1216391

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

12-AMRP-0143

AUG 21 2012

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 FORM NO. 2012-016 AND SUPPORTING DOCUMENTATION FOR THE 100-D-8, 105-DR PROCESS SEWER OUTFALL WASTE SITE, REVISION 0

Attached for your use is the approved Waste Site Reclassification Form No. 2012-016, and supporting "Remaining Sites Verification Package for the 100-D-8, 105-DR Process Sewer Outfall Waste Site," Rev.0. If you have questions, please contact me or your staff may contact Tom Post, of my staff, at (509) 376-3232.

Sincerely,

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

AMRP:TCP

Attachment

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

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

100-DR-1

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-DR-1 **Control No.:** 2012-016

Waste Site Code(s)/Subsite Code(s): 100-D-8, 105-DR Process Sewer Outfall

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-D-8, 105-DR Process Sewer Outfall waste site is located within the 100-DR-1 Operable Unit, approximately 230 m (755 ft) upstream on the Columbia River from the 181-D Pumphouse. The outfall was used to discharge wastewater from the 183-DR and 190-DR water treatment facilities, including runoff from stormwater drains associated with the 100-D and 100-DR facilities. The outfall was built in 1949 with modifications in 1950 to increase discharge capacity. Use of the system ceased between 1965 and 1968. The outfall structure was demolished in place in 1978 and then leveled to blend in with the surrounding riverbank.

Because the 100-D-8 outfall extended into the Columbia River, the ordinary high water mark (OHWM) was used to partition the remediation of the waste site into an upland segment, located above the OHWM, and a shoreline segment, located below the OHWM. Remediation of the upland portion of the 100-D-8 waste site was initiated on September 29, 2010, and was completed on February 17, 2011. Approximately 118,440 metric tons (52,253 bulk cubic meters) of material was removed for disposal at the Environmental Restoration Disposal Facility (ERDF). Remediation, verification sampling, and backfill of the shoreline segment of the 100-D-8 waste site was performed on a single day, October 30, 2011, to preclude fish stranding due to fluctuating Columbia River flow rates. Approximately 741 metric tons (1,680 bulk cubic meters) of material was removed from the shoreline segment and disposed at ERDF.

Verification sampling of the upland segment was performed December 12 through 13, 2011; February 1, 2012; and March 12, 2012, to determine if the waste site meets the remedial action objectives (RAOs) and remedial action goals (RAGs) established by the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington (Remaining Sites 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 at the 200 Area of the Hanford Site, (3) demonstrating through verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification as Interim Closed Out.

The results of the sampling of the shoreline segment is included in the *Remaining Sites Verification Package for the 100-D-8, 105-DR Process Sewer Outfall Waste Site* (attached) and will be provided for consideration as part of the final record of decision for the 100-D Area.

Basis for reclassification:

The verification sample results for the upland segment of the 100-D-8 waste site were evaluated in comparison to the RAGs. In accordance with this evaluation, the sampling results for the 100-D-8 waste site support a reclassification of the waste site to Interim Closed Out. The current site conditions achieve the RAOs and RAGs established by the Remaining Sites ROD (EPA 1999). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The analytical results and rationale presented in the attached remaining sites verification package also demonstrate that residual contaminant concentrations meet direct exposure cleanup criteria and are protective of groundwater and the Columbia River. Therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

The sediment sample results collected within the remediated shoreline of the 100-D-8 waste site exceed soil RAGs for upland areas. However, interim action soil RAGs are not appropriately applied to sediments collected below the OWHM and the interim action ROD does not provide an in-water remedy for sediment. The sediment results exceeding upland soil RAGs are for metals concentrations that are comparable to concentrations measured at reference sites for the River Corridor Baseline Risk Assessment and for polycyclic aromatic hydrocarbons and polychlorinated biphenyls with low environmental mobility. Negotiations during Project Manager dispute initiated 2/10/2012 addressed rewetted zones and river sediment waste sites. During these negotiations, DOE agreed to specifically evaluate the 116-H-5 and related shoreline sites in the upcoming 100-D/100-H Remedial Investigation/Feasibility Study. This evaluation should include at a minimum discussions of river

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-DR-1 **Control No.:** 2012-016

Waste Site Code(s)/Subsite Code(s): 100-D-8, 105-DR Process Sewer Outfall

sediment backgrounds and specific applicability of modeling methods to soils in the periodically rewetted zone along the shoreline.

The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-D-8, 105-DR Process Sewer Outfall Waste Site* (attached).

Project Manager comments:

Approval of this WSRF documents regulator agreement that the 100-D-8 waste site qualifies for "Interim Closed Out" under this Interim Action ROD. In addition, Ecology has evaluated the data for this site against WAC 173-340 (2007) clean-up levels for direct contact, groundwater protection, and river protection. This evaluation is documented in the letter transmitting Ecology's approval of the site's interim reclassification to "Interim Closed Out."

Waste Site Controls:

Engineered Controls:	☐ Yes ☒ No	Institutional Controls:	☐ Yes ☒ No	O&M Requirements:	☐ Yes ☒ No

If any of the Waste Site Controls are checked Yes, specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents:

J. P. Neath	J P Neath	7/31/12
DOE Federal Project Director (printed)	Signature	Date
N. Menard	Nina M. Menard	8/2/12
Ecology Project Manager (printed)	Signature	Date
N/A		
EPA Project Manager (printed)	Signature	Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-D-8, 105-DR PROCESS SEWER OUTFALL WASTE SITE

Attachment to Waste Site Reclassification Form 2012-016

August 2012

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-D-8, 105-DR PROCESS SEWER OUTFALL WASTE SITE

EXECUTIVE SUMMARY

The 100-D-8, 105-DR Process Sewer Outfall waste site, located in the 100-DR-1 Operable Unit, is the location of a former emergency discharge spillway for wastewater from the 105-DR Reactor and for stormwater and process discharges from the 183-DR and 190-DR water treatment facilities. The outfall structure historically consisted of a concrete box flume that discharged to grouted riprap. The grouted riprap extended into the Columbia River approximately 13.1 m (43 ft) beyond the end of the spillway. The outfall structure was demolished and covered in 1978. After demolition, the site existed as the covered remains of the former outfall embankment and spillway that extending from the top of the river embankment into the Columbia River.

Confirmatory sampling of the 100-D-8 outfall was not practical due to its location on the embankment of the Columbia River. Because the 100-D-8 outfall was supplied by the 100-D-50 pipelines, the remedial action decision for the waste site was based upon the results of confirmatory sampling of 100-D-50:1, the pipelines that connected directly to the outfall.

The 100-D-8 waste site consists of two components: an upland segment located above the Columbia River ordinary high water mark (OHWM) and a shoreline segment located below the OHWM and above the ordinary low water mark (OLWM). Remediation of the upland segment of the outfall was performed consistent with existing protocols specified in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP) (DOE-RL 2009b). Remediation, verification sampling, and backfill of the below OHWM segment of the waste site was performed October 30, 2011, during low Columbia River flows, as agreed to with the Washington State Department of Ecology (Ecology) to preclude fish stranding due to fluctuating Columbia River flow rates.

Remediation of the upland segment of the 100-D-8 waste site was performed from September 29, 2010 through February 17, 2011. In late March 2011, additional soil was removed at the base of the excavation in the area where four in-process soil samples indicated residual contamination exceeding cleanup criteria. On May 18, 2011, high Columbia River flows resulted in river water entering the excavation and presenting a potential fish-stranding hazard to juvenile fish. With Ecology approval, fill material was temporarily placed into the low areas of the excavation until such time that river flows were sufficiently low to resume excavation. In early December 2011, this fill material was removed and the remediation completed. Approximately 118,440 metric tons (52,253 bank cubic meters) of material was excavated, stockpiled, and later disposed at the Environmental Restoration Disposal Facility (ERDF).

Remediation, verification sampling, and backfill of the shoreline area of the spillway was performed on a single day, October 30, 2011, to preclude fish stranding due to fluctuating Columbia River flow rates. Approximately 741 metric tons (1,680 bank cubic meters) of

material was removed from the shoreline area and disposed at ERDF. Maximum contaminant concentrations for sediment samples collected within the remediated shoreline area exceed upland soil remedial action goals (RAGs) for cadmium, chromium, copper, lead, manganese, mercury, vanadium, zinc, benzo(a)anthracene, benzo(b)pyrene, benzo(b)fluoranthene, and chrysene. However, no further remediation of the shoreline area is recommended since interim action soil RAGs are not appropriately applied to sediments collected below the OHWM and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999) does not provide an in-water remedy for sediment. The sediment results exceeding upland soil RAGs are for metals concentrations that are comparable to concentrations measured at reference sites for the River Corridor Baseline Risk Assessment (WCH 2006a, 2006b) and for polycyclic aromatic hydrocarbons with low environmental mobility. Negotiations during Project Manager dispute initiated 2/10/2012 addressed rewetted zones and river sediment waste sites. During these negotiations, DOE agreed to specifically evaluate the 116-H-5 and related shoreline sites in the upcoming 100-D/100-H Remedial Investigation/Feasibility Study. This evaluation should include at a minimum discussions of river sediment backgrounds and specific applicability of modeling methods to soils in the periodically rewetted zone along the shoreline.

Verification sampling of the upland segment of the soil within the excavation was conducted on December 12, 2011, and verification sampling of the overburden/layback soil was performed on December 13, 2011. Verification samples within the footprint of the waste staging pile areas were collected on February 1, 2012, and March 12, 2012. The results indicated that the waste removal action achieved compliance with the remedial action objectives (RAOs) for the 100-D-8 waste site. A summary of the cleanup evaluation for the soil results against the applicable criteria is presented in Table ES-1. The results of the verification sampling are used to make reclassification decisions for the 100-D-8 waste site in accordance with the *Tri-Party Agreement Handbook Management Procedures,* TPA-MP-14 procedure (DOE-RL 2011).

In accordance with this evaluation, the verification sampling results support a reclassification of this site to Interim Closed Out with the understanding that the DOE has agreed to evaluate shoreline sites and river sediments in the upcoming 100-D/H Feasibility Study. For the upland portion of the site, the current site conditions achieve the RAOs and the corresponding RAGs established in the 100 Area RDR/RAWP (DOE-RL 2009b) and the Remaining Sites ROD (EPA 1999). The results of verification sampling for the upland segment 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 for the upland segment also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. The upland segment of the site does not have residual contaminant concentrations that would require any institutional controls.

Table ES-1. Summary of Remedial Action Goals for the Upland Segment of the 100-D-8 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain 15 mrem/yr dose rate above background over 1,000 years.	Maximum dose rates from sum-of-fractions evaluations for the shallow zone decision units (i.e., excavation, overburden/layback and waste staging area footprint) using dose-equivalent lookup values are all less than 15 mrem/yr. The maximum cumulative dose rate for the waste site is 2.20 mrem/yr.	Yes
Direct Exposure – Nonradionuclides	Attain individual COC/COPC RAGs.	All detected COCs/COPCs were quantified below the direct exposure RAGs.	Yes
Risk Requirements – Nonradionuclides	Attain a hazard quotient of less than 1 for all individual noncarcinogens.	All individual hazard quotients are less than 1.	Yes
	Attain a cumulative hazard quotient of less than 1 for noncarcinogens.	The cumulative hazard quotient (2.3×10^{-3}) is less than 1.	
	Attain an excess cancer risk of less than 1×10^{-6} for individual carcinogens.	All individual carcinogens are less than 1×10^{-6} cancer risk.	
	Attain a cumulative excess cancer risk of less than 1×10^{-5} for carcinogens.	The excess cancer risk (1.2×10^{-6}) is less than 1×10^{-5}.	
Groundwater/River Protection – Radionuclides	Attain single-COC/COPC groundwater and river protection RAGs.	With the exception of technetium-99, radionuclide COPCs were not quantified at activities above groundwater/river protection lookup values [a].	Yes
	Attain national primary drinking water standards [b]: 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.	With the exception of technetium-99 radionuclide COPCs were not quantified at activities above groundwater/river protection lookup values [a].	
	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 [c].	No alpha-emitting radionuclide COPC were quantified above groundwater/river protection lookup values.	
	Meet total uranium standard of 30 µg/L (21.2 pCi/L) [d].	Uranium was not quantified above background levels for this site.	

Table ES-1. Summary of Remedial Action Goals for the Upland Segment of the 100-D-8 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	Residual concentrations of several polycyclic aromatic hydrocarbons were detected in the waste staging pile footprint at concentrations exceeding the soil RAGs for 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 criteria within 1,000 years [e]. Therefore, residual concentrations achieve the RAOs for groundwater and river protection.	Yes

[a] Technetium-99 was detected within the excavation at an activity (0.472 pCi/g) slightly above the soil lookup value (0.46 pCi/g) for groundwater protection. Since the soil lookup value for protection of groundwater is conservatively modeled using an area of contamination of 10,000 m^2 (DOE-RL 2009b) and the excavation has a much smaller area of 750 m^2, it is believed that residual technetium-99 contamination within the excavation will not result in unacceptable contamination of groundwater above the MCL.

[b] "National Primary Drinking Water Regulations" (40 *Code of Federal Regulations* 141).

[c] *Radiation Protection of the Public and the Environment* (DOE Order 5400.5).

[d] 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).

[e] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene are not predicted to migrate because all of these contaminants have distribution coefficient (K_d) values greater than 80 mL/g. RESRAD modeling predicts that contaminants with K_d values greater than 80 mL/g will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River within 1,000 years. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River.

