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	560		12	3.48	U	3.48
Pyrene	PAH	12	U	12	15	J	12	12	U	12	1700		12	3.48	U	3.48
1,1,1-Trichloroethane	VOA	0.64	U	0.64	0.64	U	0.64	1.0	U	1.0	0.56	U	0.56			
1,1,2,2-Tetrachloroethane	VOA	0.75	U	0.75	0.75	U	0.75	1.2	U	1.2	0.66	U	0.66			
1,1,2-Trichloroethane	VOA	1.1	U	1.1	1.1	U	1.1	1.7	U	1.7	0.95	U	0.95			
1,1-Dichloroethane	VOA	0.26	U	0.26	0.26	U	0.26	0.41	U	0.41	0.23	U	0.23			
1,1-Dichloroethene	VOA	0.73	U	0.73	0.75	J	0.73	1.1	U	1.1	0.67	J	0.64			
1,2-Dichloroethane	VOA	0.86	U	0.86	0.86	U	0.86	1.4	U	1.4	0.76	U	0.76			
1,2-Dichloroethene(Total)	VOA	0.48	U	0.48	0.48	U	0.48	0.76	U	0.76	0.42	U	0.42			
1,2-Dichloropropane	VOA	0.68	U	0.68	0.68	U	0.68	1.1	U	1.1	0.60	U	0.60			
2-Butanone	VOA	2.3	U	2.3	2.2	U	2.2	3.6	U	3.6	2.0	U	2.0			
2-Hexanone	VOA	6.0	U	6.0	6.0	U	6.0	9.5	U	9.5	5.3	U	5.3			
4-Methyl-2-Pentanone	VOA	5.4	U	5.4	5.4	U	5.4	8.5	U	8.5	4.7	U	4.7			
Acetone	VOA	6.6	U	6.6	6.8	J	6.6	10	U	10	7.3	J	5.8			
Benzene	VOA	0.58	U	0.58	0.58	U	0.58	0.91	U	0.91	0.51	U	0.51			
Bromodichloromethane	VOA	0.27	U	0.27	0.27	U	0.27	0.43	U	0.43	0.24	U	0.24			
Bromoform	VOA	0.28	U	0.28	0.28	U	0.28	0.45	U	0.45	0.25	U	0.25			
Bromomethane	VOA	0.62	U	0.62	0.61	U	0.61	0.97	U	0.97	0.54	U	0.54			
Carbon disulfide	VOA	0.52	U	0.52	0.52	U	0.52	0.82	U	0.82	0.45	U	0.45			
Carbon tetrachloride	VOA	0.78	U	0.78	0.77	U	0.77	1.2	U	1.2	0.68	U	0.68			
Chlorobenzene	VOA	0.67	U	0.67	0.66	U	0.66	1.0	U	1.0	0.58	U	0.58			
Chloroethane	VOA	1.1	U	1.1	1.1	U	1.1	1.7	U	1.7	0.96	U	0.96			
Chloroform	VOA	0.36	U	0.36	0.36	U	0.36	0.56	U	0.56	0.31	U	0.31			
Chloromethane	VOA	0.95	U	0.95	0.95	U	0.95	1.5	U	1.5	0.83	U	0.83			
cis-1,3-Dichloropropene	VOA	1.6	U	1.6	1.6	U	1.6	2.5	U	2.5	1.4	U	1.4			
Dibromochloromethane	VOA	0.70	U	0.70	0.70	U	0.70	1.1	U	1.1	0.62	U	0.62			
Ethylbenzene	VOA	0.83	U	0.83	0.82	U	0.82	1.3	U	1.3	0.73	U	0.73			
Methylenechloride	VOA	3.0	JB	2.0	7.9	B	2.0	18	B	3.1	5.8	B	1.7			
Styrene	VOA	0.78	U	0.78	0.77	U	0.77	1.2	U	1.2	1.2	J	0.68			
Tetrachloroethene	VOA	0.73	U	0.73	0.73	U	0.73	1.1	U	1.1	0.64	U	0.64			
Toluene	VOA	0.85	U	0.85	0.85	U	0.85	1.3	U	1.3	0.75	U	0.75			
trans-1,3-Dichloropropene	VOA	0.83	U	0.83	0.82	U	0.82	1.3	U	1.3	0.73	U	0.73			
Trichloroethene	VOA	0.28	U	0.28	0.28	U	0.28	0.45	U	0.45	0.25	U	0.25			
Vinyl chloride	VOA	1.7	U	1.7	1.6	U	1.6	2.6	U	2.6	1.5	U	1.5			
Xylenes (total)	VOA	0.75	U	0.75	0.75	U	0.75	1.2	U	1.2	0.66	U	0.66			

Attachment	1	Sheet No.	9 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	EXC-6 - J1PW11			Duplicate of J1PW11 - J1PW19			EXC-1 - J1PW06			EXC-2 - J1PW07			EXC-3 - J1PW08		
		7/25/12			7/25/12			7/25/12			7/25/12			7/25/12		
		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	27	U	27	27	U	27	28	U	28	28	U	28	27	U	27
1,2-Dichlorobenzene	SVOA	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	9.6	U	9.6	9.8	U	9.8	9.9	U	9.9	9.6	U	9.6
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	9.6	U	9.6	9.8	U	9.8	9.9	U	9.9	9.6	U	9.6
2,4-Dichlorophenol	SVOA	9.7	U	9.7	9.6	U	9.6	9.8	U	9.8	9.9	U	9.9	9.6	U	9.6
2,4-Dimethylphenol	SVOA	64	U	64	64	U	64	65	U	65	65	U	65	63	U	63
2,4-Dinitrophenol	SVOA	320	UJ	320	320	UJ	320	330	UJ	330	330	UJ	330	320	UJ	320
2,4-Dinitrotoluene	SVOA	64	U	64	64	U	64	65	U	65	65	U	65	63	U	63
2,6-Dinitrotoluene	SVOA	27	U	27	27	U	27	28	U	28	28	U	28	27	U	27
2-Chloronaphthalene	SVOA	9.7	U	9.7	9.6	U	9.6	9.8	U	9.8	9.9	U	9.9	9.6	U	9.6
2-Chlorophenol	SVOA	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20
2-Methylnaphthalene	SVOA	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	12	U	12
2-Nitroaniline	SVOA	49	U	49	48	U	48	49	U	49	49	U	49	48	U	48
2-Nitrophenol	SVOA	9.7	U	9.7	9.6	U	9.6	9.8	U	9.8	9.9	U	9.9	9.6	U	9.6
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	32	U	32	33	U	33	32	U	32
3,3'-Dichlorobenzidine	SVOA	87	UJ	87	87	UJ	87	89	UJ	89	89	UJ	89	86	UJ	86
3-Nitroaniline	SVOA	71	U	71	70	U	70	72	U	72	72	U	72	70	U	70
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	320	U	320	330	U	330	320	U	320
4-Bromophenylphenyl ether	SVOA	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18
4-Chloro-3-methylphenol	SVOA	64	U	64	64	U	64	65	U	65	65	U	65	63	U	63
4-Chloroaniline	SVOA	80	UJ	80	79	UJ	79	81	UJ	81	81	UJ	81	79	UJ	79
4-Chlorophenylphenyl ether	SVOA	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20
4-Nitroaniline	SVOA	70	U	70	70	U	70	71	U	71	72	U	72	70	U	70
4-Nitrophenol	SVOA	94	U	94	93	U	93	95	U	95	96	U	96	93	U	93
Acenaphthene	SVOA	10	U	10	9.9	U	9.9	10	U	10	10	U	10	9.9	U	9.9
Acenaphthylene	SVOA	17	U	17	16	U	16	17	U	17	17	U	17	16	U	16
Anthracene	SVOA	17	U	17	16	U	16	17	U	17	17	U	17	16	U	16
Benzo(a)anthracene	SVOA	65	J	19	24	J	19	20	U	20	20	U	20	19	U	19
Benzo(a)pyrene	SVOA	92	J	19	26	J	19	20	U	20	20	U	20	19	U	19
Benzo(b)fluoranthene	SVOA	150	JX	25	42	JX	25	26	U	26	26	U	26	25	U	25
Benzo(ghi)perylene	SVOA	71	J	16	20	J	15	16	U	16	16	U	16	15	U	15
Benzo(k)fluoranthene	SVOA	39	UX	39	39	UX	39	39	U	39	40	U	40	38	U	38
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	660	U	45	660	U	44	660	U	45	660	U	45	660	U	44
Butylbenzylphthalate	SVOA	42	U	42	41	U	41	42	U	42	42	U	42	41	U	41
Carbazole	SVOA	35	U	35	35	U	35	35	U	35	36	U	36	35	U	35
Chrysene	SVOA	94	J	26	27	J	26	27	U	27	27	U	27	26	U	26
Di-n-butylphthalate	SVOA	28	U	28	28	U	28	29	U	29	29	U	29	28	U	28
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	76	J	14	14	U	14	14	U	14
Dibenz[a,h]anthracene	SVOA	18	U	18	18	U	18	19	U	19	19	U	19	18	U	18
Dibenzofuran	SVOA	19	U	19	19	U	19	20	U	20	20	U	20	19	U	19
Diethyl phthalate	SVOA	25	U	25	25	U	25	26	U	26	26	U	26	25	U	25
Dimethyl phthalate	SVOA	22	U	22	22	U	22	23	U	23	23	U	23	22	U	22
Fluoranthene	SVOA	100	J	35	35	U	35	35	U	35	36	U	36	35	U	35
Fluorene	SVOA	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17
Hexachlorobenzene	SVOA	28	U	28	28	U	28	29	U	29	29	U	29	28	U	28
Hexachlorobutadiene	SVOA	9.7	U	9.7	9.6	U	9.6	9.8	U	9.8	9.9	U	9.9	9.6	U	9.6
Hexachlorocyclopentadiene	SVOA	49	U	49	48	U	48	49	U	49	49	U	49	48	U	48
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	20	U	20
Indeno(1,2,3-cd)pyrene	SVOA	55	J	21	21	U	21	22	U	22	22	U	22	21	U	21
Isophorone	SVOA	17	U	17	16	U	16	17	U	17	17	U	17	16	U	16
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	31	U	31	31	U	31	30	U	30
N-Nitrosodiphenylamine	SVOA	20	U	20	20	U	20	21	U	21	21	U	21	20	U	20
Naphthalene	SVOA	30	U	30	30	U	30	31	U	31	31	U	31	30	U	30
Nitrobenzene	SVOA	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21
Pentachlorophenol	SVOA	320	U	320	320	U	320	320	U	320	330	U	330	320	U	320
Phenanthrene	SVOA	36	J	17	16	U	16	17	U	17	17	U	17	16	U	16
Phenol	SVOA	17	U	17	17	U	17	18	U	18	18	U	18	17	U	17
Pyrene	SVOA	120	J	12	34	J	12	12	U	12	12	U	12	12	U	12