COC = contaminant of concern
COPC = contaminant of potential concern
MCL = maximum contaminant level
NA = not applicable
RAG = remedial action goal
RAO = remedial action objective
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 100-D-8 waste site contaminants of concern, contaminants of potential concern, and other constituents and is presented in Appendix D. The U.S. Environmental Protection Agency ecological soil screening levels were exceeded for antimony, manganese, vanadium, and zinc. Ecological screening levels from *Washington Administrative Code* 173-340 were exceeded for boron and vanadium. A summary table showing the maximum contaminant concentration for constituents that exceed ecological screening levels for the 100-D-8 waste site is provided in Appendix A. Because concentrations of antimony, manganese, vanadium, and zinc are below Hanford Site (DOE-RL 2001) or Washington State (Ecology 1994) background values (note that state background values are only used when Hanford Site background values are not available), it is believed that the presence of

these constituents does not pose a risk to ecological receptors. No established background values are available for boron; a final cleanup level for boron, including consideration of background, will be established through the final remedial investigation/feasibility study process. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. All exceedances, will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for the Columbia River corridor portion of the Hanford Site.

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-D-8, 105-DR PROCESS SEWER OUTFALL WASTE SITE

STATEMENT OF PROTECTIVENESS

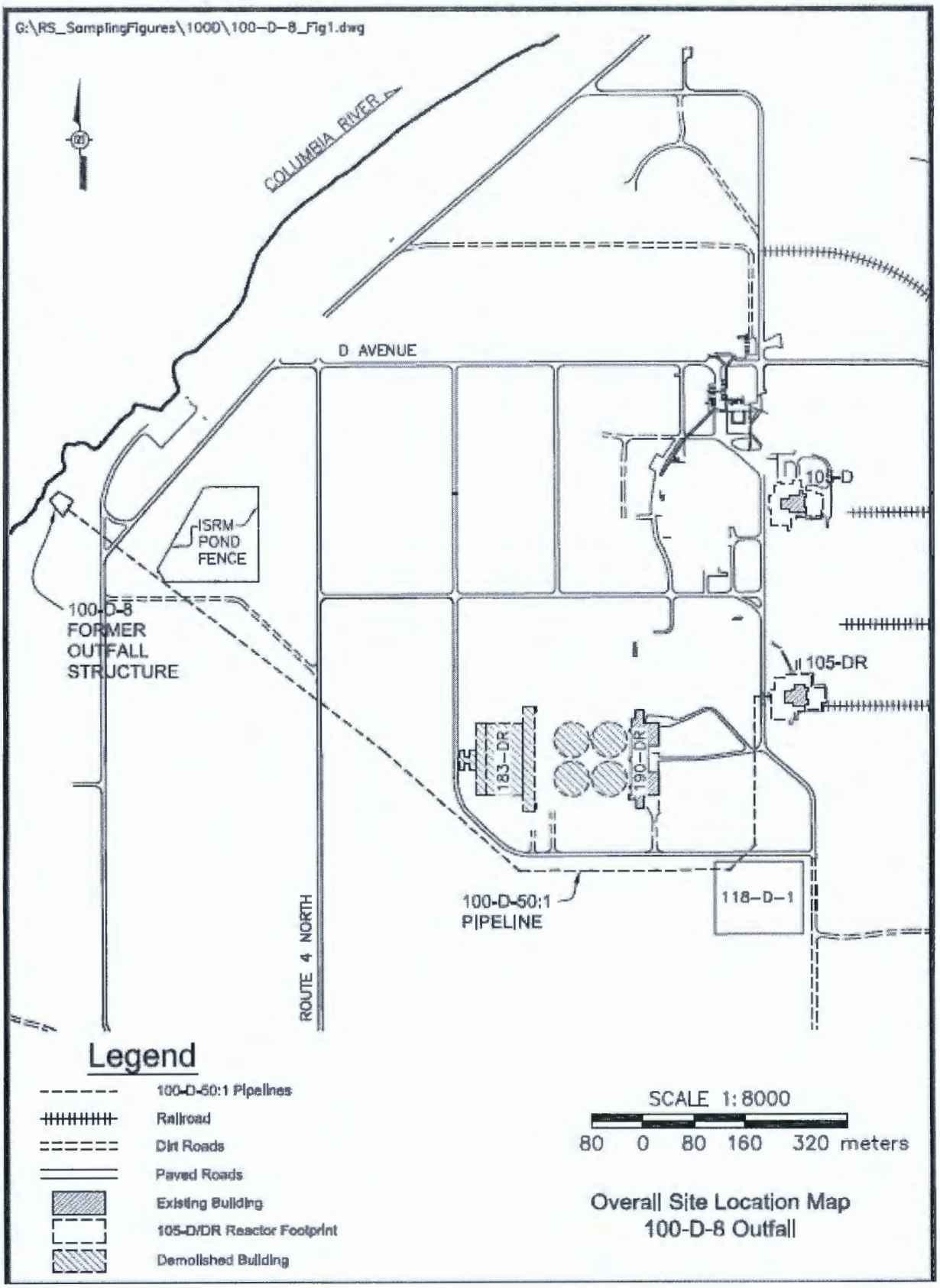
This report demonstrates that the 100-D-8, 105-DR Process Sewer Outfall waste site meets the objectives for interim closure as established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP) (DOE-RL 2009b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are sufficiently protective of groundwater and the Columbia River. Institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 100-D-8 waste site contaminants of concern (COCs), contaminants of potential concern (COPCs), and other constituents and is presented in Appendix A. The U.S. Environmental Protection Agency (EPA) ecological soil screening levels were exceeded for antimony, manganese, vanadium, and zinc. Ecological screening levels from *Washington Administrative Code* (WAC) 173-340 were exceeded for boron and vanadium. A summary table showing the maximum contaminant concentration for constituents that exceed ecological screening levels for the 100-D-8 waste site is provided in Appendix A. Because concentrations of antimony, manganese, vanadium, and zinc are below Hanford Site (DOE-RL 2001) or Washington State (Ecology 1994) background values (note that state background values are only used when Hanford Site background values are not available), it is believed that the presence of these constituents does not pose a risk to ecological receptors. No established background values are available for boron; a final cleanup level for boron, including consideration of background, will be established through the final remedial investigation/feasibility study process. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. All exceedances, will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for the Columbia River corridor portion of the Hanford Site.

GENERAL SITE INFORMATION AND BACKGROUND

The 100-D-8, 105-DR Process Sewer Outfall waste site is located within the 100-DR-1 Operable Unit approximately 230 m (755 ft) upstream on the Columbia River from the 181-D Pumphouse (Figure 1), at Washington State Plane coordinates E 572613.0, N 151594.6.

Figure 1. 100-D-8 Waste Site Location Map.



The 105-DR Process Sewer Outfall was used to discharge wastewater from the 183-DR and 190-DR water treatment facilities, including runoff from stormwater drains associated with the 100-D Area cask pad and 100-DR facilities (*100-D Area Technical Baseline Report* [Carpenter 1993]). According to the Waste Information Data System (WIDS), construction of the 105-DR outfall was completed in 1949 with modifications made in 1950 to increase the discharge capacity. Operational use of the sewer and outfall began in 1950, although the frequency, volume, or nature of any discharges to the sewer from the 105-DR Reactor is unknown. Use of the system ceased between 1965 and 1968. The outfall structure was demolished using a wrecking ball in 1978, and the area was then covered and leveled to blend in with the surrounding riverbank. Figure 2 is a photograph of the outfall prior to demolition, and Figure 3 shows the outfall after demolition of the structures.

Site Geophysical Survey Information

A geophysical survey was performed at the 100-D-8 waste site in June 2004 (Bergstrom and Mitchell 2004) to locate buried remnants of the demolished outfall structure and map existing surface features. The survey was conducted using magnetometry and electromagnetic induction, but was limited by the steep slope of the river embankment. Figure 4 shows the interpreted geophysical survey results. Within the surveyed areas, no subsurface features were located, with the exception of a magnetic anomaly southeast of the former outfall structure and beyond the WIDS boundaries (Figure 4).

REMEDIAL ACTION SUMMARY

Because the spillway extended into the Columbia River, the ordinary high water mark (OHWM) was used to partition the remediation of the waste site into an upland segment, located above the OHWM, and a shoreline segment, located below the OHWM. The remedial design for the outfall structure was approved by the Washington State Department of Ecology (Ecology). Remediation of the outfall was performed consistent with protocols as specified in the 100 Area RDR/RAWP (DOE-RL 2009b). Figure 5 is a photograph of the site prior to remediation, and Figure 6 shows the site after remediation.

Figure 2. Photograph of the 100-D-8 Outfall, Taken Prior to Demolition (1978).

Figure 3. Photograph of the 100-D-8 Outfall, After Demolition Activities (August 2005).

Figure 4. Interpreted Geophysical Survey Results for the 100-D-8 Waste Site.

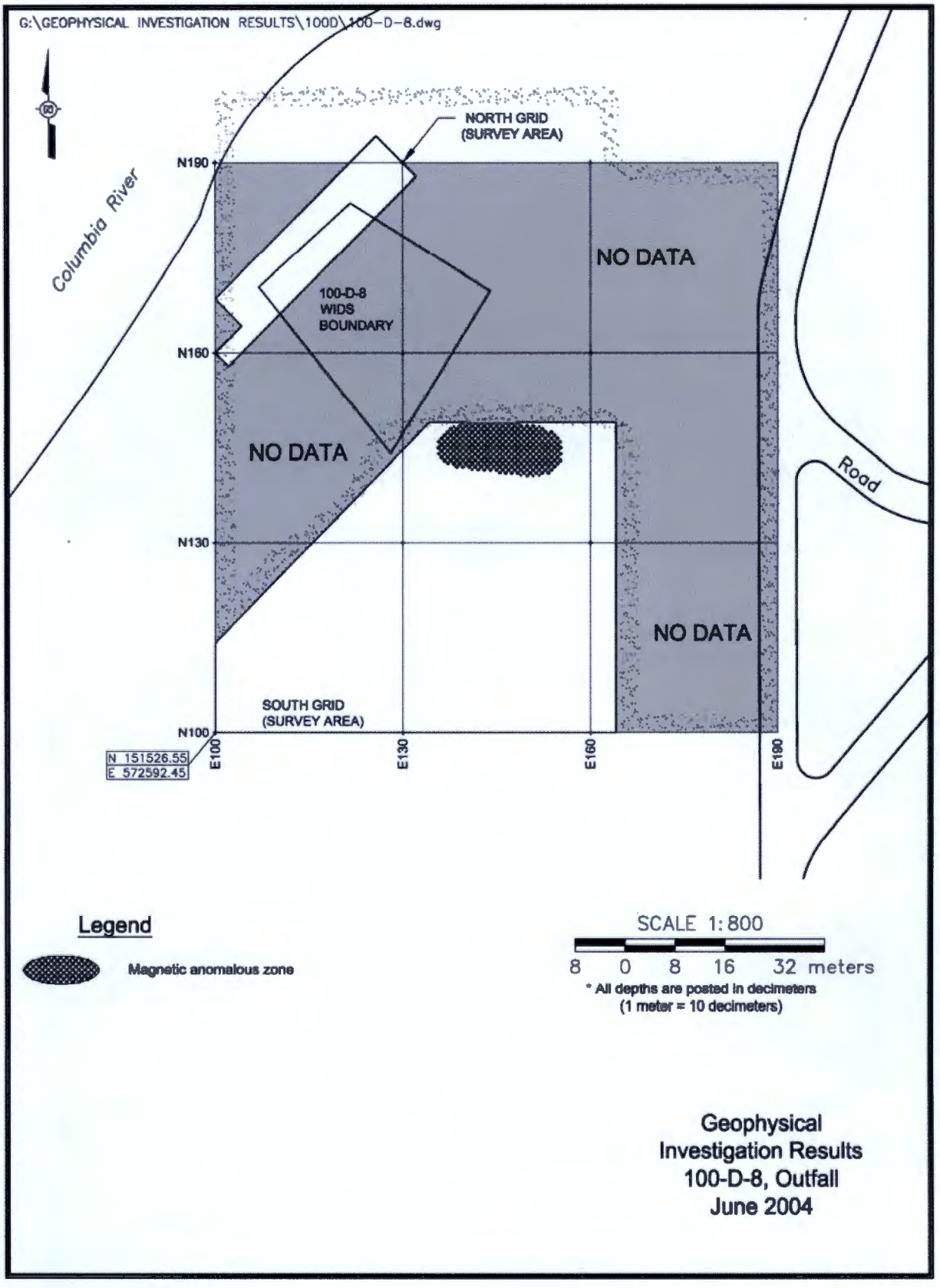
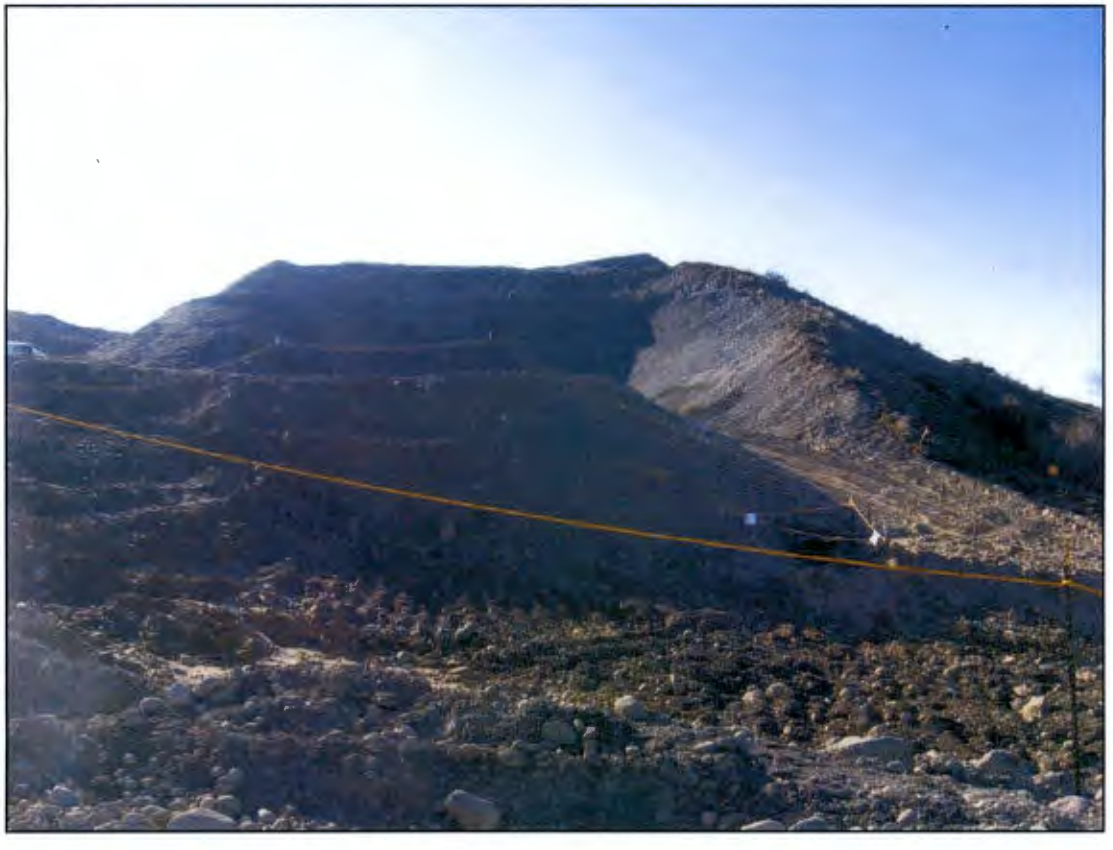


Figure 5. Photograph of the 100-D-8 Waste Site Prior to Remediation (2005).

Figure 6. Photograph of the 100-D-8 Waste Site after Remediation (2011).



Remedial action of the upland segment of the 100-D-8 waste site was performed from September 29, 2010, through February 17, 2011. In late March 2011, additional soil was removed at the base of the excavation in the area where four in-process soil samples indicated that lead, zinc, and/or polyaromatic hydrocarbons (PAH) were present at concentrations exceeding cleanup criteria for protection of groundwater and the Columbia River. The results of this sampling are provided in Appendix B and indicated that residual contamination exceeding cleanup criteria was still present. On May 18, 2011, high Columbia River flows resulted in river water entering the excavation and presenting a potential stranding hazard to juvenile fish (Figure 7). With Ecology approval, fill material was placed into the low areas of the excavation. This material was subsequently removed, along with additional contaminated soil, from the base of the excavation prior to proceeding with verification soil sampling of the excavation on December 12, 2012. Approximately 118,440 metric tons (52,253 bank cubic meters) of material was removed from the upland segment of the 100-D-8 waste site for disposal at the Environmental Restoration Disposal Facility (ERDF).

Figure 7. Photograph of River Water Entering the 100-D-8 Excavation (May 2011).

Remediation, verification sampling, and backfill of the shoreline segment was performed on a single day, October 30, 2011, to preclude fish standing. Approximately 1,680 metric tons (741 bank cubic meters) of material was removed from the shoreline segment and disposed at ERDF. The results of the verification sampling of the shoreline segment are provided in Appendix C.

Several in-process samples were collected to support waste characterization and designation. A sample of the inline pipeline contents (J1CD79, J1CD80) and one of underlying soil (J1CD81) were collected on October 26, 2010 (Figure 8). Soil samples were also collected from waste staging piles to support waste characterization. The results of this sampling are provided in Appendix B. During excavation, one anomaly, a metal box, was discovered (Figure 9) at Washington State Plane coordinates N 151596.7, E 572626.3. The anomaly was moved out of the excavation to an area reserved for characterization of the anomaly.

Figure 8. Photograph of the 72-inch Concrete Outfall Pipeline.

Figure 9. Photograph of the Metal Box Anomaly Found at the 100-D-8 Waste Site During Remediation.

Post-excavation Global Positioning Environmental Radiological Surveyor (GPERS) surveys were conducted in January and February 2011. The results of these surveys are provided in Appendix D and do not indicate the presence of radiological contamination.

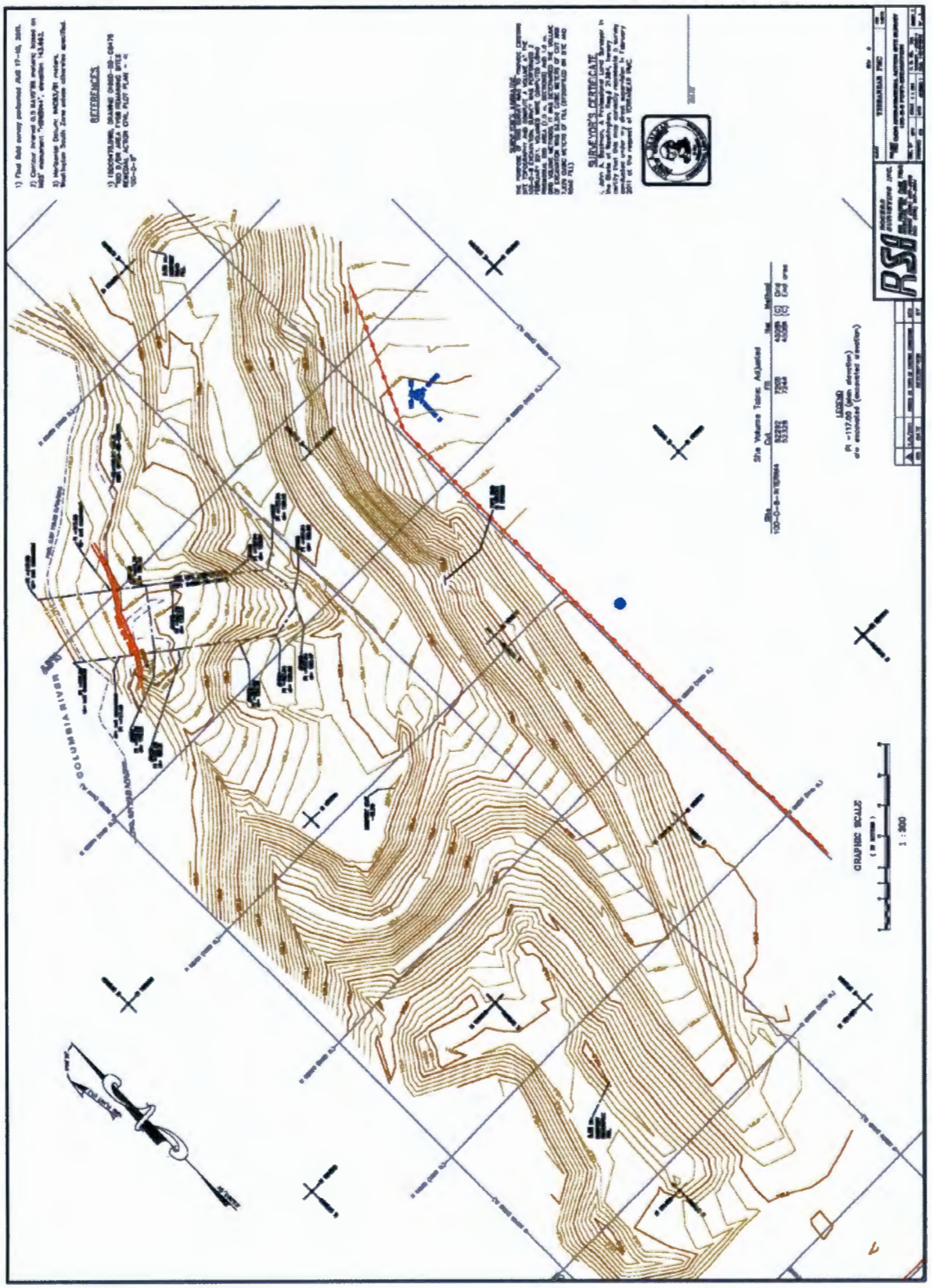
A post-excavation civil survey for the 100-D-8 waste site is provided in Figure 10.

VERIFICATION SAMPLING ACTIVITIES

Verification sampling of the excavation and the overburden/layback soil stockpiles for the upland segment of the 100-D-8 waste site was performed on December 12 and 13, 2011. Verification sampling of the footprints of the waste staging pile areas was performed on February 1, 2012, and then again on March 12, 2012, after two sample locations within the waste staging pile footprints were found to have residual pentachlorophenol concentrations exceeding cleanup criteria that required additional soil removal. Verification sampling was performed to support a determination that residual contaminant concentrations at this site meet the cleanup criteria specified in the 100 Area RDR/RAWP (DOE-RL 2009b) and the Remaining Sites ROD (EPA 1999). The verification sample results are provided in Appendix E.

Verification sampling of the shoreline segment was performed on October 30, 2011. The results of this sampling are provided in Appendix C and will be considered as part of the final action evaluation for this waste site.

Figure 10. Post-Excavation Civil Survey Drawing for the Upland Portion of the 100-D-8 Waste Site.



The following subsections provide additional discussion of the information used to develop the verification sampling design. A more detailed discussion of the verification sample design for the upland segment of the outfall can be found in the *Work Instruction for Verification Sampling of the Upland Portion of the 100-D-8, 105-DR Process Sewer Outfall Waste Site* (WCH 2011b). Discussion of the verification sampling design for the shoreline segment is provided in the *Work Instruction for Verification Sampling of the 100-D-8, 105-DR Process Sewer Outfall Site Below the Ordinary High Water Mark* (WCH 2010).

Contaminants of Concern and Contaminants of Potential Concern

The COPCs for the 100-D-8 outfall structure specified in the 100 Area RDR/RAWP (DOE-RL 2009b) were identified as americium-241, carbon-14, cobalt-60, cesium-137, europium-152, europium-154, europium-155, tritium, nickel-63, strontium-90, uranium-234, uranium-235, uranium-238, plutonium-238, plutonium-239/240, total chromium, lead, hexavalent chromium, and mercury. Based on the confirmatory sample results for the 100-D-50:1 pipeline that discharged to the 100-D-8 outfall, antimony, arsenic, boron, cadmium, cobalt, copper, manganese, molybdenum, nickel, zinc, polychlorinated biphenyls (PCB), PAH, semivolatile organic compounds, and pesticides were included as COPCs. Tritium and technetium-99 were included as they are listed as COPCs in the River Corridor Closure Contract Stewardship Information System. Although not considered COPCs, barium, beryllium, selenium, silver, and vanadium were evaluated by performing analyses for the constituents of the expanded inductively coupled plasma metals lists.

A summary of all the contaminants analyzed is provided in Table 1.

Table 1. 100-D-8 Laboratory Analytical Methods. (2 Pages)

Analytical Method	Contaminants of Potential Concern
ICP metals – EPA Method 6010	Antimony, arsenic, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, zinc [a]
Mercury – EPA Method 7471	Mercury
Hexavalent chromium – EPA Method 7196	Hexavalent chromium
GEA – Gamma spectroscopy	Americium-241, cobalt-60, cesium-137, europium-152, europium-154, europium-155
Sr-90 – Liquid scintillation counting	Strontium-90
Isotopic uranium	Uranium-234, uranium-235, uranium-238
Isotopic plutonium	Plutonium-238, plutonium-239/240
Ni-63 – Liquid scintillation counting	Nickel-63
C-14 – Liquid scintillation counting	Carbon-14
Tc-99 – Liquid scintillation counting	Technetium-99
Tritium – Liquid scintillation counting	Tritium
PCB – EPA Method 8082	Polychlorinated biphenyls
SVOA – EPA Method 8270	Semivolatile organic compounds
PAH – EPA Method 8310 [b]	Polycyclic aromatic hydrocarbons

Table 1. 100-D-8 Laboratory Analytical Methods. (2 Pages)

Analytical Method	Contaminants of Potential Concern
Pesticides – EPA Method 8081	Pesticides

[a] The expanded list of ICP metals will be performed to include barium, beryllium, selenium, silver, and vanadium in the analytical results package.

[b] Because EPA Method 8310 is specifically meant to analyze for PAH, data from this method was used preferentially over the EPA Method 8270 data for evaluation of PAH analyses.

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
ICP = inductively coupled plasma
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis

Verification Sample Design

Two separate sample designs were developed for the 100-D-8 waste site: one for the upland segment (WCH 2011b) and another for the shoreline segment (WCH 2010). Three decision units were identified for the upland segment of the 100-D-8 waste site: the excavation footprint located below the outfall and spillway; the overburden/layback soil piles; and the footprint of the waste staging piles. Twelve statistical soil samples were collected from each of these decision units. All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2009a). Additional information related to verification sampling can be found in the field sampling logbook (WCH 2011a).