Attachment	1	Sheet No.	10 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	EXC-4 - J1PW09			EXC-5 - J1PW10			EXC-7 - J1PW12			EXC-8 - J1PW13			EXC-9 - J1PW14 a		
		7/25/12			7/25/12			7/25/12			7/25/12			7/25/12		
		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	28	U	28	27	U	27	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	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	11	U	11	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	13	U	13	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.5	U	9.5	9.7	U	9.7	10	U	10
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.5	U	9.5	9.7	U	9.7	10	U	10
2,4-Dichlorophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.5	U	9.5	9.7	U	9.7	10	U	10
2,4-Dimethylphenol	SVOA	66	U	66	66	U	66	63	U	63	64	U	64	66	U	66
2,4-Dinitrophenol	SVOA	330	UJX	330	330	UJ	330	320	UJ	320	320	UJ	320	330	UJ	330
2,4-Dinitrotoluene	SVOA	66	U	66	66	U	66	63	U	63	64	U	64	66	U	66
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.9	U	9.9	9.9	U	9.9	9.5	U	9.5	9.7	U	9.7	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	31	J	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	12	U	12	13	U	13	13	U	13
2-Nitroaniline	SVOA	50	U	50	50	U	50	48	U	48	48	U	48	50	U	50
2-Nitrophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.5	U	9.5	9.7	U	9.7	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	31	U	31	32	U	32	33	U	33
3,3'-Dichlorobenzidine	SVOA	90	UJ	90	89	UJ	89	86	UJ	86	87	UJ	87	90	UJ	90
3-Nitroaniline	SVOA	73	U	73	72	U	72	70	U	70	70	U	70	73	U	73
4,6-Dinitro-2-methylpheno	SVOA	330	U	330	330	U	330	310	U	310	320	U	320	330	U	330
4-Bromophenylphenyl ethe	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
4-Chloro-3-methylpheno	SVOA	66	U	66	66	U	66	63	U	63	64	U	64	66	U	66
4-Chloroaniline	SVOA	81	UJ	81	81	UJ	81	78	UJ	78	79	UJ	79	82	UJ	82
4-Chlorophenylphenyl ethe	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
4-Nitroaniline	SVOA	72	U	72	72	U	72	69	U	69	70	U	70	73	U	73
4-Nitrophenol	SVOA	96	U	96	96	U	96	92	U	92	94	U	94	97	U	97
Acenaphthene	SVOA	10	U	10	10	U	10	9.8	U	9.8	9.9	U	9.9	120	J	10
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	370		17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	1800		20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	1900		20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	25	U	25	25	U	25	2900	X	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	15	U	15	1200		16
Benzo(k)fluoranthene	SVOA	40	U	40	40	U	40	38	U	38	39	U	39	40	UX	40
Bis(2-chloro-1-methylethyl)ethe	SVOA	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	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ethe	SVOA	17	U	17	16	U	16	16	U	16	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	660	U	46	660	U	46	660	U	44	660	U	44	660	U	46
Butylbenzylphthalate	SVOA	43	U	43	43	U	43	41	U	41	42	U	42	43	U	43
Carbazole	SVOA	36	U	36	36	U	36	34	U	34	35	U	35	210	J	36
Chrysene	SVOA	27	U	27	27	U	27	26	U	26	26	U	26	2200		27
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	28	U	28	28	U	28	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19
Dibenzofuran	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	75	J	20
Diethyl phthalate	SVOA	26	U	26	26	U	26	25	U	25	25	U	25	26	U	26
Dimethyl phthalate	SVOA	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23
Fluoranthene	SVOA	36	U	36	36	U	36	34	U	34	35	U	35	2900		36
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	100	J	18
Hexachlorobenzene	SVOA	29	U	29	29	U	29	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.9	U	9.9	9.9	U	9.9	9.5	U	9.5	9.7	U	9.7	10	U	10
Hexachlorocyclopentadiene	SVOA	50	U	50	50	U	50	48	U	48	48	U	48	50	U	50
Hexachloroethane	SVOA	21	U	21	21	U	21	20	U	20	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	21	U	21	21	U	21	1100		22
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	21	U	21
Naphthalene	SVOA	31	U	31	31	U	31	30	U	30	30	U	30	31	U	31
Nitrobenzene	SVOA	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22
Pentachlorophenol	SVOA	330	U	330	330	U	330	310	U	310	320	U	320	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	1700		17
Phenol	SVOA	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	3100		12

Attachment	1	Sheet No.	11 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	EXC-10 - J1PW15			EXC-11 - J1PW16			EXC-12 - J1PW17			EXC-13 - J1PW18 a			Re-sample EXC-13 - J1R506		
		7/25/12			7/25/12			7/25/12			7/25/12			10/31/12		
		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	27	U	27	27	U	27	27	U	27	27	U	27	371	U	371
1,2-Dichlorobenzene	SVOA	22	U	22	21	U	21	22	U	22	21	U	21	371	U	371
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	371	U	371
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	371	U	371
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8	9.6	U	9.6	371	U	371
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8	9.6	U	9.6	371	U	371
2,4-Dichlorophenol	SVOA	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8	9.6	U	9.6	371	U	371
2,4-Dimethylphenol	SVOA	65	U	65	64	U	64	65	U	65	63	U	63	371	U	371
2,4-Dinitrophenol	SVOA	330	UJ	330	320	UJ	320	330	UJ	330	320	UJ	320	1860	U	1860
2,4-Dinitrotoluene	SVOA	65	U	65	64	U	64	65	U	65	63	U	63	371	U	371
2,6-Dinitrotoluene	SVOA	27	U	27	27	U	27	27	U	27	27	U	27	371	U	371
2-Chloronaphthalene	SVOA	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8	9.6	U	9.6	371	U	371
2-Chlorophenol	SVOA	21	U	21	20	U	20	21	U	21	20	U	20	371	U	371
2-Methylnaphthalene	SVOA	19	U	19	18	U	18	19	U	19	18	U	18	371	U	371
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	12	U	12	371	U	371
2-Nitroaniline	SVOA	49	U	49	49	U	49	49	U	49	48	U	48	1860	U	1860
2-Nitrophenol	SVOA	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8	9.6	U	9.6	371	U	371
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	32	U	32	32	U	32	371	U	371
3,3'-Dichlorobenzidine	SVOA	88	UJ	88	87	UJ	87	88	UJ	88	86	UJ	86	371	U	371
3-Nitroaniline	SVOA	72	U	72	71	U	71	71	U	71	70	U	70	1860	U	1860
4,6-Dinitro-2-methylpheno	SVOA	320	U	320	320	U	320	320	U	320	320	U	320	371	U	371
4-Bromophenylphenyl ethe	SVOA	19	U	19	18	U	18	19	U	19	18	U	18	371	U	371
4-Chloro-3-methylpheno	SVOA	65	U	65	64	U	64	65	U	65	63	U	63	371	U	371
4-Chloroaniline	SVOA	80	UJ	80	80	UJ	80	80	UJ	80	79	UJ	79	371	U	371
4-Chlorophenylphenyl ethe	SVOA	21	U	21	20	U	20	21	U	21	20	U	20	371	U	371
4-Nitroaniline	SVOA	71	U	71	70	U	70	71	U	71	70	U	70	1860	U	1860
4-Nitrophenol	SVOA	95	U	95	94	U	94	95	U	95	93	U	93	1860	U	1860
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	9.9	U	9.9	371	U	371
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	371	U	371
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	371	U	371
Benzo(a)anthracene	SVOA	73	J	20	19	U	19	20	U	20	19	U	19	371	U	371
Benzo(a)pyrene	SVOA	77	J	20	19	U	19	20	U	20	1000		19	371	U	371
Benzo(b)fluoranthene	SVOA	120	JX	26	25	U	25	26	U	26	1600	X	25	371	U	371
Benzo(ghi)perylene	SVOA	48	J	16	16	U	16	16	U	16	15	U	15	371	U	371
Benzo(k)fluoranthene	SVOA	39	UX	39	39	U	39	39	U	39	38	UX	38	371	U	371
Bis(2-chloro-1-methylethyl)ethe	SVOA	23	U	23	22	U	22	22	U	22	22	U	22	371	U	371
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	22	U	22	22	U	22	22	U	22	371	U	371
Bis(2-chloroethyl) ethe	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	371	U	371
Bis(2-ethylhexyl) phthalate	SVOA	660	U	45	660	U	45	660	U	45	660	U	44	371	U	371
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	42	U	42	41	U	41	371	U	371
Carbazole	SVOA	35	U	35	35	U	35	35	U	35	35	U	35	371	U	371
Chrysene	SVOA	92	J	26	26	U	26	26	U	26	26	U	26	371	U	371
Di-n-butylphthalate	SVOA	28	U	28	28	U	28	28	U	28	28	U	28	371	U	371
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	371	U	371
Dibenz[a,h]anthracene	SVOA	19	U	19	18	U	18	19	U	19	18	U	18	371	U	371
Dibenzofuran	SVOA	20	U	20	19	U	19	20	U	20	19	U	19	371	U	371
Diethyl phthalate	SVOA	25	U	25	25	U	25	25	U	25	25	U	25	371	U	371
Dimethyl phthalate	SVOA	23	U	23	22	U	22	22	U	22	22	U	22	371	U	371
Fluoranthene	SVOA	120	J	35	35	U	35	35	U	35	35	U	35	371	U	371
Fluorene	SVOA	18	U	18	17	U	17	18	U	18	17	U	17	371	U	371
Hexachlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	28	U	28	371	U	371
Hexachlorobutadiene	SVOA	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8	9.6	U	9.6	371	U	371
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	49	U	49	48	U	48	371	U	371
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	371	U	371
Indeno(1,2,3-cd)pyrene	SVOA	40	J	22	21	U	21	22	U	22	21	U	21	371	U	371
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	371	U	371
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	30	U	30	30	U	30	371	U	371
N-Nitrosodiphenylamine	SVOA	21	U	21	20	U	20	21	U	21	20	U	20	371	U	371
Naphthalene	SVOA	30	U	30	30	U	30	30	U	30	30	U	30	371	U	371
Nitrobenzene	SVOA	22	U	22	21	U	21	22	U	22	21	U	21	371	U	371
Pentachlorophenol	SVOA	320	U	320	320	U	320	320	U	320	320	U	320	1860	U	1860
Phenanthrene	SVOA	57	J	17	17	U	17	17	U	17	16	U	16	371	U	371
Phenol	SVOA	18	U	18	17	U	17	18	U	18	17	U	17	371	U	371
Pyrene	SVOA	130	J	12	12	U	12	12	U	12	12	U	12	371	U	371

Attachment	1	Sheet No.	12 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	FS-1 - J1PW34			FS-2 - J1PW35			FS-3 - J1PW36			FS-4 - J1PW37 a		
		7/25/12			7/25/12			7/25/12			7/25/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	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
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.9	U	9.9	10	U	10
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.9	U	9.9	10	U	10
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.9	U	9.9	10	U	10
2,4-Dimethylphenol	SVOA	65	U	65	66	U	66	65	U	65	66	U	66
2,4-Dinitrophenol	SVOA	330	UX	330	330	U	330	330	U	330	340	U	340
2,4-Dinitrotoluene	SVOA	65	U	65	66	U	66	65	U	65	66	U	66
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	28	U	28	28	U	28
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	9.9	U	9.9	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	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
2-Nitroaniline	SVOA	49	U	49	50	U	50	49	U	49	50	U	50
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	9.9	U	9.9	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	33	U	33	33	U	33
3,3'-Dichlorobenzidine	SVOA	89	U	89	90	U	90	89	U	89	91	U	91
3-Nitroaniline	SVOA	72	U	72	73	U	73	72	U	72	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	330	UX	330	330	U	330	330	U	330	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	66	U	66	65	U	65	66	U	66
4-Chloroaniline	SVOA	81	U	81	82	U	82	81	U	81	82	U	82
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	21	U	21
4-Nitroaniline	SVOA	72	U	72	72	U	72	72	U	72	73	U	73
4-Nitrophenol	SVOA	96	U	96	97	U	97	96	U	96	98	U	98
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	23	J	10
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	63	J	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	20	U	20	380		20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	20	U	20	430		20
Benzo(b)fluoranthene	SVOA	26	U	26	26	UX	26	26	U	26	670	X	26
Benzo(ghi)perylene	SVOA	16	U	16	16	J	16	16	U	16	280	J	16
Benzo(k)fluoranthene	SVOA	39	U	39	40	UX	40	40	U	40	40	UX	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	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
Bis(2-ethylhexyl) phthalate	SVOA	74	JB	45	76	JB	46	74	JB	45	87	JB	46
Butylbenzylphthalate	SVOA	42	UX	42	43	U	43	42	U	42	43	U	43
Carbazole	SVOA	36	U	36	36	U	36	36	U	36	39	J	36
Chrysene	SVOA	27	U	27	27	U	27	27	U	27	470		27
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	29	U	29	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	20	U	20	20	U	20	20	U	20	20	U	20
Diethyl phthalate	SVOA	26	U	26	26	U	26	26	U	26	26	U	26
Dimethyl phthalate	SVOA	23	U	23	23	U	23	23	U	23	23	U	23
Fluoranthene	SVOA	36	U	36	36	U	36	36	U	36	600		36
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	29	U	29
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	9.9	U	9.9	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	50	U	50	49	U	49	50	U	50
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	22	U	22	240	J	22
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	31	U	31	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	21	U	21	21	U	21
Naphthalene	SVOA	31	U	31	31	U	31	31	U	31	31	U	31
Nitrobenzene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22
Pentachlorophenol	SVOA	330	U	330	330	U	330	330	U	330	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	310	J	17
Phenol	SVOA	18	U	18	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	14	J	12	12	U	12	630		12

Attachment	1	Sheet No.	13 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	SPA-6 - J1PW25			Duplicate of J1PW25 - J1PW32			SPA-1 - J1PW20			SPA-2 - J1PW21			SPA-3 - J1PW22		
		11/13/12			11/13/12			11/13/12			11/13/12			11/13/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Aroclor-1221	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Aroclor-1232	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Aroclor-1242	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Aroclor-1248	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Aroclor-1254	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	34.1		14.9
Aroclor-1260	PCB	14.3	U	14.3	14.2	U	14.2	5.30	J	13.4	14.0	U	14.0	72.6		14.9
Aroclor-1262	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Aroclor-1268	PCB	14.3	U	14.3	14.2	U	14.2	13.4	U	13.4	14.0	U	14.0	14.9	U	14.9
Acenaphthene	PAH	1.24	J	3.54	3.59	U	3.59	0.880	J	3.32	2.86	J	3.53	75.1		3.75
Acenaphthylene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	6.43		3.75
Anthracene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	3.21	J	3.75
Benzo(a)anthracene	PAH	3.54	U	3.54	1.30	J	3.59	1.73	J	3.32	3.53	U	3.53	27.7		3.75
Benzo(a)pyrene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	23.3		3.75
Benzo(b)fluoranthene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	20.5		3.75
Benzo(ghi)perylene	PAH	0.921	J	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	31.4		3.75
Benzo(k)fluoranthene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	9.32		3.75
Chrysene	PAH	0.921	J	3.54	3.59	U	3.59	1.21	J	3.32	0.972	J	3.53	27.8		3.75
Dibenz[a,h]anthracene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	2.55	J	3.75
Fluoranthene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	48.6		3.75
Fluorene	PAH	7.65		3.54	6.53		3.59	7.09		3.32	6.79		3.53	8.44		3.75
Indeno(1,2,3-cd)pyrene	PAH	6.14		3.54	5.22		3.59	1.51	J	3.32	3.53	U	3.53	19.8		3.75
Naphthalene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	29.6		3.75
Phenanthrene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	27.7		3.75
Pyrene	PAH	3.54	U	3.54	3.59	U	3.59	3.32	U	3.32	3.53	U	3.53	38.8		3.75
1,1,1-Trichloroethane	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
1,1,2,2-Tetrachloroethane	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
1,1,2-Trichloroethane	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
1,1-Dichloroethane	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
1,1-Dichloroethene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
1,2-Dichloroethane	VOA	6.48	U	6.48	6.31	U	6.31	6.19	U	6.19	6.66	U	6.66	11.2	U	11.2
1,2-Dichloroethene(Total)	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
1,2-Dichloropropane	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
2-Butanone	VOA	13.0	U	13.0	12.6	U	12.6	12.4	U	12.4	13.3	U	13.3	22.3	U	22.3
2-Hexanone	VOA	13.0	U	13.0	12.6	U	12.6	12.4	U	12.4	13.3	U	13.3	22.3	U	22.3
4-Methyl-2-Pentanone	VOA	13.0	U	13.0	12.6	U	12.6	12.4	U	12.4	13.3	U	13.3	22.3	U	22.3
Acetone	VOA	13.0	U	13.0	12.6	U	12.6	12.4	U	12.4	13.3	U	13.3	22.3	U	22.3
Benzene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Bromodichloromethane	VOA	6.48	U	6.48	6.31	U	6.31	6.19	U	6.19	6.66	U	6.66	11.2	U	11.2
Bromoform	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Bromomethane	VOA	10.8	U	10.8	10.5	U	10.5	10.3	U	10.3	11.1	U	11.1	18.6	U	18.6
Carbon disulfide	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Carbon tetrachloride	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Chlorobenzene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Chloroethane	VOA	10.8	U	10.8	10.5	U	10.5	10.3	U	10.3	11.1	U	11.1	18.6	U	18.6
Chloroform	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Chloromethane	VOA	10.8	U	10.8	10.5	U	10.5	10.3	U	10.3	11.1	U	11.1	18.6	U	18.6
cis-1,2-Dichloroethylene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
cis-1,3-Dichloropropene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Dibromochloromethane	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Ethylbenzene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Methylenechloride	VOA	6.48	U	6.48	6.31	U	6.31	2.50	BJ	6.19	2.93	BJ	6.66	4.51	J	11.2
Styrene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Tetrachloroethene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Toluene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
trans-1,2-Dichloroethylene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
trans-1,3-Dichloropropene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Trichloroethene	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30
Vinyl chloride	VOA	10.8	U	10.8	10.5	U	10.5	10.3	U	10.3	11.1	U	11.1	18.6	U	18.6
Xylenes (total)	VOA	5.40	U	5.40	5.26	U	5.26	5.16	U	5.16	5.55	U	5.55	9.30	U	9.30