A focused sampling design was used to characterize the sediment after remediation of the shoreline segment. The footprint of the excavation in this area was divided into 4 segments that paralleled the shoreline of the river, with 3 discrete soil samples collected from within each segment, for a total of 12 samples.

The verification samples for the upland segment are shown in Figures 11 through 13 and the sample locations are listed in Table 2. Sediment sample locations for the shoreline segment are provided in Appendix C.

Verification Sampling Results

Verification samples were analyzed using EPA-approved analytical methods. The laboratory-reported verification data results for all constituents are stored in the Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and are presented as Attachment 1 of the 95% upper confidence limit (UCL) calculation (Appendix E). The results for the shoreline segment are provided in Appendix C. A review of the verification sampling results indicated pentachlorophenol contamination exceeding remedial action goals (RAGs) was present at two sample locations (C-1 and C-3) in the footprint of the waste staging pile area. Therefore, an additional 0.3 m (1 ft) of soil was removed in these areas and the locations were resampled.

Figure 11. Location of Excavation, Overburden/Layback, and Waste Staging Pile Footprint Sample Areas.

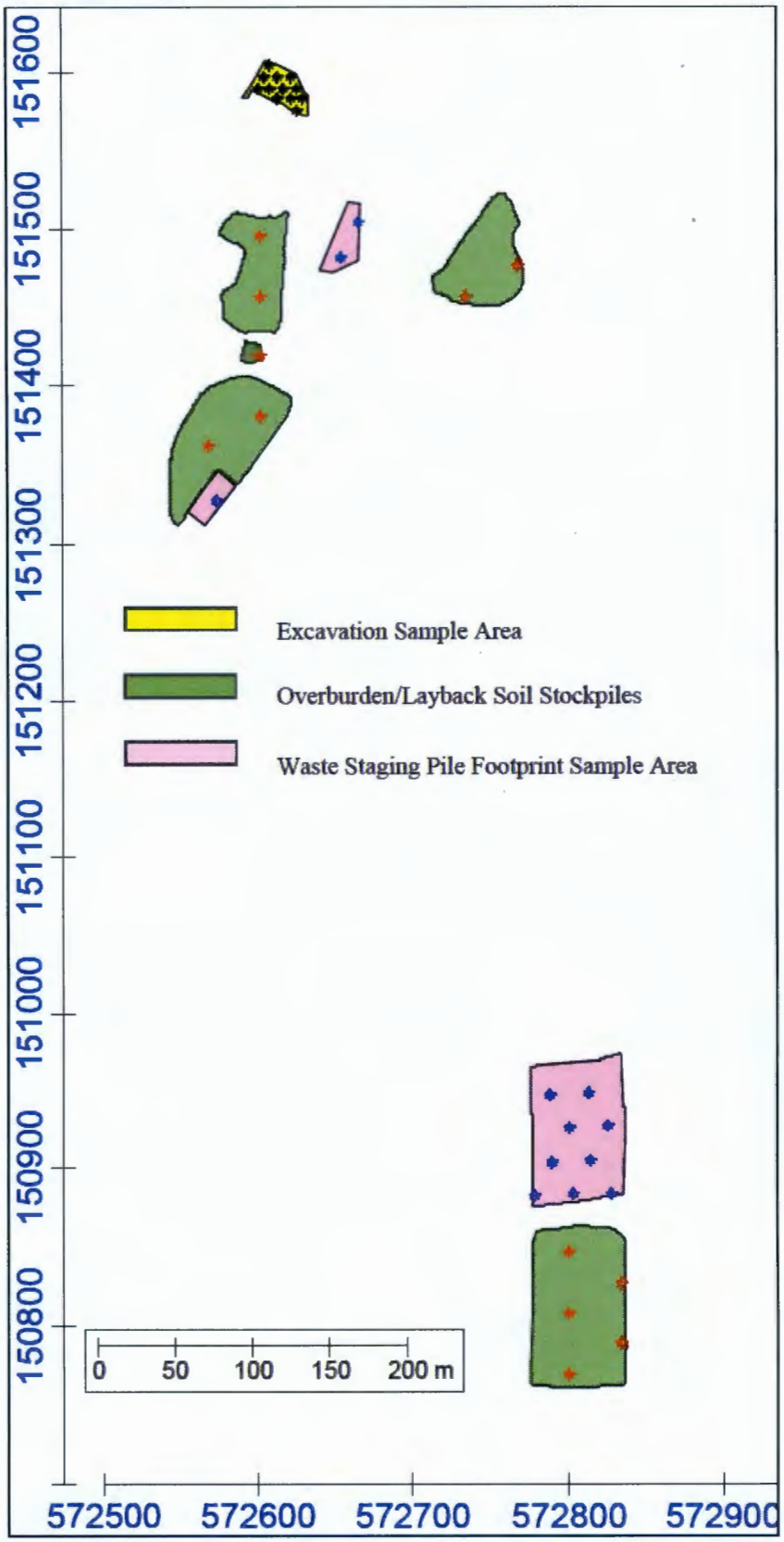


Figure 12. Location of Verification Samples for the North Portion of the 100-D-8 Waste Site.

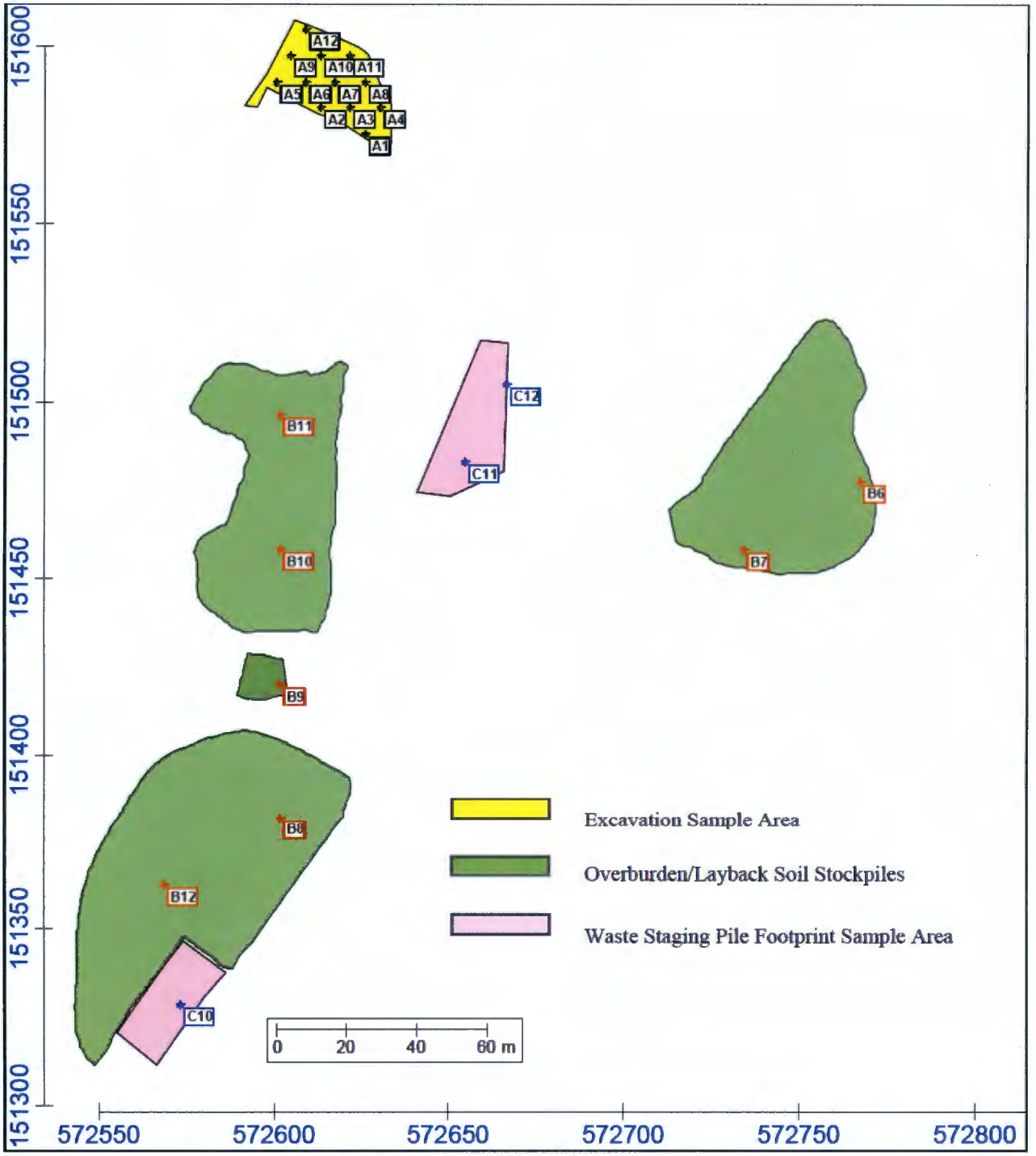


Figure 13. Location of Verification Samples for South Portion of the 100-D-8 Waste Site.

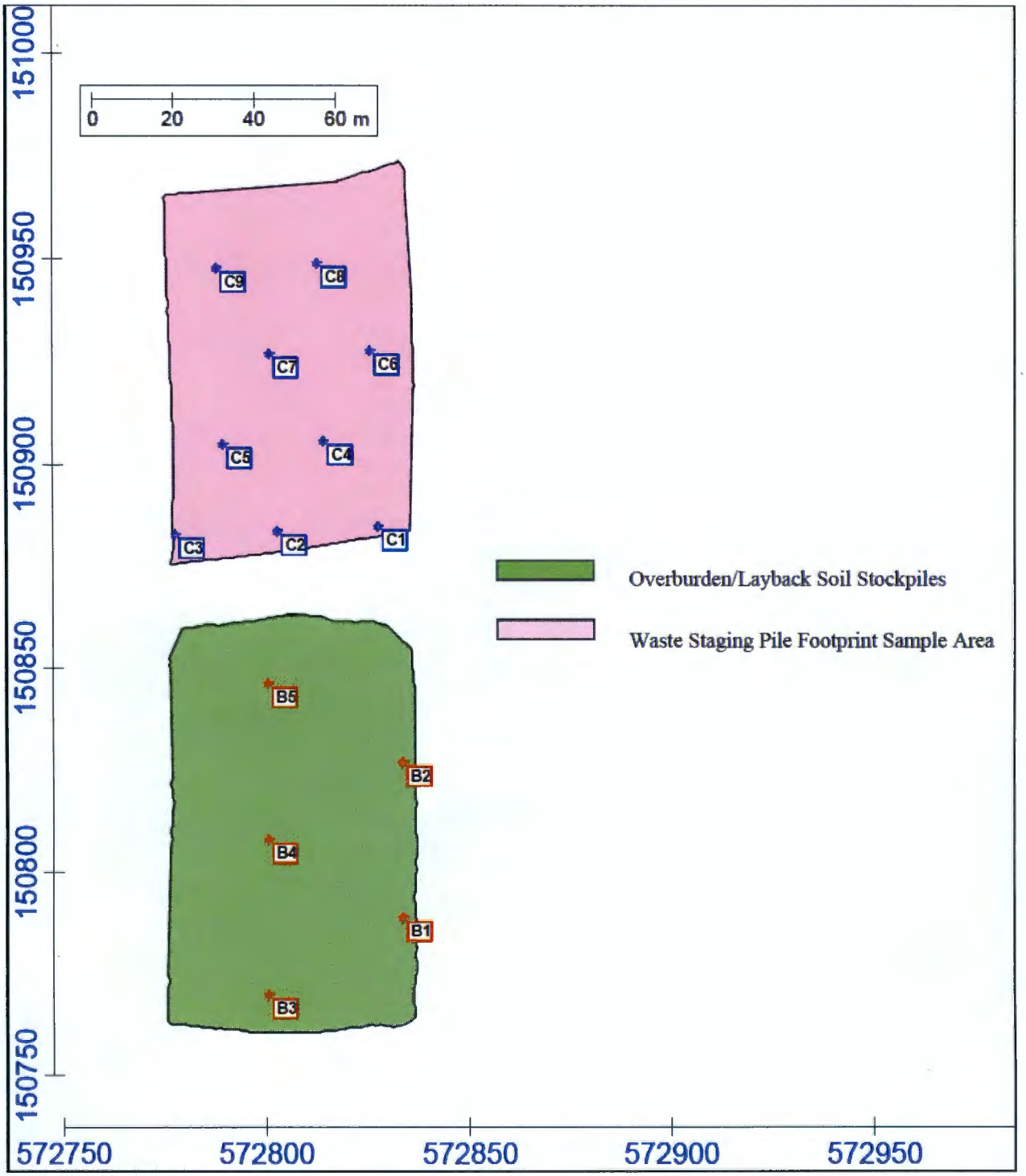


Table 2. 100-D-8 Verification Sample Summary Table (Upland Segment). (2 Pages)