Attachment	1	Sheet No.	14 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	SPA-4 - J1PW23			SPA-5 - J1PW24			SPA-7 - J1PW26			SPA-8 - J1PW27			SPA-9 - J1PW28		
		11/13/12			11/13/12			11/13/12			11/13/12			11/13/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1221	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1232	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1242	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1248	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1254	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1260	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1262	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Aroclor-1268	PCB	14.3	U	14.3	14.0	U	14.0	14.7	U	14.7	13.3	U	13.3	13.9	U	13.9
Acenaphthene	PAH	3.58	U	3.58	21.2		3.62	3.73	U	3.73	19.4		3.46	5.06		3.47
Acenaphthylene	PAH	3.58	U	3.58	3.62	U	3.62	3.73	U	3.73	3.03	J	3.46	3.47	U	3.47
Anthracene	PAH	3.58	U	3.58	3.62	U	3.62	3.73	U	3.73	3.46	U	3.46	3.47	U	3.47
Benzo(a)anthracene	PAH	3.58	U	3.58	8.43		3.62	3.73	U	3.73	7.16		3.46	3.06	J	3.47
Benzo(a)pyrene	PAH	3.58	U	3.58	10.1		3.62	3.73	U	3.73	6.52		3.46	1.53	J	3.47
Benzo(b)fluoranthene	PAH	3.58	U	3.58	6.13		3.62	3.73	U	3.73	3.50		3.46	1.08	J	3.47
Benzo(ghi)perylene	PAH	3.58	U	3.58	10.9		3.62	3.73	U	3.73	5.78		3.46	1.65	J	3.47
Benzo(k)fluoranthene	PAH	3.58	U	3.58	3.63		3.62	3.73	U	3.73	2.82	J	3.46	3.47	U	3.47
Chrysene	PAH	3.58	U	3.58	8.90		3.62	1.05	J	3.73	9.17		3.46	2.57	J	3.47
Dibenz[a,h]anthracene	PAH	3.58	U	3.58	0.961	J	3.62	3.73	U	3.73	3.46	U	3.46	3.47	U	3.47
Fluoranthene	PAH	3.58	U	3.58	17.2		3.62	2.30	J	3.73	16.0		3.46	4.26		3.47
Fluorene	PAH	6.80		3.58	7.85		3.62	6.99		3.73	2.42	J	3.46	7.84		3.47
Indeno(1,2,3-cd)pyrene	PAH	5.48		3.58	5.04		3.62	1.79	J	3.73	3.22	J	3.46	2.66	J	3.47
Naphthalene	PAH	3.58	U	3.58	9.07		3.62	3.73	U	3.73	18.3		3.46	3.47	U	3.47
Phenanthrene	PAH	3.58	U	3.58	10.9		3.62	3.73	U	3.73	14.1		3.46	1.83	J	3.47
Pyrene	PAH	3.58	U	3.58	15.5		3.62	3.73	U	3.73	14.5		3.46	2.89	J	3.47
1,1,1-Trichloroethane	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
1,1,2,2-Tetrachloroethane	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
1,1,2-Trichloroethane	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
1,1-Dichloroethane	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
1,1-Dichloroethene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
1,2-Dichloroethane	VOA	6.51	U	6.51	7.27	U	7.27	6.24	U	6.24	4.77	U	4.77	4.62	U	4.62
1,2-Dichloroethene(Total)	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
1,2-Dichloropropane	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
2-Butanone	VOA	13.0	U	13.0	14.5	U	14.5	12.5	U	12.5	9.55	U	9.55	9.24	U	9.24
2-Hexanone	VOA	13.0	U	13.0	14.5	U	14.5	12.5	U	12.5	9.55	U	9.55	9.24	U	9.24
4-Methyl-2-Pentanone	VOA	13.0	U	13.0	14.5	U	14.5	12.5	U	12.5	9.55	U	9.55	9.24	U	9.24
Acetone	VOA	13.0	U	13.0	14.5	U	14.5	12.5	U	12.5	4.56	J	9.55	9.24	U	9.24
Benzene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Bromodichloromethane	VOA	6.51	U	6.51	7.27	U	7.27	6.24	U	6.24	4.77	U	4.77	4.62	U	4.62
Bromoform	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Bromomethane	VOA	10.9	U	10.9	12.1	U	12.1	10.4	U	10.4	7.96	U	7.96	7.70	U	7.70
Carbon disulfide	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Carbon tetrachloride	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Chlorobenzene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Chloroethane	VOA	10.9	U	10.9	12.1	U	12.1	10.4	U	10.4	7.96	U	7.96	7.70	U	7.70
Chloroform	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Chloromethane	VOA	10.9	U	10.9	12.1	U	12.1	10.4	U	10.4	7.96	U	7.96	7.70	U	7.70
cis-1,2-Dichloroethylene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
cis-1,3-Dichloropropene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Dibromochloromethane	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Ethylbenzene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Methylenechloride	VOA	6.51	U	6.51	7.27	U	7.27	2.26	J	6.24	1.61	BJ	4.77	1.69	J	4.62
Styrene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Tetrachloroethene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Toluene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
trans-1,2-Dichloroethylene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
trans-1,3-Dichloropropene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Trichloroethene	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85
Vinyl chloride	VOA	10.9	U	10.9	12.1	U	12.1	10.4	U	10.4	7.96	U	7.96	7.70	U	7.70
Xylenes (total)	VOA	5.43	U	5.43	6.06	U	6.06	5.20	U	5.20	3.98	U	3.98	3.85	U	3.85

Attachment	1	Sheet No.	15 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	SPA-10 - J1PW29			SPA-11 - J1PW30			Re-Sample SPA-11 - J1R794			SPA-12 - J1PW31			Equipment Blank - J1PW33		
		11/13/12			11/13/12			12/18/12			11/13/12			11/13/12		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1221	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1232	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1242	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1248	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1254	PCB	14.5	U	14.5	4.94	J	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1260	PCB	14.5	U	14.5	15.8		14.7				7.31	J	14.4	13.2	U	13.2
Aroclor-1262	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Aroclor-1268	PCB	14.5	U	14.5	14.7	U	14.7				14.4	U	14.4	13.2	U	13.2
Acenaphthene	PAH	9.99		3.62	604	D	7.17	33.2		3.51	37.6		3.48	3.25	U	3.25
Acenaphthylene	PAH	3.62	U	3.62	18.2	D	7.17	3.51	U	3.51	3.48	U	3.48	3.25	U	3.25
Anthracene	PAH	3.62	U	3.62	44.6	D	7.17	3.51	U	3.51	1.39	J	3.48	3.25	U	3.25
Benzo(a)anthracene	PAH	2.16	J	3.62	257	D	7.17	16.6		3.51	12.5		3.48	3.25	U	3.25
Benzo(a)pyrene	PAH	1.67	J	3.62	291	D	7.17	19.1		3.51	14.7		3.48	3.25	U	3.25
Benzo(b)fluoranthene	PAH	1.20	J	3.62	163	D	7.17	11.6		3.51	8.94		3.48	3.25	U	3.25
Benzo(ghi)perylene	PAH	1.47	J	3.62	310	D	7.17	12.4		3.51	17.7		3.48	3.25	U	3.25
Benzo(k)fluoranthene	PAH	3.62	U	3.62	96.5	D	7.17	5.89		3.51	5.58		3.48	3.25	U	3.25
Chrysene	PAH	2.45	J	3.62	181	D	7.17	12.1		3.51	22.1		3.48	3.25	U	3.25
Dibenz[a,h]anthracene	PAH	3.62	U	3.62	23.1	D	7.17	2.29	J	3.51	1.69	J	3.48	3.25	U	3.25
Fluoranthene	PAH	3.03	J	3.62	466	D	7.17	23.6		3.51	23.0		3.48	1.01	J	3.25
Fluorene	PAH	6.42		3.62	22.1	D	7.17	5.40		3.51	7.25		3.48	7.61		3.25
Indeno(1,2,3-cd)pyrene	PAH	2.66	J	3.62	119	D	7.17	12.9		3.51	10.9		3.48	3.25	U	3.25
Naphthalene	PAH	3.62	U	3.62	146	D	7.17	13.0		3.51	14.9		3.48	3.25	U	3.25
Phenanthrene	PAH	1.72	J	3.62	221	D	7.17	10.7		3.51	11.8		3.48	1.09	J	3.25
Pyrene	PAH	2.83	J	3.62	454	D	7.17	21.3		3.51	23.2		3.48	3.25	U	3.25
1,1,1-Trichloroethane	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
1,1,2,2-Tetrachloroethane	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
1,1,2-Trichloroethane	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
1,1-Dichloroethane	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
1,1-Dichloroethene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
1,2-Dichloroethane	VOA	6.13	U	6.13	5.62	U	5.62				5.69	U	5.69			
1,2-Dichloroethene(Total)	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
1,2-Dichloropropane	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
2-Butanone	VOA	12.3	U	12.3	11.2	U	11.2				11.4	U	11.4			
2-Hexanone	VOA	12.3	U	12.3	11.2	U	11.2				11.4	U	11.4			
4-Methyl-2-Pentanone	VOA	12.3	U	12.3	11.2	U	11.2				11.4	U	11.4			
Acetone	VOA	12.3	U	12.3	11.2	U	11.2				11.4	U	11.4			
Benzene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Bromodichloromethane	VOA	6.13	U	6.13	5.62	U	5.62				5.69	U	5.69			
Bromoform	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Bromomethane	VOA	10.2	U	10.2	9.36	U	9.36				9.48	U	9.48			
Carbon disulfide	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Carbon tetrachloride	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Chlorobenzene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Chloroethane	VOA	10.2	U	10.2	9.36	U	9.36				9.48	U	9.48			
Chloroform	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Chloromethane	VOA	10.2	U	10.2	9.36	U	9.36				9.48	U	9.48			
cis-1,2-Dichloroethylene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
cis-1,3-Dichloropropene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Dibromochloromethane	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Ethylbenzene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Methylenechloride	VOA	6.13	U	6.13	1.95	J	5.62				2.67	J	5.69			
Styrene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Tetrachloroethene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Toluene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
trans-1,2-Dichloroethylene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
trans-1,3-Dichloropropene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Trichloroethene	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			
Vinyl chloride	VOA	10.2	U	10.2	9.36	U	9.36				9.48	U	9.48			
Xylenes (total)	VOA	5.11	U	5.11	4.68	U	4.68				4.74	U	4.74			

Attachment	1	Sheet No.	16 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	Trip Blank - J1R5M1		
		11/13/12		
		ug/kg	Q	PQL
Aroclor-1016	PCB			
Aroclor-1221	PCB			
Aroclor-1232	PCB			
Aroclor-1242	PCB			
Aroclor-1248	PCB			
Aroclor-1254	PCB			
Aroclor-1260	PCB			
Aroclor-1262	PCB			
Aroclor-1268	PCB			
Acenaphthene	PAH			
Acenaphthylene	PAH			
Anthracene	PAH			
Benzo(a)anthracene	PAH			
Benzo(a)pyrene	PAH			
Benzo(b)fluoranthene	PAH			
Benzo(ghi)perylene	PAH			
Benzo(k)fluoranthene	PAH			
Chrysene	PAH			
Dibenz[a,h]anthracene	PAH			
Fluoranthene	PAH			
Fluorene	PAH			
Indeno(1,2,3-cd)pyrene	PAH			
Naphthalene	PAH			
Phenanthrene	PAH			
Pyrene	PAH			
1,1,1-Trichloroethane	VOA	6.43	U	6.43
1,1,2,2-Tetrachloroethane	VOA	6.43	U	6.43
1,1,2-Trichloroethane	VOA	6.43	U	6.43
1,1-Dichloroethane	VOA	6.43	U	6.43
1,1-Dichloroethene	VOA	6.43	U	6.43
1,2-Dichloroethane	VOA	7.71	U	7.71
1,2-Dichloroethene(Total)	VOA	6.43	U	6.43
1,2-Dichloropropane	VOA	6.43	U	6.43
2-Butanone	VOA	15.4	U	15.4
2-Hexanone	VOA	15.4	U	15.4
4-Methyl-2-Pentanone	VOA	15.4	U	15.4
Acetone	VOA	15.8		15.4
Benzene	VOA	6.43	U	6.43
Bromodichloromethane	VOA	7.71	U	7.71
Bromoform	VOA	6.43	U	6.43
Bromomethane	VOA	12.9	U	12.9
Carbon disulfide	VOA	6.43	U	6.43
Carbon tetrachloride	VOA	6.43	U	6.43
Chlorobenzene	VOA	6.43	U	6.43
Chloroethane	VOA	12.9	U	12.9
Chloroform	VOA	6.43	U	6.43
Chloromethane	VOA	12.9	U	12.9
cis-1,2-Dichloroethylene	VOA	6.43	U	6.43
cis-1,3-Dichloropropene	VOA	6.43	U	6.43
Dibromochloromethane	VOA	6.43	U	6.43
Ethylbenzene	VOA	6.43	U	6.43
Methylenechloride	VOA	3.68	J	7.71
Styrene	VOA	6.43	U	6.43
Tetrachloroethene	VOA	6.43	U	6.43
Toluene	VOA	6.43	U	6.43
trans-1,2-Dichloroethylene	VOA	6.43	U	6.43
trans-1,3-Dichloropropene	VOA	6.43	U	6.43
Trichloroethene	VOA	6.43	U	6.43
Vinyl chloride	VOA	12.9	U	12.9
Xylenes (total)	VOA	6.43	U	6.43

Attachment	1	Sheet No.	17 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	SPA-6 - J1PW25			Duplicate of J1PW25 - J1PW32			SPA-1 - J1PW20			SPA-2 - J1PW21			SPA-3 - J1PW22		
		11/13/12			11/13/12			11/13/12			11/13/12			11/13/12		
		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	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
1,2-Dichlorobenzene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
1,3-Dichlorobenzene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
1,4-Dichlorobenzene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2,4,5-Trichlorophenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2,4,6-Trichlorophenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2,4-Dichlorophenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2,4-Dimethylphenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2,4-Dinitrophenol	SVOA	1770	U	1770	1780	U	1780	1690	U	1690	1740	U	1740	1870	U	1870
2,4-Dinitrotoluene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2,6-Dinitrotoluene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2-Chloronaphthalene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2-Chlorophenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2-Methylnaphthalene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2-Methylphenol (cresol, o-)	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
2-Nitroaniline	SVOA	1770	U	1770	1780	U	1780	1690	U	1690	1740	U	1740	1870	U	1870
2-Nitrophenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
3,3'-Dichlorobenzidine	SVOA	710	U	710	712	U	712	674	U	674	695	U	695	750	U	750
3+4 Methylphenol (cresol, m+p)	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
3-Nitroaniline	SVOA	1770	U	1770	1780	U	1780	1690	U	1690	1740	U	1740	1870	U	1870
4,6-Dinitro-2-methylpheno	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
4-Bromophenylphenyl ether	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
4-Chloro-3-methylpheno	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
4-Chloroaniline	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
4-Chlorophenylphenyl ether	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
4-Nitroaniline	SVOA	1770	U	1770	1780	U	1780	1690	U	1690	1740	U	1740	1870	U	1870
4-Nitrophenol	SVOA	1770	U	1770	1780	U	1780	1690	U	1690	1740	U	1740	1870	U	1870
Acenaphthene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Acenaphthylene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Anthracene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Benzo(a)anthracene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	80.7	J	375
Benzo(a)pyrene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Benzo(b)fluoranthene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	68.4	J	375
Benzo(ghi)perylene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Benzo(k)fluoranthene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	62.5	J	375
Bis(2-chloro-1-methylethyl)ethe	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Bis(2-Chloroethoxy)methane	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Bis(2-chloroethyl) ether	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Bis(2-ethylhexyl) phthalate	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	132	J	375
Butylbenzylphthalate	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Carbazole	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Chrysene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	106	J	375
Dibenz[a,h]anthracene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Dibenzofuran	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Diethyl phthalate	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Dimethyl phthalate	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Di-n-butylphthalate	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Di-n-octylphthalate	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Fluoranthene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	188	J	375
Fluorene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Hexachlorobenzene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Hexachlorobutadiene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Hexachlorocyclopentadiene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Hexachloroethane	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Indeno(1,2,3-cd)pyrene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Isophorone	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Naphthalene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Nitrobenzene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
N-Nitroso-di-n-dipropylamine	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
N-Nitrosodiphenylamine	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Pentachlorophenol	SVOA	1770	U	1770	1780	U	1780	1690	U	1690	1740	U	1740	1870	U	1870
Phenanthrene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	98.1	J	375
Phenol	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	375	U	375
Pyrene	SVOA	355	U	355	356	U	356	337	U	337	348	U	348	175	J	375

Attachment	1	Sheet No.	18 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	SPA-4 - J1PW23			SPA-5 - J1PW24			SPA-7 - J1PW26			SPA-8 - J1PW27			SPA-9 - J1PW28		
		11/13/12			11/13/12			11/13/12			11/13/12			11/13/12		
		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	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
1,2-Dichlorobenzene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
1,3-Dichlorobenzene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
1,4-Dichlorobenzene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2,4,5-Trichlorophenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2,4,6-Trichlorophenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2,4-Dichlorophenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2,4-Dimethylphenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2,4-Dinitrophenol	SVOA	1790	U	1790	1780	U	1780	1850	U	1850	1680	U	1680	1770	U	1770
2,4-Dinitrotoluene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2,6-Dinitrotoluene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2-Chloronaphthalene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2-Chlorophenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2-Methylnaphthalene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2-Methylphenol (cresol, o-)	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
2-Nitroaniline	SVOA	1790	U	1790	1780	U	1780	1850	U	1850	1680	U	1680	1770	U	1770
2-Nitrophenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
3,3'-Dichlorobenzidine	SVOA	714	U	714	711	U	711	738	U	738	672	U	672	708	U	708
3+4 Methylphenol (cresol, m+p)	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
3-Nitroaniline	SVOA	1790	U	1790	1780	U	1780	1850	U	1850	1680	U	1680	1770	U	1770
4,6-Dinitro-2-methylpheno	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
4-Bromophenylphenyl ether	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
4-Chloro-3-methylpheno	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
4-Chloroaniline	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
4-Chlorophenylphenyl ether	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
4-Nitroaniline	SVOA	1790	U	1790	1780	U	1780	1850	U	1850	1680	U	1680	1770	U	1770
4-Nitrophenol	SVOA	1790	U	1790	1780	U	1780	1850	U	1850	1680	U	1680	1770	U	1770
Acenaphthene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Acenaphthylene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Anthracene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Benzo(a)anthracene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Benzo(a)pyrene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Benzo(b)fluoranthene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Benzo(ghi)perylene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Benzo(k)fluoranthene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Bis(2-chloro-1-methylethyl)ethe	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Bis(2-Chloroethoxy)methane	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Bis(2-chloroethyl) ether	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Bis(2-ethylhexyl) phthalate	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Butylbenzylphthalate	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Carbazole	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Chrysene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Dibenz[a,h]anthracene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Dibenzofuran	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Diethyl phthalate	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Dimethyl phthalate	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Di-n-butylphthalate	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Di-n-octylphthalate	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Fluoranthene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Fluorene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Hexachlorobenzene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Hexachlorobutadiene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Hexachlorocyclopentadiene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Hexachloroethane	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Indeno(1,2,3-cd)pyrene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Isophorone	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Naphthalene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Nitrobenzene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
N-Nitroso-di-n-dipropylamine	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
N-Nitrosodiphenylamine	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Pentachlorophenol	SVOA	1790	U	1790	1780	U	1780	1850	U	1850	1680	U	1680	1770	U	1770
Phenanthrene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Phenol	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354
Pyrene	SVOA	357	U	357	355	U	355	369	U	369	336	U	336	354	U	354

Attachment	1	Sheet No.	19 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Attachment 1. 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Verification Sample Results (Organics).