Sample Location	HEIS Sample Number	Sample Date	Washington State Plane Coordinates		Sample Analysis
			Northing	Easting	
A-1	J1MXW2	12/12/11	151575.9	572625.8	ICP metals [a], mercury, hexavalent chromium, GEA, strontium-90, isotopic plutonium, isotopic uranium, nickel-63, carbon-14, technetium-99, tritium, PCB, pesticides, PAH, and SVOA
A-2	J1MXW3	12/12/11	151583.2	572613.1	
A-3	J1MXW4	12/12/11	151583.2	572621.5	
A-4	J1MXW5	12/12/11	151583.2	572630.0	
A-5	J1MXW6	12/12/11	151590.5	572600.4	
A-6	J1MXW7	12/12/11	151590.5	572608.9	
A-7	J1MXW8	12/12/11	151590.5	572617.3	
A-8	J1MXW9	12/12/11	151590.5	572625.8	
A-9	J1MXX0	12/12/11	151597.8	572604.6	
A-10	J1MXX1	12/12/11	151597.8	572613.1	
A-11	J1MXX2	12/12/11	151597.8	572621.5	
A-12	J1MXX3	12/12/11	151605.1	572608.9	
Duplicate of J1MXX1	J1MXX4	12/12/11	151597.8	572613.1	
B-1	J1N006	12/13/11	150789.2	572833.7	
B-2	J1N007	12/13/11	150827.4	572833.7	
B-3	J1N008	12/13/11	150770.0	572800.5	
B-4	J1N009	12/13/11	150808.3	572800.5	
B-5	J1N010	12/13/11	150846.5	572800.5	
B-6	J1N011	12/13/11	151477.5	572767.4	
B-7	J1N012	12/13/11	151458.4	572734.3	
B-8	J1N013	12/13/11	151381.9	572601.8	
B-9	J1N014	12/13/11	151420.1	572601.8	
B-10	J1N015	12/13/11	151458.4	572601.8	
B-11	J1N016	12/13/11	151496.6	572601.8	
B-12	J1N017	12/13/11	151362.8	572568.7	
Duplicate of J1N015	J1N018	12/13/11	151458.4	572601.8	
C-1 (resample)	J1NLP4	3/12/12	150884.8	572827.6	
C-2	J1N3V5	2/1/12	150883.9	572802.7	
C-3 (resample)	J1NLP5	3/12/12	150905.9	572814.3	
C-4	J1N3V7	2/1/12	150928.0	572825.9	
C-5	J1N3V8	2/1/12	150882.9	572777.8	
C-6	J1N3V9	2/1/12	150904.9	572789.4	
C-7	J1N3W0	2/1/12	150927.0	572801.0	
C-8	J1N3W1	2/1/12	150949.0	572812.6	
C-9	J1N3W2	2/1/12	150948.1	572787.7	
C-10	J1N3W3	2/1/12	151328.6	572573.4	
C-11	J1N3W4	2/1/12	151483.0	572654.7	
C-12	J1N3W5	2/1/12	151505.0	572666.3	
Duplicate of J1N3V9	J1N3W6	2/1/12	150904.9	572789.4	

Table 2. 100-D-8 Verification Sample Summary Table (Upland Segment). (2 Pages)

Sample Location	HEIS Sample Number	Sample Date	Washington State Plane Coordinates		Sample Analysis
			Northing	Easting	
Equipment blank	J1N019	12/13/11	NA	NA	ICP metals[a], mercury

[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.

GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TBD = to be determined

The 95% UCLs on the true population means for residual concentrations of COCs and COPCs were calculated for the excavation, the overburden/layback soil piles, and the waste staging pile footprint as specified by the 100 Area RDR/RAWP (DOE-RL 2009b), with calculations provided in Appendix E. When a nonradionuclide COC or COPC was detected in fewer than 50% of the verification samples collected for the area, the maximum detected value was used for comparison to RAGs. If no detections for a given COC/COPC were reported in the data set, then no statistical evaluation or calculations were performed for that COC/COPC.

Comparisons of the statistical and maximum results for the COPCs against the site RAGs for the excavation, the overburden/layback soil piles, and the waste staging pile footprint are summarized in Tables 3 through 5, respectively. Contaminants that were not detected by laboratory analysis are excluded from these tables but are reported in Appendix E. Calculated cleanup levels are not presented in the Cleanup Levels and Risk Calculations database (Ecology 2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COPCs and are not included in these tables. The laboratory-reported data results for all constituents are stored in the ENRE project-specific database prior to provision to HEIS and are presented as an attachment to the statistical calculations in Appendix E.

CLEANUP VERIFICATION DATA EVALUATION

This section demonstrates that remedial action at the 100-D-8 waste site has achieved the applicable RAGs developed to support unrestricted land use at the 100-D Area as documented in the 100 Area RDR/RAWP (DOE-RL 2009b).

Table 3. Comparison of the Maximum or Statistical Contaminant Concentrations to Action Levels for the 100-D-8 Excavation Verification Samples.

COPC	Statistical Result [b] (pCi/g)	Soil Lookup Values (pCi/g) [a]			Does the Result Exceed Lookup Values?	Do the Results Pass RESRAD Modeling?
		Shallow Zone Lookup Value	Soil Lookup Value for Groundwater Protection	Soil Lookup Value for River Protection		
Thorium-230	0.195	2.96	-- [c]	-- [c]	No	--
Technetium-99	0.472 pCi/g	5.8	0.46	0.92	Yes	-- [d]
Tritium	0.0149	459	12.6	25.2	No	--
Uranium-234	0.375 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--
Uranium-238	0.356 (<BG)	1.1 [e]	1.1 [e]	1.1 [e]	No	--
COPC	**Statistical or Maximum Result (mg/kg) [b]**	**Soil Cleanup Levels (mg/kg) [a]**			**Does the Result Exceed RAGs?**	**Does the Result Pass RESRAD Modeling?**
		Direct Exposure	Protective of Groundwater	Protective of the River		
Antimony	1.3	32	5 [e]	5 [e]	No	--
Arsenic	2.7 (<BG)	20 [e]	20 [e]	20 [e]	No	--
Barium	62.9 (<BG)	5,600	200	400	No	--
Beryllium	0.034 (<BG)	10.4 [f]	1.51 [e]	1.51 [e]	No	--
Cadmium [g]	0.063 (<BG)	13.9 [f]	0.81 [e]	0.81 [e]	No	--
Chromium, total	9.0 (<BG)	80,000	18.5 [e]	18.5 [e]	No	--
Cobalt	7.6 (<BG)	24	15.7 [e]	-- [h]	No	--
Copper	14.5 (<BG)	2,960	59.2	22.0 [d]	No	--
Lead	4.4 (<BG)	353	10.2 [e]	10.2 [d]	No	--
Manganese	289 (<BG)	3,760	512 [e]	512 [d]	No	--
Mercury	0.015 (<BG)	24	0.33 [e]	0.33 [d]	No	--
Nickel	11.8 (<BG)	1,600	19.1 [e]	27.4	No	--
Vanadium	55.2 (<BG)	560	85.1 [e]	-- [h]	No	--
Zinc	37.4 (<BG)	24,000	480	67.8 [e]	No	--
Chloride	3.4 (<BG)	--	25,000	--	No	--
Nitrogen in nitrate	2.9 (<BG)	128,000	1,000	2,000	No	--
Nitrogen in nitrite and nitrate [i]	4.4	8,000	100	200	No	--
Sulfate	37.4 (<BG)	--	25,000	--	No	--

[a] Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] The statistical or maximum values for each COPC is determined in the 95% UCL calculation, which is located in Appendix E.

[c] No value because the distribution coefficient (K_d) value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[d] Technetium-99 was detected at an activity slightly above the soil lookup value for groundwater protection. Since the soil lookup value for protection of groundwater is conservatively modeled using an area of contamination of 10,000 m^2 (DOE-RL 2009b) and the excavation has a much smaller area of 750 m^2, it is believed that residual technetium-99 contamination within the excavation will not result in unacceptable contamination of groundwater above the MCL.

[e] Where cleanup levels are less than background, cleanup levels default to background levels (WAC 173-340-700[4][d]). 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 Area RDR/RAWP (DOE-RL 2009b).

[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[g] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[h] No parameters (bioconcentration factors or ambient water quality criteria values) are available from the Washington State Department of Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[i] No Hanford Site-specific or Washington State background value is available.

-- = not applicable
BG = background
COPC = contaminant of potential concern
MCL = maximum contaminant level
RAG = remedial action goal
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
UCL = upper confidence limit
WAC = *Washington Administrative Code*

Table 4. Comparison of the Maximum or Statistical Contaminant Concentrations to Action Levels for the 100-D-8 Overburden/Layback Verification Samples. (2 Pages)

COPC	Statistical Result [b] (pCi/g)	Soil Lookup Values (pCi/g) [a]			Does the Result Exceed Lookup Values?	Do the Results Pass RESRAD Modeling?
		Shallow Zone Lookup Value	Soil Lookup Value for Groundwater Protection	Soil Lookup Value for River Protection		
Cesium-137	0.0324 (<BG)	6.2	1,465	2,930	No	--
Nickel-63	7.44	4,013	83	166	No	--
Thorium-230	0.217	2.96	-- [c]	-- [c]	No	--
Uranium-234	0.208 (<BG)	1.1 [d]	1.1 [d]	1.1 [d]	No	--
Uranium-238	0.212 (<BG)	1.1 [d]	1.1 [d]	1.1 [d]	No	--
COPC	**Statistical or Maximum Result (mg/kg) [b]**	**Soil Cleanup Levels (mg/kg) [a]**			**Does the Result Exceed RAGs?**	**Does the Result Pass RESRAD Modeling?**
		Direct Exposure	**Protective of Groundwater**	**Protective of the River**		
Antimony	1.6	32	5 [d]	5 [d]	No	--
Arsenic	2.1 (<BG)	20 [d]	20 [d]	20 [d]	No	--
Barium	62.8 (<BG)	5,600	200	400	No	--
Boron [e]	2.3	7,200	320	-- [f]	No	--
Cadmium [g]	0.069 (<BG)	13.9 [h]	0.81 [d]	0.81 [d]	No	--
Chromium, total	5.9 (<BG)	80,000	18.5 [d]	18.5 [d]	No	--
Cobalt	11.2 (<BG)	24	15.7 [d]	-- [f]	No	--
Copper	15.7 (<BG)	2,960	59.2	22.0 [d]	No	--
Lead	4.2 (<BG)	353	10.2 [d]	10.2 [d]	No	--
Manganese	334 (<BG)	3,760	512 [d]	512 [d]	No	--
Mercury	0.0071 (<BG)	24	0.33 [d]	0.33 [d]	No	--
Molybdenum [e]	0.26	400 ~	8	-- [f]	No	--
Nickel	9.3 (<BG)	1,600	19.1 [d]	27.4	No	--
Vanadium	82.7 (<BG)	560	85.1 [d]	-- [f]	No	--
Zinc	44.5 (<BG)	24,000	480	67.8 [d]	No	--
Chloride	8.3 (<BG)	--	25,000	--	No	--
Nitrogen in nitrate	5.3 (<BG)	128,000	1,000	2,000	No	--
Nitrogen in nitrite [e] and nitrate	3.1	8,000	100	200	No	--
Sulfate	35.3 (<BG)	--	25,000	--	No	--
Bis(2-ethylhexyl)phthalate	0.092	71.4	0.6	0.36	No	--
Dimethyl phthalate	0.200	80,000	1,600	14,400	No	--

Table 4. Comparison of the Maximum or Statistical Contaminant Concentrations to Action Levels for the 100-D-8 Overburden/Layback Verification Samples. (2 Pages)

COPC	Statistical or Maximum Result (mg/kg) [b]	Soil Cleanup Levels (mg/kg) [a]			Does the Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Protective of Groundwater	Protective of the River		
4,4'-DDE	0.00032	2.94	0.0257	0.0033 [i]	No	--

[a] Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] The statistical or maximum values for each COPC is determined in the 95% UCL calculation, which is located in Appendix E.

[c] No value because the distribution coefficient (K_d) value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[d] Where cleanup levels are less than background, cleanup levels default to background levels (WAC 173-340-700[4][d]). 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 Area RDR/RAWP (DOE-RL 2009b).

[e] No Hanford Site-specific or Washington State background value is available.

[f] No parameters (bioconcentration factors or ambient water quality criteria values) are available from the Washington State Department of Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).

[g] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[h] 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]).

[i] Where cleanup levels are less than RDLs (DOE-RL 2009b), cleanup levels default to background per WAC 173-340-707(2) (Ecology 1996).