LOCATION	CLASS	SPA-10 - J1PW29			SPA-11 - J1PW30			Re-Sample SPA-11 - J1R794			SPA-12 - J1PW31			Equipment Blank - J1PW33		
		11/13/12			11/13/12			12/18/12			11/13/12			11/13/12		
		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	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
1,2-Dichlorobenzene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
1,3-Dichlorobenzene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
1,4-Dichlorobenzene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2,4,5-Trichlorophenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2,4,6-Trichlorophenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2,4-Dichlorophenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2,4-Dimethylphenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2,4-Dinitrophenol	SVOA	1790	U	1790	3660	U	3660	1760	U	1760	1760	U	1760	1620	U	1620
2,4-Dinitrotoluene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2,6-Dinitrotoluene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2-Chloronaphthalene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2-Chlorophenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2-Methylnaphthalene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2-Methylphenol (cresol, o-)	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
2-Nitroaniline	SVOA	1790	U	1790	3660	U	3660	1760	U	1760	1760	U	1760	1620	U	1620
2-Nitrophenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
3,3'-Dichlorobenzidine	SVOA	717	U	717	1460	U	1460	706	U	706	705	U	705	647	U	647
3+4 Methylphenol (cresol, m+p)	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
3-Nitroaniline	SVOA	1790	U	1790	3660	U	3660	1760	U	1760	1760	U	1760	1620	U	1620
4,6-Dinitro-2-methylpheno	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
4-Bromophenylphenyl ethe	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
4-Chloro-3-methylpheno	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
4-Chloroaniline	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
4-Chlorophenylphenyl ethe	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
4-Nitroaniline	SVOA	1790	U	1790	3660	U	3660	1760	U	1760	1760	U	1760	1620	U	1620
4-Nitrophenol	SVOA	1790	U	1790	3660	U	3660	1760	U	1760	1760	U	1760	1620	U	1620
Acenaphthene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Acenaphthylene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Anthracene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Benzo(a)anthracene	SVOA	359	U	359	255	DJ	732	353	U	353	353	U	353	324	U	324
Benzo(a)pyrene	SVOA	359	U	359	259	DJ	732	353	U	353	353	U	353	324	U	324
Benzo(b)fluoranthene	SVOA	359	U	359	204	DJ	732	353	U	353	353	U	353	324	U	324
Benzo(ghi)perylene	SVOA	359	U	359	186	DJ	732	353	U	353	353	U	353	324	U	324
Benzo(k)fluoranthene	SVOA	359	U	359	258	DJ	732	353	U	353	353	U	353	324	U	324
Bis(2-chloro-1-methylethyl)ethe	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Bis(2-Chloroethoxy)methane	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Bis(2-chloroethyl) ethe	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Bis(2-ethylhexyl) phthalate	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Butylbenzylphthalate	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Carbazole	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Chrysene	SVOA	359	U	359	368	JD	732	353	U	353	353	U	353	324	U	324
Dibenz[a,h]anthracene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Dibenzofuran	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Diethyl phthalate	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Dimethyl phthalate	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Di-n-butylphthalate	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Di-n-octylphthalate	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Fluoranthene	SVOA	359	U	359	469	JD	732	353	U	353	353	U	353	324	U	324
Fluorene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Hexachlorobenzene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Hexachlorobutadiene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Hexachlorocyclopentadiene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Hexachloroethane	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Indeno(1,2,3-cd)pyrene	SVOA	359	U	359	151	JD	732	353	U	353	353	U	353	324	U	324
Isophorone	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Naphthalene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Nitrobenzene	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
N-Nitroso-di-n-dipropylamine	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
N-Nitrosodiphenylamine	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Pentachlorophenol	SVOA	1790	U	1790	3660	U	3660	1760	U	1760	1760	U	1760	1620	U	1620
Phenanthrene	SVOA	359	U	359	288	JD	732	353	U	353	353	U	353	324	U	324
Phenol	SVOA	359	U	359	732	U	732	353	U	353	353	U	353	324	U	324
Pyrene	SVOA	359	U	359	528	JD	732	353	U	353	353	U	353	324	U	324

Attachment	1	Sheet No.	20 of 20
Originator	J. D. Skoglie	Date	1/28/13
Checked	N. K. Schiffern	Date	1/28/13
Calc. No.	0100N-CA-V0163	Rev. No.	0

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-N Field Remediation Job No. 14655

Area: 100-N

Discipline: Environmental Calculation No: 0100N-CA-V0166

Subject: 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites 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	N. K. Schiffern	I. B. Berezovskiy	D. F. Obenauer	2/26/13

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007)

DE01-437.03

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	1/28/2013	Calc. No.:	0100N-CA-V0166	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	1/28/2013
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2006b), 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, 2006a, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites*, DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2006b, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area*, DOE/RL-2005-93, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) Ecology, 2012, "*128-N-1 Additional Remediation Proposal*", CCN 168091, E-Mail Message October 11, 2012 to Joshua E. Jakubek, Washington Closure Hanford from Wanda Elliott, Washington State Department of Ecology, Richland Operations Office, Richland, Washington.

4) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

5) WCH, 2013, *100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Cleanup Verification 95% UCL Calculations, Calculation Number 0100N-CA-V0163*, 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 2006b).

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 2006b).

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:	1/28/2013	Calc. No.:	0100N-CA-V0166	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	1/28/2013
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 4	

METHODOLOGY:

The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites are comprised of two decision units for verification sampling consisting of the excavation area and staging pile area and four focused samples. The direct contact hazard quotient and carcinogenic risk calculations for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites were conservatively calculated for the entirety of the waste sites using the greater of the maximum or statistical verification soil sample results (WCH 2013). Sample locations EXC-9, EXC-13, SPA-11, and FS-4 exceeded direct exposure cleanup levels for multiple constituents. These four areas were remediated and re-sampled as discussed in the 128-N-1 Additional Remediation Proposal agreement (Ecology 2012). Of the contaminants of potential concern (COPCs) for these sites, boron, molybdenum, the detected polycyclic aromatic hydrocarbons (PAHs), the detected semivolatiles (SVOCs), the detected polychlorinated biphenyls (PCBs), and the detected volatiles require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Chromium, copper, nickel, and selenium are included because they were quantitated at a concentration above Hanford Site background. 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. 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. 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 3.18 mg/kg, divided by the noncarcinogenic RAG value of 16,000 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is 2.0×10^{-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 6.1×10^{-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(b)flouranthene is 0.094 mg/kg, divided by 1.37 mg/kg, and multiplied as indicated, is 6.9×10^{-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 1.2×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	1/28/2013	Calc. No.:	0100N-CA-V0166	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	1/28/2013
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 4	

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

List the cumulative excess cancer risk for carcinogens >1 x 10^{-5}: None

Table 1 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites (2 Pages).

Contaminants of Potential Concern	Maximum or Statistical Value [a] (mg/kg)	Noncarcinogen RAG [b] (mg/kg)	Hazard Quotient	Carcinogen RAG [b] (mg/kg)	Carcinogen Risk
Metals					
Boron	3.18	16,000	2.0E-04	--	--
Chromium, total	22.1	120,000	1.8E-04	--	--
Copper	65.2	2,960	2.2E-02	--	--
Lead [c]	43.8	353	--	--	--
Molybdenum	0.736	400	1.8E-03	--	--
Nickel	20.7	1,600	1.3E-02	--	--
Selenium	0.799	400	2.0E-03	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.132	1,600	8.3E-05	71.4	1.8E-09
Carbazole	0.21	--	--	50	4.2E-09
Dibenzofuran	0.075	160	4.7E-04	--	--
Di-n-octylphthalate	0.076	1,600	4.8E-05	--	--
Methylnapthalene; 2-	0.031	320	9.7E-05	--	--
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.127	4,800	2.6E-05	--	--
Acenaphthylene [d]	0.00643	4,800	1.3E-06	--	--
Anthracene	0.015	24,000	6.3E-07	--	--
Benzo(a)anthracene	0.054	--	--	1.37	3.9E-08
Benzo(a)pyrene	0.093	--	--	0.137	6.8E-07
Benzo(b)fluoranthene	0.094	--	--	1.37	6.9E-08
Benzo(ghi)perylene [d]	0.075	2,400	3.1E-05	--	--
Benzo(k)fluoranthene	0.039	--	--	13.7	2.8E-09
Chrysene	0.084	--	--	137	6.1E-10
Dibenz(a,h)anthracene	0.019	--	--	0.137	1.4E-07
Fluoranthene	0.11	3,200	3.4E-05	--	--
Fluorene	0.0094	3,200	2.9E-06	--	--
Indeno(1,2,3-cd)pyrene	0.070	--	--	1.37	5.1E-08
Naphthalene	0.0296	1,600	1.9E-05	--	--
Phenanthrene [d]	0.046	24,000	1.9E-06	--	--
Pyrene	0.14	2,400	5.8E-05	--	--

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	1/28/2013	Calc. No.:	0100N-CA-V0166	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	1/28/2013
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites (2 Pages).

Contaminants of Potential Concern	Maximum or Statistical Value [a] (mg/kg)	Noncarcinogen RAG [b] (mg/kg)	Hazard Quotient	Carcinogen RAG [b] (mg/kg)	Carcinogen Risk
Polychlorinated Biphenyls					
Aroclor-1254	0.0341	1.6	2.1E-02	0.5	6.8E-08
Aroclor-1260	0.0726	--	--	0.5	1.5E-07
Total Petroleum Hydrocarbons					
TPH - Diesel Range EXT [e]	43	200	--	--	--
Volatiles					
Acetone	0.0086	72,000	1.2E-07	--	--
Dichloroethene; 1,1	0.00075	4,000	1.9E-07	1.67	4.5E-10
Methylene chloride	0.018	4,800	3.8E-06	133	1.4E-10
Styrene	0.0012	16,000	7.5E-08	33.3	3.6E-11
Totals					
Cumulative Hazard Quotient:			**6.1E-02**		
Cumulative Excess Cancer Risk:					**1.2E-06**

Notes:

[a] = From WCH (2013).

[b] = Value obtained from the 100-N Area RDR/RAWP (DOE-RL 2006b) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = 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.

[d] = Toxicity data for these chemicals are not available. The cleanup levels are based on use of surrogate chemicals.
acenaphthylene surrogate: acenaphthene
benzo(g,h,i)perylene surrogate: pyrene
phenanthrene surrogate: anthracene

[e] = 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 demonstrate that the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites meet the requirements for the direct contact hazard quotients and carcinogenic (excess cancer) risk, respectively, as identified in the RDR/RAWP (DOE-RL 2006b) and SAP (DOE-RL 2006a). The direct contact hazard quotients and carcinogenic (excess cancer) risk calculations are for use in the RSVP for these sites.