-- = not applicable
BG = background
COPC = contaminant of potential concern
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
UCL = upper confidence limit
WAC = *Washington Administrative Code*

Table 5. Comparison of the Maximum or Statistical Contaminant Concentrations to Action Levels for the 100-D-8 Waste Staging Pile Verification Samples. (2 Pages)

COPC	Statistical Result [b] (pCi/g)	Soil Lookup Values (pCi/g) [a]			Does the Result Exceed Lookup Values?	Do the Results Pass RESRAD Modeling?
		Shallow Zone Lookup Value	Soil Lookup Value for Groundwater Protection	Soil Lookup Value for River Protection		
Tritium	0.0593	459	12.6	25.2	No	--
Uranium-234	0.176 (<BG)	1.1 [c]	1.1 [c]	1.1 [c]	No	--
Uranium-238	0.163 (<BG)	1.1 [c]	1.1 [c]	1.1 [c]	No	--
COPC	**Statistical or Maximum Result (mg/kg) [b]**	**Soil Cleanup Levels (mg/kg) [a]**			**Does the Result Exceed RAGs?**	**Does the Result Pass RESRAD Modeling?**
		Direct Exposure	**Protective of Groundwater**	**Protective of the River**		
Antimony	0.41 (<BG)	32	5 [c]	5 [c]	No	--
Arsenic	3.1 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	85 (<BG)	5,600	200	400	No	--
Beryllium	0.51 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Boron [f]	1.3	7,200	320	-- [g]	No	--
Cadmium	0.078 (<BG)	13.9 [e]	0.81 [c]	0.81 [c]	No	--
Chromium, total	9.1 (<BG)	80,000	18.5 [c]	18.5 [c]	No	--
Hexavalent chromium [f]	0.213	2.1 [e]	4.8	2	No	--
Cobalt	8.2 (<BG)	24	15.7 [c]	-- [g]	No	--
Copper	16.1 (<BG)	2,960	59.2	22.0 [c]	No	--
Lead	4.9 (<BG)	353	10.2 [c]	10.2 [c]	No	--
Manganese	325 (<BG)	3,760	512 [c]	512 [c]	No	--
Mercury	0.064 (<BG)	24	0.33 [c]	0.33 [c]	No	--
Nickel	10.3 (<BG)	1,600	19.1 [c]	27.4	No	--
Vanadium	56.8 (<BG)	560	85.1 [c]	-- [g]	No	--
Zinc	53.1 (<BG)	24,000	480	67.8 [c]	No	--
Nitrogen in nitrate	1.5 (<BG)	128,000	1,000	2,000	No	--
Nitrogen in nitrite [f] and nitrate	2.9	8,000	100	200	No	--
Sulfate	4.5 (<BG)	--	25,000	--	No	--
Anthracene	0.0066	24,000	240	1,920	No	--
Benzo(a)anthracene	0.180	1.37	0.015 [h]	0.015 [h]	Yes	Yes [i]
Benzo(a)pyrene	0.100	0.137	0.015 [h]	0.015 [h]	Yes	Yes [i]
Benzo(b)fluoranthene	0.120	1.37	0.015 [h]	0.015 [h]	Yes	Yes [i]
Benzo(ghi)perylene [j]	0.044	2,400	48	192	No	--
Benzo(k)fluoranthene	0.067	1.37	0.015 [h]	0.015 [h]	Yes	Yes [i]
Chrysene	0.150	13.7	0.12	0.1 [h]	Yes	Yes [i]
Dibenz(a,h)anthracene	0.012	1.37	0.03	0.03	No	--
Fluoranthene	0.300	3,200	64	18.0	No	--
Indeno(1,2,3-cd)pyrene	0.062	1.37	0.33 [h]	0.33 [h]	No	--
Phenanthrene [j]	0.096	24,000	240	1,920	No	--
Pyrene	0.320	2,400	48	192	No	--
Bis(2-ethylhexyl)phthalate	0.090	71.4	0.6	0.36	No	--
Dimethylphthalate	0.160	80,000	1,600	14,400	No	--
Phenol	0.050	24,000	480	4,200	No	--
Dieldrin	0.00036	0.0625	0.0033 [h]	0.0033 [h]	No	--

Table 5. Comparison of the Maximum or Statistical Contaminant Concentrations to Action Levels for the 100-D-8 Waste Staging Pile Verification Samples. (2 Pages)

COPC	Statistical or Maximum Result (mg/kg) [b]	Soil Cleanup Levels (mg/kg) [a]			Does the Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Protective of Groundwater	Protective of the River		
4-4'-DDE	0.00026	2.94	0.0257	0.0033 [h]	No	--

[a] Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] 95% upper confidence limit or maximum value, depending on data censorship, as described in Appendix E.

[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700[4][d] (1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.1.2.1 of the 100 Area RDR/RAWP (DOE-RL 2009b).

[d] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[f] No Hanford Site-specific or Washington State background value is available.

[g] No parameters (bioconcentration factors or ambient water quality criteria values) are available from the Washington State Department of Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

[h] Where cleanup levels are less than RDLs, cleanup levels default to RDLs (DOE-RL 2009b) per WAC 173-340-707(2) (Ecology 1996).

[i] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene are not predicted to migrate because all of these contaminants have distribution coefficient (K_d) values greater than 80 mL/g. RESRAD modeling predicts that contaminants with K_d values greater than 80 mL/g will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River within 1,000 years. Therefore, residual concentrations of these constituents are predicted to be protective of groundwater and the Columbia River.

[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
Contaminant: benzo(g,h,i)perylene; surrogate: pyrene
Contaminant: phenathrene; surrogate: anthracene

-- = not applicable
BG = background
COPC = contaminant of potential concern
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = *Remedial Design Report/Remedial Action Work Plan for the 100 Area*
RESRAD = RESidual RADioactivity (dose assessment model)
WAC = *Washington Administrative Code*

Evaluation of the verification sampling results in Tables 3 through 5 shows that all direct exposure, groundwater protection, and Columbia River protection cleanup levels are met for all areas of the upland segment of the 100-D-8 waste site with the exception of the following:

- Several PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene) were detected above soil criteria for protection of groundwater and the Columbia River. However, RESidual RADioactivity (RESRAD) modeling as discussed in the 100 Area RDR/RAWP (DOE/RL-2009b) predicts that these constituents having high soil-partitioning coefficients (K_d) will not migrate within 1,000 years.

- Technetium-99 was detected at an activity slightly above the soil lookup value for groundwater protection. Since the soil lookup value for protection of groundwater is conservatively modeled using an area of contamination of 10,000 m^2 (DOE-RL 2009b) and the excavation has a much smaller area of 750 m^2, it is believed that residual technetium-99 contamination within the excavation will not result in unacceptable contamination of groundwater above the MCL.

All other COPCs for the upland segment of the 100-D-8 waste site were either not detected or were quantified below RAGs. Therefore, the remediation of the 100-D-8 waste site is protective of groundwater and the Columbia River.

Table 6 provides a comparison of the maximum sample results (Appendix C) for sediment samples collected from the shoreline segment against upland soil RAGs. This comparison is provided for information, but is not presented for making a cleanup decision concerning the shoreline, located below the OHWM. The sediment sample results collected within the remediated shoreline segment exceed upland soil RAGs. However, no further remediation of the below OHWM portion of the 100-D-8 waste site using the remove, treat, and dispose (RTD) remedy is recommended because interim action soil RAGs are not appropriately applied to sediments collected below the OWHM and the Remaining Sites ROD (EPA 1999)does not provide an in-water remedy for sediment. The sediment results exceeding upland soil RAGs are for metals concentrations that are comparable to concentrations measured at reference sites for the River Corridor Baseline Risk Assessment and for PAH and PCBs with low environmental mobility.

Table 6. Comparison of the Maximum Contaminant Concentrations to Action Levels for the 100-D-8 Waste Site Shoreline Segment Verification Samples. (2 Pages)

COPC	Maximum Result (pCi/g)	Soil Lookup Values (pCi/g) [a]			Does the Result Exceed Lookup Values?
		Shallow Zone Lookup Value	Soil Lookup Value for Groundwater Protection	Soil Lookup Value for River Protection	
Cesium-137	0.651	6.2	1,465	2,930	No
Cobalt-60	0.911	1.4	13,900	27,800	No
Europium-152	1.95	3.3	-- [b]	-- [b]	No
Nickel-63	36.1	4,013	83	166	No
Plutonium-239/240	0.203	35.1	-- [b]	-- [b]	No
Strontium-90	0.703	4.5	27.6	55.2	No
Uranium-234	0.798 (<BG)	1.1 [c]	1.1 [c]	1.1 [c]	No
Uranium-238	0.741 (<BG)	1.1 [c]	1.1 [c]	1.1 [c]	No
COPC	**Maximum Result (mg/kg)**	**Soil Cleanup Levels (mg/kg)[a]**			**Does the Result Exceed RAGs?**
		Direct Exposure	**Protective of Groundwater**	**Protective of the River**	
Antimony [d]	1.2 (<BG)	32	5 [c]	5 [c]	No
Arsenic	10.8	20 [c]	20 [c]	20 [c]	No
Barium	107 (<BG)	5,600	200	400	No
Beryllium	1.2 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No
Cadmium [d]	2.8	13.9 [e]	0.81 [c]	0.81 [c]	Yes
Chromium, total	36.6	80,000	18.5 [c]	18.5 [c]	Yes
Hexavalent chromium [f]	0.727	2.1 [e]	4.8	2	No
Cobalt	10.1 (<BG)	24	15.7 [c]	-- [g]	No
Copper	41.5	2,960	59.2	22.0 [c]	Yes
Lead	31.2	353	10.2 [c]	10.2 [c]	Yes
Manganese	518	3,760	512 [c]	512 [c]	Yes
Mercury	0.83	24	0.33 [c]	0.33 [c]	Yes
Molybdenum [f]	2.2	400	8	-- [g]	No

Table 6. Comparison of the Maximum Contaminant Concentrations to Action Levels for the 100-D-8 Waste Site Shoreline Segment Verification Samples. (2 Pages)

COPC	Maximum Result (mg/kg)	Soil Cleanup Levels (mg/kg) [a]			Does the Result Exceed RAGs?
		Direct Exposure	Protective of Groundwater	Protective of the River	
Nickel	13.1 (<BG)	1,600	19.1 [c]	27.4	No
Vanadium	85.3	560	85.1 [c]	-- [g]	Yes
Zinc	286	24,000	480	67.8 [c]	Yes
Acenaphthene	2.70	4,800	96	129	No
Benzo(a)anthracene	0.150	1.37	0.015 [h]	0.015 [h]	Yes
Benzo(a)pyrene	0.210	0.137	0.015 [h]	0.015 [h]	Yes
Benzo(b)fluoranthene	0.220	1.37	0.015 [h]	0.015 [h]	Yes
Benzo(ghi)perylene [i]	0.074	2,400	48	192	No
Benzo(k)fluoranthene	0.0099	1.37	0.015 [h]	0.015 [h]	No
Chrysene	0.150	13.7	0.12	0.1 [h]	Yes
Fluoranthene	0.240	3,200	64	18.0	No
Indeno(1,2,3-cd)pyrene	0.065	1.37	0.33 [h]	0.33 [h]	No
Phenanthrene [i]	0.036	24,000	240	1,920	No
Pyrene	0.027	2,400	48	192	No
Bis(2-ethylhexyl)phthalate	0.150	71.4	0.6	0.36	No
Dimethylphthalate	0.170	80,000	1,600	14,400	No
Phenol	0.048	24,000	480	4,200	No
Pyrene	0.230	2,400	48	192	No
Total PCBs	0.031	0.5 [j]	0.017 [h]	0.017 [h]	Yes
Aroclor-1254 [j]	0.014	0.5	0.017 [h]	0.017 [h]	No
Aroclor-1260 [j]	0.017	0.5	0.017 [h]	0.017 [h]	No
4-4'-DDE	0.00051	2.94	0.0257	0.0033 [h]	No
4-4'-DDT	0.0014	2.94	0.0257	0.0033 [h]	No

[a] Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2009b) unless otherwise noted. Radionuclide soil activities protective of groundwater and the river were calculated using RESRAD Version 6.4 assuming that no uncontaminated vadose zone exists between the contaminated zone and groundwater.

[b] No value because the distribution coefficient (K_d) value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700[4][d] (1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement Project managers as discussed in Section 2.1.2.1 of the 100 Area RDR/RAWP (DOE-RL 2009b).

[d] 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).

[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[f] No Hanford Site-specific or Washington State background value is available.

[g] No parameters (bioconcentration factors or ambient water quality criteria values) are available from the Washington State Department of Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

[h] Where cleanup levels are less than RDLs, cleanup levels default to RDLs (DOE-RL 2009b) per WAC 173-340-707(2) (Ecology 1996).

[i] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals:
Contaminant: benzo(g,h,i)perylene; surrogate: pyrene
Contaminant: phenathrene; surrogate: anthracene

[j] The soil cleanup value for PCBs is based on the formula presented in WAC 173-340-740(3)(a)(iii)(B) (Ecology 1996) and the cancer potency factor for ingestion of PCBs of 2.0 kg-day/mg (soils) from the EPA Integrated Risk Information System on the Internet at < http://www.epa.gov/iris >.

-- = 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 assessment model)
WAC = *Washington Administrative Code*

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-D-8 waste site is included in the statistical calculations (Appendix E). For the statistical data sets, no COPCs fail the "Model Toxics Control Act – Cleanup" three-part test (WAC 173-340, 1996). However, 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 for all decision units pass the three-part test with the exception of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene detected in one sample (J1N3W5). This sample was collected within the footprint of the waste staging pile area and fails one or more of the three-part test criteria for these PAHs. However, residual concentrations of PAHs in this sample location 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 upland portion of the 100-D-8 waste site 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-D-8 waste site using the highest of the statistical values from all areas. 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-D-8 waste sites is 2.3×10^{-3}, and the cumulative excess carcinogenic risk value is 1.2×10^{-6}, satisfying the criteria of 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 upland portion of the 100-D-8 waste site included calculation of the hazard quotient and carcinogenic (excess cancer) risk values for groundwater protection for nonradionuclides. 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 based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b). The cumulative hazard quotient is 5.2×10^{-2}, which is less than 1.0. No carcinogenic constituents were subject to the groundwater cancer risk calculations. Nonradionuclide risk requirements related to groundwater are met.

Attainment of Radionuclide Direct Exposure RAGs

Evaluation of the radionuclide cleanup verification results (Tables 3 through 5) indicates that all samples were below lookup values. Evaluation of direct exposure RAG attainment for radionuclides was performed using the single-radionuclide dose-equivalence lookup values to do sum of fractions evaluations. The model used to develop these dose-equivalence lookup values is presented in the 100 Area RDR/RAWP (DOE-RL 2009b).

Table 7 compares the radionuclide cleanup verification results above background from the excavation, staging pile area, and overburden/layback soil stockpile samples to direct exposure single radionuclide 15 mrem/yr dose-equivalence values and shows the sum-of-fractions evaluation for comparison of the total radionuclide dose to the RAG of 15 mrem/yr above background. The columns on the left side of the table are the COPCs and the radionuclide activities for the samples, with uranium values corrected for background, as appropriate. The fifth column presents the single radionuclide 15 mrem/yr dose-equivalence activities, and the last three columns present the radionuclide activities divided by the dose-equivalence activities. As demonstrated by the summation of the fractions for each decision unit, the maximum cumulative dose values contributed by the residual radionuclide populations are predicted to be less than the RAG of 15 mrem/yr above background.

Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in samples collected at the site but are not considered in the statistical calculations. These isotopes are excluded from consideration based on natural occurrence and were all detected below background levels (based on an assumption of secular equilibrium, the background activities for radium-228 and thorium-228 are equal to the statistical background activity of 1.32 pCi/g for thorium-232) (DOE-RL 2009a).

Table 7. Attainment of Radionuclide Direct Exposure Remedial Action Goals. (2 Pages)

COC/COPC	95% UCL Statistical Values (pCi/g)			Activity Equivalent to 15 mrem/yr Dose [a] (pCi/g)	Fraction		
	Excavation	SPA	Soil Stockpile		Excavation	SPA	Soil Stockpile
Cesium-137	--	--	0.0324 (<BG)	6.2	--	--	0.0052
Nickel-63	--	--	7.44	4,013	--	--	0.0019
Technetium-99	0.472	--	--	5.8	0.081	--	--
Thorium-230	0.195	--	0.217	2.96	0.0659	--	0.0733
Tritium	0.0149	0.0593	--	459	0.000032	0.00013	--

Table 7. Attainment of Radionuclide Direct Exposure Remedial Action Goals. (2 Pages)

COC/COPC	95% UCL Statistical Values (pCi/g)			Activity Equivalent to 15 mrem/yr Dose [a] (pCi/g)	Fraction		
	Excavation	SPA	Soil Stockpile		Excavation	SPA	Soil Stockpile
Uranium-233/234	0.375 (<BG)	0.176 (<BG)	0.208 (<BG)	1.1 [b]	0[c]	0[c]	0[c]
Uranium-238	0.356 (<BG)	0.163 (<BG)	0.212 (<BG)	1.1 [b]	0[c]	0[c]	0[c]
				Total	0.1469	0.00013	0.0804
				Equivalent Dose (mrem/yr)	2.20	0.002	1.21

[a] Single radionuclide 15 mrem/yr dose-equivalence values and derivation methodology are presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2009b).
[b] Value is background subtracted from statistical value resulting in no contribution to the sum of fractions for evaluation of dose.
[c] Radionuclide background subtracted from statistical value resulting in no contribution to the sum-of-fractions for evaluation of dose.

-- = not applicable
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
SPA = staging pile area
UCL = upper confidence limit

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the verification sampling approach, the field logbooks, and resulting analytical data with the sampling and data requirements specified by the project objectives and performance specifications. This review involves an 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) and completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2006). This DQA was performed in accordance with site-specific data quality objectives found in the SAP (DOE-RL 2009a).

The DQA for the 100-D-8 waste site established that the data are of the right type, quality, and quantity to support site verification decisions within specified error tolerances. The data set was found to be acceptable for decision-making purposes. The evaluation verified that the sample design was sufficient for the purpose of clean site verification. The cleanup verification sample analytical data are stored in the ENRE project-specific database for data evaluation prior to archival in HEIS and are summarized in Appendix E. The detailed DQA is presented in Appendix F.

SUMMARY FOR INTERIM CLOSURE

The upland segment of the 100-D-8 waste site has been remediated and evaluated in accordance with the Remaining Sites ROD (EPA 1999) and the 100 Area RDR/RAWP (DOE-RL 2009b). Statistical sampling to verify the completeness of remediation was performed, and analytical results were shown to meet the applicable cleanup objectives for direct exposure, groundwater

protection, and river protection. In accordance with this evaluation, the verification sampling results support a reclassification of the 100-D-8 waste site to Interim Closed Out.

The sediment sample results collected within the remediated shoreline segment exceed upland soil RAGs. However, no further remediation of the below OHWM portion of the 100-D-8 waste site using the RTD remedy is recommended because interim action soil RAGs are not appropriately applied to sediments collected below the OWHM and the Remaining Sites ROD (EPA 1999) does not provide an in-water remedy for sediment.

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APPENDIX A

ECOLOGICAL RISK COMPARISON TABLE

Table A-1. Maximum or Statistical Contaminant Concentrations that Exceed Ecological Screening Levels for the 100-D-8 Waste Site [a]. (2 Pages)

Hazardous Substance		2007 WAC 173-340 Table 749-3			EPA Ecological Soil Screening Levels [b]				Waste Site Analyses
		Plants	Soil Biota	Wildlife	Plants	Soil Biota	Avian [c]	Mammalian [c]	
Metals (mg/kg)									
	Background								
Antimony	5	5	--	--	--	78	--	0.27	1.6 (<BG)
Arsenic III	6.5*	--	--	7	18	--	43	46	3.1 (<BG)
Arsenic V	6.5*	10	60	132					
Barium	132	500	--	102	--	330	--	2,000	85.0 (<BG)
Beryllium	1.51	10	--	--	--	40	--	21	0.51 (<BG)
Boron	--	0.5	--	--	--	--	--	--	2.3
Cadmium	0.81	4	20	14	32	140	0.77	0.36	0.078 (<BG)
Chromium (total)	18.5	42 [d]	42 [d]	67	--	--	26	34	9.1(<BG)
Chromium VI	--	--	--	--	--	--	--	130	0.213
Cobalt	15.7	20	--	--	13	--	120	230	11.2 (<BG)
Copper	22	100	50	217	70	80	28	49	16.1 (<BG)
Lead	10.2	50	500	118	120	1,700	11	56	4.9 (<BG)
Manganese	512	1,100 [d]	--	1,500	220	450	4,300	4,000	334 (<BG)
Mercury, inorganic	0.33	0.3	0.1	5.5	--	--	--	--	0.064 (<BG)
Molybdenum	--	2	--	7	--	--	--	--	0.26
Nickel	19.1	30	200	980	38	280	210	130	11.8 (<BG)
Vanadium	85.1	2	--	--	--	--	7.8	280	82.7 (<BG)
Zinc	67.8	86 [d]	200	360	160	120	46	79	53.1 (<BG)
Pesticides (mg/kg)									
DDT/DDD/DDE (total)		--	0.75	--	--	--	0.093	0.021	0.00026
Dieldrin		--	0.07	--	--	--	0.022	0.0049	0.00036

Table A-1. Maximum or Statistical Contaminant Concentrations that Exceed Ecological Screening Levels for the 100-D-8 Waste Site [a]. (2 Pages)

Hazardous Substance	2007 WAC 173-340 Table 749-3			EPA Ecological Soil Screening Levels [b]				Waste Site Analyses
	Plants	Soil Biota	Wildlife	Plants	Soil Biota	Avian [c]	Mammalian [c]	
Other Chlorinated Organics (mg/kg)								
Low molecular weight PAHs [e]	--	--	--	--	29	--	100	0.4026
High molecular weight PAHs [f]	--	--	--	--	18	--	1.1	1.055
Benzo(a)pyrene	--	--	12	--	--	--	--	0.100

* The Hanford Site background for arsenic is 6.5 mg/kg. An arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement project managers as discussed in Section 2.1.2.1 of the *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, DOE-RL-96-17, Rev. 6.

[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 Columbia River corridor portion of the Hanford Site, which will include a more complete quantitative ecological risk assessment.

[b] Available at <www.epa/gov/ecotox/ecossl>.

[c] Wildlife.

[d] Benchmark replaced by Washington State natural background concentration.

[e] Low Molecular Weight Polynuclear Aromatic Hydrocarbons (LMW-PAHs), e.g., Acenaphthene, Acenaphthylene, Anthracene, Fluoranthene, Fluorene, Naphthalene, and Phenanthrene

[f] High Molecular Weight Polynuclear Aromatic Hydrocarbons (HMW-PAHs), e.g., Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenz[a,h]anthracene,

-- = not available
BG = background
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
EPA = U.S. Environmental Protection Agency
PAH = polycyclic aromatic hydrocarbons
RDR/RAWP = remedial design report/remedial action work plan
WAC = *Washington Administrative Code*

APPENDIX B

WASTE CHARACTERIZATION AND IN-PROCESS SAMPLE RESULTS

Table B-1. 100-D-8 Waste Characterization Sample Results - Inorganics. (2 Pages)

Sample Description	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pipe contents	J1CD80	10/26/10	9380		2.1	2.3	M	0.52	18.7		0.9	192		0.1	0.18	B	0.045
Soil - below outfall pipe	J1CD81	10/26/10	3870	L	1.4	0.41	B	0.35	1.4	N	0.61	72.5	L	0.07	0.062	B	0.031
Soil - southwest stockpile	J1CXL8	11/22/10	4050		1.4	0.34	U	0.34	1.6		0.59	59.7	X	0.067	0.029	U	0.029
Soil - west stockpile	J1CXL9	11/22/10	5820		1.6	0.4	U	0.4	2.3		0.69	67.4	X	0.08	0.036	B	0.035
Soil - northwest stockpile	J1CY74	12/15/10	5200	L	1.6	0.42	B	0.39	10.4		0.68	64	L	0.078	0.058	BM	0.034
Soil - south stockpile	J1CY75	12/15/10	4140	L	1.5	0.37	U	0.37	1.9		0.64	63.4	L	0.074	0.032	U	0.032

Sample Description	Sample Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil - below outfall pipe	J1CD80	10/26/10	6.7		1.3	7.5		0.056	17000	XN	19.2	516		0.079	14.7	L	0.14
Soil - southwest stockpile	J1CD81	10/26/10	0.91	U	0.91	1.1		0.038	4270	XL	13.1	4.6	L	0.054	6.6	L	0.093
Soil - west stockpile	J1CXL8	11/22/10	0.87	U	0.87	0.043	B	0.036	6280	XL	12.5	3.1	XL	0.051	8	L	0.089
Soil - northwest stockpile	J1CXL9	11/22/10	1	U	1	0.083	B	0.043	6860	XL	14.8	5.6	XL	0.061	8.3	L	0.1
Soil - south stockpile	J1CY74	12/15/10	1	U	1	0.053	B	0.042	16200	LN	14.5	4.5	XL	0.06	8.1	L	0.1
Soil	J1CY75	12/15/10	0.96	U	0.96	0.042	B	0.04	6430	L	13.8	3.6	XL	0.057	8.5	L	0.098

Sample Description	Sample Number	Sample Date	Hexavalent Chromium			Copper			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pipe contents	J1CD79	10/26/10	16.2		0.152												
Pipe contents	J1CD80	10/26/10	0.144	U	0.144	268		0.29	138000		5.2	968	L	0.37	4870	L	5
Soil - below outfall pipe	J1CD81	10/26/10				16.4	L	0.2	17900	L	3.5	7.7		0.25	3570	XL	3.4
Soil - southwest stockpile	J1CXL8	11/22/10				14		0.19	23200	L	3.4	2.9		0.24	3700	XL	3.3
Soil - west stockpile	J1CXL9	11/22/10				15.2		0.23	24500	L	4	4.6		0.28	4100	XL	3.9
Soil - northwest stockpile	J1CY74	12/15/10				16.7	L	0.22	21000	L	3.9	4.1		0.28	3840	L	3.8
Soil - south stockpile	J1CY75	12/15/10				12.8	L	0.21	22400	L	3.7	2.6		0.26	3940	L	3.6

Acronyms and notes apply to all of the tables in this appendix.