Acrobat 8.0

CALCULATION COVER SHEET

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

Area: 100-N

Discipline: Environmental *Calculation No: 0100N-CA-V0167

Subject: 100-N-6, 100-N-16, 100-N-98, and 128-N-1 HQ and Carcinogenic Risk Calculation for Protection of GW

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 = 3 Total = 4	J. D. Skoglie	N. K. Schiffern	I. B. Berezovskiy	D. F. Obenauer	2/26/13

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:	J. D. Skoglie	Date:	01/28/13	Calc. No.:	0100N-CA-V0167	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	01/28/13
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 HQ and Carcinogenic Risk Calculation for Protection of Groundwater					Sheet No. 1 of 3	

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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) for the 100-N Area (DOE-RL 2006), 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, 2006, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area,* DOE/RL-2005-93, Rev. 0, 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, 2013, *100-N-6, 100-N-16, 100-N-98, and 128-N-1 Waste Sites Cleanup Verification 95% UCL Calculations*, Calculation Number 0100N-CA-V0163, 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 2006).

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 2006).

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:	01/28/13	Calc. No.:	0100N-CA-V0167	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	01/28/13
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 HQ and Carcinogenic Risk Calculation for Protection of Groundwater					Sheet No. 2 of 3	

METHODOLOGY:

The 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites are comprised of two decision units for verification sampling, consisting of the excavation, staging pile area, and four focused samples. The protection of groundwater hazard quotient and carcinogenic risk calculations for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites were conservatively calculated for the entire waste site using the statistical or maximum value for each analyte (WCH 2013). Based on the generic site RESRAD model (DOE-RL 2006) and a vadose zone of approximately 18 m (59 ft) thickness, a K_d of 4.1 or greater is required to show no predicted migration to groundwater in 1,000 years. Boron, 2-methylnaphthalene, naphthalene, and the detected volatiles are included because they have a K_d of less than 4.1, and no Hanford background value has been established. All other site nonradionuclide COPCs were undetected, quantified below background levels, or have a K_d greater than or equal to 4.1. 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 (μg/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 μg (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 3.18 mg/kg, divided by the noncarcinogenic RAG value of 320 mg/kg is 9.9×10^{-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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites is 9.7×10^{-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, and then multiplied by 1×10^{-6}. For example, the maximum value for styrene is 0.0012 mg/kg, divided by 0.146 mg/kg, and multiplied as indicated, is 8.2×10^{-9}. Comparing this value and all other individual carcinogenic risk values to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After the individual carcinogenic risk calculations are completed for the appropriate analytes, the cumulative excess cancer risk can be obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual carcinogenic risk values prior to rounding are used for this calculation.) The cumulative excess cancer risk for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites are 1.4×10^{-7}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

5) 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

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	01/28/13	Calc. No.:	0100N-CA-V0167	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	N. K. Schiffern	Date:	01/28/13
Subject:	100-N-6, 100-N-16, 100-N-98, and 128-N-1 HQ and Carcinogenic Risk Calculation for Protection of Groundwater					Sheet No.	3 of 3

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.

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites.

Contaminants of Potential Concern	Maximum or Statistical Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	3.18	320	9.9E-03	--	--
Semivolatiles					
Methylnapthalene; 2-	0.031	3.2	9.7E-03	--	--
Polycyclic aromatic hydrocarbons					
Naphthalene	0.0296	16	1.9E-03	--	--
Volatiles					
Acetone	0.0086	720	1.2E-05	--	--
Dichloroethene;1,1-	0.00075	40	7.5E-02	0.00729	1.0E-07
Methylene chloride	0.018	48	3.8E-04	0.583	3.1E-08
Styrene	0.0012	160	7.5E-06	0.146	8.2E-09
Totals					
Cumulative Hazard Quotient:			**9.7E-02**		
Cumulative Excess Cancer Risk:					**1.4E-07**

Notes:
[a] = From WCH (2013).
[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the
-- = not applicable
RAG = remedial action goal

CONCLUSION:

This calculation demonstrates that the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites meet the requirements for the hazard quotients and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2006).

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 2012d). This DQA was performed in accordance with site-specific data quality objectives found in the *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (SAP)* (DOE-RL 2006).

A review of the sample design (WCH 2012d), the field logbooks (WCH 2012a, WCH 2012b, and WCH 2012c), 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites were provided by the laboratories in sample delivery groups (SDGs) J01573, J01574, K4024, KP0143, and KP0169. SDG J01573 was submitted for third-party validation. No major deficiencies were identified in the analytical data set. Minor deficiencies are discussed for the 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.

MINOR DEFICIENCIES

SDG J01573

This SDG comprises 14 statistical soil samples (J1PW06 through J1PW19) from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 excavation and includes 1 field duplicate pair (J1PW11/J1PW19). These samples were analyzed for inductively coupled plasma (ICP) metals, mercury, polychlorinated biphenyls (PCB), semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAH), volatile organic compounds (VOCs), and total petroleum hydrocarbons (TPH). SDG J01573 was submitted for third-party validation. Minor deficiencies are as follows:

In the VOCs analysis, due to the matrix spike (MS) recoveries outside of quality control (QC) limits (all bromomethane (45%), 2-butanone (173%), carbon disulfide (0%), styrene (25%), and vinyl chloride (49%) results) were qualified as estimated, with "J" flags, by

third-party validation. Due to matrix spike duplicate (MSD) recovery outside of QC limits, all 1,1,2,2-tetrachloroethane (39%) were qualified as estimated, with "J" flags, by third-party validation. Due to MS/MSD relative percent difference calculations (RPDs) outside of QC limits, all acetone (78%), benzene (34%), bromodichloromethane (31%), 2-butanone (76%), 1,2-dichloroethane (52%), 1,2-dichloropropane (37%), 4-methyl-2-pentanone (37%), styrene (82%), 1,1,2,2-tetrachloroethane (72%), and 1,1,2-trichloroehtane (52%) were qualified as estimated, with "J" flags, by third-party validation. Estimated data are usable for decision-making purposes.

In the VOC analysis, no trip blank was collected. There is no impact to the field sample data. The data are usable for decision-making purposes.

In the SVOC analysis, due to method blank contamination, all bis(2-ethylhexyl)phalate results were raised to the required quantitation limit (RQL) and qualified as undetected, with "U" flags, by third-party validation. The laboratory control sample (LCS) recoveries for 4-chloroanaline (48%) and 3,3-dichlorobenzidine (38%) were below the QC criteria. The MS and MSD recoveries for 2,4-dinitrophenol (45% and 44%, respectively) were also below the QC criteria. Due to the low LSC, MS, or MSD recoveries for these analytes, third-party validation qualified all the results for these analytes as estimates and flagged "J." Estimated data are acceptable for decision-making purposes.

In the PAH analysis, a surrogate recovery was above the QC limit for sample J1PW14. All detected PAH results for sample J1PW14 were qualified as estimated with "J" flags. Estimated data are acceptable for decision-making purposes.

In the PCB analysis, a surrogate recovery was above the QC limit for sample J1PW14. The aroclor-1254 and aroclor-1260 results for sample J1PW14 were qualified as estimated with "J" flags by third-party validation. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of acceptance criteria for antimony (56%), chromium (65%), nickel (65%), and silicon (14%). Aluminum (1,062%), iron (1,554%), and manganese (139%) also had MS recoveries above acceptance criteria. 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, chromium, nickel, and silicon did not have mismatched spike and native concentrations in the MS. All antimony, chromium, nickel, and silicon data for SDG J01573 were qualified as estimated, with "J" flags, by third-party validation due to the MS recoveries outside the QC limits. All aluminum, iron, and manganese may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, due to the LCS recovery outside the quality control limits, all silicon (21%) data were qualified by third-party validation as estimated with "J" flags. Due to MS/MSD RPDs outside of QC limits, all chromium (57%), magnesium (36%), and nickel (77%) were qualified as estimated, with "J" flags, by third-party validation. Estimated data are usable for decision-making purposes.

SDG K4024

This SDG comprises 13 statistical soil samples (J1PW20 through J1PW32) and 1 trip blank (J1R5M1) from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 staging pile area. This SDG also includes one field duplicate pair (J1PW25/J1PW32). The samples were analyzed for ICP metals, mercury, PCBs, pesticides, SVOCs, PAHs, VOCs, and TPH.

In the VOCs analysis, acetone and methylene chloride were detected in the trip blank. Acetone and methylene were detected in several field samples but all detections were less than the practical quantitation limit. Therefore, there is no significant impact to the field sample data. These data are usable for decision-making purposes.

In the VOCs analysis, the MS recovery for bromomethane (57%) is below QC limits but the MSD recovery (88%) is acceptable. The resulting MS/MSD RPD calculation for bromomethane (43%) is above QC limits. Elevated RPDs in environmental samples are generally attributed to natural heterogeneities in the sample matrix. There is no indication that the analytical system was operating out of control. The data are usable for decision-making purposes. All bromomethane data may be considered estimated.

In the SVOA analysis, surrogate recoveries were outside of laboratory QC limits for samples J1PW22, J1PW23, J1PW24, J1PW27, JlPW28, JlPW30, JlPW31, JlPW32, and J1PW33. Detected analytes in these samples were qualified as estimated, with "J" flags applied by the laboratory. All SVOA data for these samples may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOA analysis, the LCS recoveries were above laboratory QC limits for 2,4-dinitrotoluene (121%), 2-nitroaniline (125%), 4-bromophenyl phenyl ether (137%), 4-chloro phenyl ether (123%), benzo(g,h,i)perylene (133%), dibenz(a,h)anthracene (144%), hexachlorobenzene (183%), hexachlorobutadiene (128%), and indeno(1,2,3-cd) pyrene (139%). Benzo(g,h,i)perylene was the only analyte detected in these samples (J1PW30 only) and was qualified as estimated, with a "J" flag applied by the laboratory. All SVOA data may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOA analysis, the MS recoveries were outside QC limits for 1,2,4-trichlorobenzene (61%), 2,4,5-trichlorophenol (67%), 2,4,6-trichlorophenol (31%), 2,4-dichlorophenol (66%), 2-methylnaphthalene (66%), 2-nitrophenol (69%), 3,3'-dichlorobenzidine (55%), 3-nitroaniline (68%), 4-chloro-3-methylphenol (69%), 4-chloroaniline (25%), 4-nitrophenol (30%), bis(2-ethylhexyl)phthalate (132%), hexachlorobutadiene (67%), hexachlorocyclopentadiene (65%), isophorone (69%), nitrobenzene (68%), and pentachlorophenol (13%). The MSD recoveries were outside QC limits for 1,2,4-trichlorobenzene (46%), 1,2-dichlorobenzene (54%), 1,3-dichlorobenzene (50%), 1,4- dichlorobenzene (51%), 2,4,5-trichlorophenol (19%), 2,4,6-trichlorophenol (8%), 2,4-dichlorophenol (37%), 2,4-dimethylphenol (47%), 2-chlorophenol (59%), 2-methylnaphthalene (51%), 2-methylphenol (68%), 2-nitrophenol (49%), 3,3'-dichlorobenzidine (53%), 3-nitroaniline (58%), 4-chloro-3-methylphenol (56%), 3-and/or 4-methylphenol (68%), 4-nitroaniline (67%), 4-nitrophenol (5%), bis(2-chloroethoxy) methane (53%), bis(2-chloroethyl) ether (63%), bis(2-chloroisopropyl) ether (64%),

fluoranthene (65%), hexachlorobutadiene (49%), hexachlorocyclopentadiene (34%), hexachloroethane (47%), isophorone (54%), naphthalene (56%), nitrobenzene (52%), pentachlorophenol (0%), and phenol (67%). Data for these analytes may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOC analysis, the MS/MSD RPDs for 1,2-dichlorobenzene (34%), 1,3-dichlorobenzene (36%), 1,4-dichlorobenzene (35%), 2,4,5-trichlorophenol (110%), 2,4,6-trichlorophenol (115%), 2,4-dichlorophenol (56%), 2,4-dimethylphenol (41%), 2,4-dimethylphenol (45%), 2,4 dinitrotoluene (36%), 2-chlorophenol (37%), 2-methylphenol (36%), 2-nitroaniline (33%), 2-nitrophenol (33%), 4,6-dinitro-2-methylphenol (38%), 3-and/or 4-methylphenol (33%), 4-nitroaniline (35%), 4-nitrophenol (144%), anthracene (33%), benzo(a)anthracene (33%), benzo(a)pyrene (31%), benzo(g,h,i)perylene (31%), benzo(k)fluoranthene (33%), bis(2-ethylhexyl)phthalate (36%), butyl benzyl phthalate (31%), carbazole (32%), chrysene (33%), dibenz(a,h)anthracene (32%), dibenzofuran (31%), diethyl phthalate (31%), di-n-butyl phthalate (32%), di-n-octyl phthalate (31%), fluoranthene (36%), hexachlorocyclopentadiene (62%), hexachloroethane (41%), indeno(1,2,3-de)pyrene (32%), n-nitrosodi-n-propylamine (32%), phenanthrene (31%), phenol (31%), and pyrene (31%) are outside of QC limits. Data for these analytes may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the PAH analysis, fluorene was detected in the method blank at twice the reporting limit. All samples in SDG K4024 had fluorene detections, including the equipment blank (J1PW33). Fluorene detections in the samples are on the same order of magnitude as the laboratory method blank, except for J1PW30, which had detections of multiple PAHs. Therefore, the fluorene detections, except for J1PW30, have been attributed to laboratory contamination. The data are usable for decision-making purposes.

In the PAH analysis, fluoranthene, fluorene, and phenanthrene were detected in the equipment blank (J1PW33). Detections were less than twice the reporting limit. Therefore, there is no significant impact to the field sample data. These data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were outside of project acceptance criteria for aluminum (990%), antimony (39.3%), calcium (150%), iron (771%), manganese (203%), and silicon (22.0%). For aluminum, calcium, 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 MS. To confirm quantitation, a post digestion spike (PDS) and serial dilution was prepared for all subject analytes. Recovery was acceptable for all analytes except for iron (68.6%). Recovery of aluminum (170%) in the laboratory reference sample was above project acceptance criteria. All aluminum, antimony, calcium, iron, manganese, and silicon data for SDG K4024 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the RPD calculated for the laboratory duplicate was above acceptance criteria for total chromium (41.8%). Elevated RPDs in environmental samples are generally

attributed to natural heterogeneities in the sample matrix. There is no indication that the analytical system was operating out of control. The data are usable for decision-making purposes.

SDG J01574

This SDG comprises four focused soil samples (J1PW34 through J1PW37) from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 excavation area. The samples were analyzed for ICP metals, mercury, PCBs, pesticides, SVOCs, PAH, VOCs, and TPH.

In the VOCs analysis, the samples were prepared after the 48-hour hold time but within twice the hold time. All data associated with these samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the VOC analysis, the LSC recovery was below QC limits for carbon disulfide (66%) and 2-hexanone. The MS recovery was below QC limits for carbon disulfide (57%), chloroethane (62%), chloromethane (68%), 2-hexanone (67%), 1,1,2,2-tetrachloroethane (68%), and vinyl chloride (63%). The MSD recovery was below QC limits for carbon disulfide (64%). All data associated with these samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the VOC analysis, methylene chloride was detected in the method blank at less than twice the reporting limit. All samples in the SDG had methylene chloride detections. Methylene chloride detections in the samples are on the same order of magnitude as the method blank. Therefore, these detections have been attributed to laboratory contamination. The data are usable for decision-making purposes.

In the SVOC analysis, bis(2-ethylhexyl)phthalate was detected in the method blank at less than twice the method detection limit (MDL). All samples in the SDG had bis(2-ethylhexyl)phthalate detections. Bis(2-ethylhexyl)phthalate detections in the samples are on the same order of magnitude as the method blank. Therefore, these detections have been attributed to laboratory contamination. The data are usable for decision-making purposes.

In the SVOC analysis, the LCS recovery was below QC limits for 4-chloroaniline (58%) and 3,3'-dichlorobenzidine (62%). The MS and MSD recoveries, respectively, were below QC limits for carbon disulfide (34% and 38%), 4-chloroaniline (55% and 59%), 3,3'dichlorobenzidine (55% and 53%), 2,4-dimethylphenol (66% for MS only), 4,6-dinitro-2-methylphenol (42% and 45%), and 2,4-dinitrophenol (27% and 30%). All data associated with these samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were outside of project acceptance criteria for aluminum (643%), antimony (55%), iron (3,374%), manganese (154%), and silicon (25%). 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 MS. All aluminum, antimony, iron, manganese, and silicon data for SDG J01574 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 18%. Estimated data are usable for decision-making purposes.

SDG KP0143

This SDG comprises two statistical (J1R505 and J1R506) and one focused (J1R507) soil samples from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 excavation area. J1R505 and J1R507 were analyzed for PAHs and J1R506 was analyzed for SVOCs.

In the SVOA analysis, surrogate recoveries were below project QC limits for sample J1R506. All data for J1R506 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOA analysis, the LCS, MS, and MSD recoveries were below QC limits for nearly all analytes. Additionally, nearly all surrogate recoveries for the MB, LCS, MS, and MSD were above QC limits. All SVOA data for SDG KP0143 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the PAH analysis, the surrogate recovery was consistently above the QC limit for the MB, LCS, MS, and MSD. All PAH data for SDG KP0143 may be considered estimated. Estimated data are acceptable for decision-making purposes.

SDG KP0169

This SDG comprises one statistical soil sample (J1R794) from the 100-N-6, 100-N-16, 100-N-98, and 128-N-1 staging pile area. J1R794 was analyzed for PAHs and SVOCs.

In the SVOA analysis, nearly all surrogate recoveries were below QC limits for SDG KP0169. All surrogate recoveries for the LCS, MS, and MSD were above QC limits. All SVOA data for SDG KP0169 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOA analysis, the LCS, MS, and MSD recoveries were outside of QC limits for nearly all analytes. The resulting MS/MSD RPD calculation for 1,3-dichlorobenzene (34%), 4-chlorophenyl phenyl ether (59%), 4-nitroaniline (60%), benzo(g,h,i)perylene (35%), diethyl phthalate (56%), fluorene (55%), and indeno(1,2,3-cd)pyrene (32%) are above QC limits. All SVOA data for SDG KP0169 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the PAH analysis, the surrogate recovery was consistently above the QC limit for the MB, LCS, MS, and MSD. The MS recoveries were above QC limits for fluoranthene (137%), pyrene (133%), and benzo(g,h,i)perylene (143%). The MS/MSD RPD was above QC limits

for acenaphthene (40%). All PAH data for SDG KP0169 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the PAH analysis, fluorene was detected in the method blank at a concentration slightly above the reporting limit. Fluorene was detected in sample J1R794 at nearly the same concentration. Therefore, the fluorene detection has been attributed to laboratory contamination. The 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 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 and WCH 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
Excavation Area	J1PW11	J1PW19
Staging Pile Area	J1PW25	J1PW32

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 five times the target detection limit. Relative percent differences of analytes detected at low concentrations (less than five 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.

All calculated RPDs for the field QA/QC samples were within 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 five times the target detection limit (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 TPH-diesel range EXT, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene duplicate sample results from the excavation area required this check. No samples 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites 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 100-N-6, 100-N-16, 100-N-98, and 128-N-1 waste sites 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 D.

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, 2006, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites,* DOE/RL-2005-92, Rev. 0, 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, 2012a, *100N Field Remediation Sampling*, Logbook EL-1652-06, pp. 70-73, Washington Closure Hanford, Richland, Washington.

WCH, 2012b, *100N Field Remediation Sampling*, Logbook EL-1652-07, pp. 60-62 and 71-75, Washington Closure Hanford, Richland, Washington.

WCH, 2012c, *100N Field Remediation Sampling*, Logbook EL-1652-08, pp. 6-7, Washington Closure Hanford, Richland, Washington.

WCH, 2012d, *Work Instruction for Verification Sampling of the 100-N-6, 128-N-1; 128N-F8-3, 100-N-16, 128M-FS-2, Burn Pit 1, 100-N-98, 100-N Stain Area #3, 128-N-1, 128 N-1 Burning Pit, 100-N Burning Pit Waste Sites,* 0100N-WI-G0049, Rev. 0, Washington Closure Hanford, Richland, Washington.