B = Detected below reporting limit
D = diluted
J = estimate
M = duplicate precision not met
MDA = mimimum detectable activity
P = RPD between columns exceeds 25%
PQL = practical quantitation limit
Q = qualifier
R = rejected
RPD = relative percent difference
U = undetected
X, L = physical and chemical interference present

Table B-1. 100-B-8 Waste Characterization Sample Results - Inorganics. (2 Pages)

Sample Description	Sample Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pipe contents	J1CD80	10/26/10	1010	L	0.14	9.5	M	0.2	15.1	M	0.35	87.5	LN	0.17	2020		55.7
Soil - below outfall pipe	J1CD81	10/26/10	230	L	0.093	0.024		0.005	0.28	B	0.24	7.4	L	0.11	574		38
Soil - southwest stockpile	J1CXL8	11/22/10	269	L	0.089	0.0055	U	0.006	0.23	U	0.23	7.2	L	0.11	580		36.4
Soil - west stockpile	J1CXL9	11/22/10	307	L	0.1	0.015	B	0.006	0.27	U	0.27	8.2	L	0.13	1040		43
Soil - northwest stockpile	J1CY74	12/15/10	264	L	0.1	0.0055	U	0.006	0.34	B	0.27	7.2	L	0.13	721		42.1
Soil - south stockpile	J1CY75	12/15/10	266	L	0.098	0.0055	U	0.006	0.25	U	0.25	7.5	L	0.12	525		40

Sample Description	Sample Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pipe contents	J1CD80	10/26/10	1.2	UN	1.2	293	N	1.9	1.1	M	0.22	981		80.2	53.9		0.13
Soil - below outfall pipe	J1CD81	10/26/10	0.8	UN	0.8	451		2.2	0.15	U	0.15	271		54.6	29.8	L	0.087
Soil - southwest stockpile	J1CXL8	11/22/10	0.76	U	0.76	116	L	1.9	0.14	U	0.14	325		52.4	51.9		0.083
Soil - west stockpile	J1CXL9	11/22/10	0.9	U	0.9	207	LN	2.2	0.17	U	0.17	292		61.8	51.1		0.099
Soil - northwest stockpile	J1CY74	12/15/10	0.88	U	0.88	65.7	N	2.2	0.16	U	0.16	501		60.6	49.2	L	0.097
Soil - south stockpile	J1CY75	12/15/10	0.84	U	0.84	142		2	0.16	U	0.16	311		57.5	51.7	L	0.092

Sample Description	Sample Number	Sample Date	Zinc		
			mg/kg	Q	PQL
Pipe contents	J1CD80	10/26/10	858	LM	0.54
Soil - below outfall pipe	J1CD81	10/26/10	92	L	0.37
Soil - southwest stockpile	J1CXL8	11/22/10	34.8	L	0.35
Soil - west stockpile	J1CXL9	11/22/10	40.6	L	0.42
Soil - northwest stockpile	J1CY74	12/15/10	47.6	L	0.41
Soil - south stockpile	J1CY75	12/15/10	37.8	L	0.39

Table B-2. 100-D-8 Waste Characterization Sample Results - TCLP. (1 Page)

Sample Description	Sample Number	Sample Date	TCLP Arsenic			TCLP Barium			TCLP Cadmium			TCLP Chromium		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Pipe contents	J1CD80	10/26/10	0.022	U	0.022	0.73	BX	0.002	0.022	B	0.002	0.05	BX	0.003
Soil - below outfall pipe	J1CD81	10/26/10	0.022	U	0.022	0.62	BX	0.002	0.011	B	0.002	0.003	U	0.003
Soil - southwest stockpile	J1CXL8	11/22/10	0.022	U	0.022	0.41	BX	0.002	0.002	U	0.002	0.005	B	0.003
Soil - west stockpile	J1CXL9	11/22/10	0.022	U	0.022	0.33	BX	0.002	0.002	U	0.002	0.003	BM	0.003

Sample Description	Sample Number	Sample Date	TCLP Lead			TCLP Mercury			TCLP Selenium			TCLP Silver		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Pipe contents	J1CD80	10/26/10	0.48	B	0.013	0.0026		0.00003	0.038	B	0.024	0.004	U	0.004
Soil - below outfall pipe	J1CD81	10/26/10	0.013	U	0.013	0.000035	B	0.00003	0.04	BXC	0.024	0.004	U	0.004
Soil - southwest stockpile	J1CXL8	11/22/10	0.016	B	0.013	0.000034	BXC	0.00003	0.024	U	0.024	0.004	U	0.004
Soil - west stockpile	J1CXL9	11/22/10	0.013	U	0.013	0.00003	U	0.00003	0.024	U	0.024	0.004	U	0.004

Sample Description	Sample Number	Sample Date	TCLP 1,4-Dichlorobenzene			TCLP 2,3,5- Trichlophenol			TCLP 2,4,6-Trichlorophenol			TCLP 2,4-Dinitrotoluene		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Pipe contents	J1CD80	10/26/10	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0084	U	0.0084
Soil - below outfall pipe	J1CD81	10/26/10	0.0016	U	0.0016	0.0022	U	0.0022	0.0014	U	0.0014	0.0084	U	0.0084

Sample Description	Sample Number	Sample Date	TCLP 2-Methylphenol (cresol,			TCLP 3+4 Methylphenol			TLCP Hexachloro-benzene			TCLP Hexachloro-butadiene		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Pipe contents	J1CD80	10/26/10	0.0049	U	0.0049	0.0013	U	0.0013	0.0033	U	0.0033	0.017	U	0.017
Soil - below outfall pipe	J1CD81	10/26/10	0.0049	U	0.0049	0.0013	U	0.0013	0.0033	U	0.0033	0.017	U	0.017

Sample Description	Sample Number	Sample Date	TCLP Hexachloro-ethane			TCLP Nitrobenzene			TCLP Pentachloro-phenol			TCLP Pyridine		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Pipe contents	J1CD80	10/26/10	0.011	U	0.011	0.0041	U	0.0041	0.0051	U	0.0051	0.0057	U	0.0057
Soil - below outfall pipe	J1CD81	10/26/10	0.011	U	0.011	0.0041	U	0.0041	0.0051	U	0.0051	0.0057	U	0.0057

Table B-3. 100-D-8 Waste Characterization Sample Results - Radionuclides. (1 Page)

Sample Description	HEIS Number	Sample Date	Americium-241 GEA			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Pipe contents	J1CD80	10/26/10	-0.424	U	1.32	36.1		0.15	10.7	U	0.436	61.9	U	1.22	15.6	U	0.902	0.358	U	0.492
Soil - below outfall pipe	J1CD81	10/26/10	-0.0151	U	0.121	0.0911		0.0265	0.003	U	0.028	0.0813	U	0.083	-0.0168	U	0.09	0.04	U	0.0938

Sample Description	HEIS Number	Sample Date	Carbon-14			Nickel-63			Plutonium-238			Plutonium-239/240			Total Beta Radiostrontium			Technicium-99		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Pipe contents	J1CD80	10/26/10	3.01		0.462	825		8.4	0.615		0.151	1.97		0.137	6.34		0.436	0.838		0.643
Soil - below outfall pipe	J1CD81	10/26/10	-0.109	U	0.462	-1.26	U	9.78	0	U	0.114	0	U	0.114	0.154	U	0.168	0.206	U	0.628

Sample Description	HEIS Number	Sample Date	Tritium			Uranium-234			Uranium-235			Uranium-238			Gross alpha			Gross beta		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Pipe contents	J1CD80	10/26/10	0.457		0.0946	0.447		0.121	0.028	U	0.115	0.42		0.101	11.5		3.28	169	U	4.72
Soil - below outfall pipe	J1CD81	10/26/10	0.186		0.034	0.0805	U	0.125	-0.002	U	0.108	0.0833	U	0.102	7.62		3.28	19.9	U	4.64

Table B-4. 100-D-8 Waste Characterization Sample Results - Organics. (2 Pages)

Constituent	J1CD80 10/26/2010			J1CD81 10/26/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs						
Acenaphthene	15	U	15	11	U	11
Acenaphthylene	13	U	13	9.6	U	9.6
Anthracene	4.5	U	4.5	3.3	U	3.3
Benzo(a)anthracene	4.8	U	4.8	3.4	U	3.4
Benzo(a)pyrene	9.5	U	9.5	6.8	U	6.8
Benzo(b)fluoranthene	6.3	U	6.3	4.5	U	4.5
Benzo(ghi)perylene	11	U	11	7.7	U	7.7
Benzo(k)fluoranthene	5.9	U	5.9	4.2	U	4.2
Chrysene	7.2	U	7.2	5.2	U	5.2
Dibenz[a,h]anthracene	16	U	16	12	U	12
Fluoranthene	19	U	19	14	U	14
Fluorene	7.9	U	7.9	5.6	U	5.6
Indeno(1,2,3-cd)pyrene	18	U	18	13	U	13
Naphthalene	18	U	18	13	U	13
Phenanthrene	18	U	18	13	U	13
Pyrene	18	UN	18	13	U	13
PCBs						
Aroclor-1016	41	UD	41	3	U	3
Aroclor-1221	120	UD	120	8.6	U	8.6
Aroclor-1232	29	UD	29	2.1	U	2.1
Aroclor-1242	68	UD	68	5	U	5
Aroclor-1248	68	UD	68	5	U	5
Aroclor-1254	940	PBD	38	2.8	U	2.8
Aroclor-1260	1000	D	38	2.8	U	2.8
SVOAs						
1,2,4-Trichlorobenzene	42	U	42	30	U	30
1,2-Dichlorobenzene	33	U	33	23	U	23
1,3-Dichlorobenzene	18	U	18	13	U	13
1,4-Dichlorobenzene	20	U	20	14	U	14
2,4,5-Trichlorophenol	15	U	15	11	U	11
2,4,6-Trichlorophenol	15	U	15	11	U	11
2,4-Dichlorophenol	15	U	15	11	U	11
2,4-Dimethylphenol	98	U	98	70	U	70
2,4-Dinitrophenol	500	U	500	350	U	350
2,4-Dinitrotoluene	98	U	98	70	U	70
2,6-Dinitrotoluene	42	U	42	30	U	30
2-Chloronaphthalene	15	U	15	11	U	11
2-Chlorophenol	31	U	31	22	U	22
2-Methylnaphthalene	28	U	28	20	U	20
2-Methylphenol (cresol, o-)	19	U	19	14	U	14
2-Nitroaniline	74	U	74	53	U	53
2-Nitrophenol	15	U	15	11	U	11
3+4 Methylphenol (cresol, m+p)	130	U	130	95	U	95
3,3'-Dichlorobenzidine	49	U	49	35	U	35
3-Nitroaniline	110	U	110	77	U	77
4,6-Dinitro-2-methylphenol	490	U	490	350	U	350
4-Bromophenylphenyl ether	28	U	28	20	U	20
4-Chloro-3-methylphenol	98	U	98	70	U	70
4-Chloroaniline	120	U	120	87	U	87
4-Chlorophenylphenyl ether	31	U	31	22	U	22

Table B-4. 100-D-8 Waste Characterization Sample Results - Organics. (2 Pages)

Constituent	J1CD80			J1CD81		
	10/26/2010			10/26/2010		
	µg/kg	Q	PQL	µg/kg	Q	PQL
4-Nitroaniline	110	U	110	77	U	77
4-Nitrophenol	140	U	140	100	U	100
Acenaphthene	15	U	15	11	U	11
Acenaphthylene	25	U	25	18	U	18
Anthracene	56	J	25	18	U	18
Benzo(a)anthracene	430	J	30	21	U	21
Benzo(a)pyrene	340	J	30	21	U	21
Benzo(b)fluoranthene	620	X	39	28	U	28
Benzo(ghi)perylene	210	J	24	17	U	17
Benzo(k)fluoranthene	60	UX	60	42	U	42
Bis(2-chloro-1-methylethyl)ether	34	U	34	24	U	24
Bis(2-Chloroethoxy)methane	34	U	34	24	U	24
Bis(2-chloroethyl) ether	25	U	25	18	U	18
Bis(2-ethylhexyl) phthalate	660	B	69	80	JB	49
Butylbenzylphthalate	64	U	64	46	U	46
Carbazole	54	U	54	38	U	38
Chrysene	420	J	40	29	U	29
Di-n-butylphthalate	57	J	28	20	U	20
Di-n-octylphthalate	30	U	30	21	U	21
Dibenz[a,h]anthracene	150	J	39	28	U	28
Dibenzofuran	34	U	34	24	U	24
Diethyl phthalate	68	J	43	31	U	31
Dimethyl phthalate	21	U	21	15	U	15
Fluoranthene	800		54	38	U	38
Fluorene	27	U	27	19	U	19
Hexachlorobenzene	43	U	43	31	U	31
Hexachlorobutadiene	15	U	15	11	U	11
Hexachlorocyclopentadiene	74	U	74	53	U	53
Hexachloroethane	32	U	32	23	U	23
Indeno(1,2,3-cd)pyrene	170	J	33	23	U	23
Isophorone	25	U	25	18	U	18
N-Nitroso-di-n-dipropylamine	46	U	46	33	U	33
N-Nitrosodiphenylamine	33	U	33	23	U	23
Naphthalene	46	U	46	33	U	33
Nitrobenzene	31	U	31	22	U	22
Pentachlorophenol	490	U	490	350	U	350
Phenanthrene	260	J	25	18	U	18
Phenol	42	J	27	19	U	19
Pyrene	670		18	13	U	13

Table B-5. 100-D-8 In-process Inorganic Sample Results - Inorganics. (5 Pages)

Sample Description	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil	J1F1C8	2/17/11	4750	X	1.5	0.92	M	0.36	1.9		0.62	60.7	X	0.071	0.031	U	0.031	0.92	U	0.92
Soil	J1F1C9	2/17/11	5110	X	1.3	0.66		0.33	1.6		0.57	54.8	X	0.066	0.029	U	0.029	0.85	U	0.85
Soil	J1F1D0	2/17/11	5250	X	1.4	0.33	U	0.33	1.9		0.58	44.5	X	0.067	0.029	U	0.029	0.86	U	0.86
Soil	J1F1D1	2/17/11	5000	X	1.5	0.38	B	0.36	0.62	U	0.62	70.1	X	0.071	0.031	U	0.031	0.92	U	0.92
Soil	J1F1D2	2/17/11	5310	X	1.4	0.6		0.34	3.1		0.6	101	X	0.069	0.03	U	0.03	0.89	U	0.89
Soil	J1F1D3	2/17/11	4430	X	1.4	0.36	B	0.34	1.3		0.59	60.3	X	0.068	0.029	U	0.029	0.87	U	0.87
Soil	J1F1D4	2/17/11	4910	X	1.4	0.45	B	0.35	3		0.62	62.6	X	0.071	0.031	U	0.031	0.92	U	0.92
Soil	J1F1D5	2/17/11	4950	X	1.4	0.35	U	0.35	1.9		0.6	50.3	X	0.069	0.03	U	0.03	0.89	U	0.89
Soil	J1F1D6	2/17/11	4970	X	1.4	0.42	B	0.34	1.3		0.59	61.6	X	0.067	0.029	U	0.029	0.87	U	0.87
Soil	J1F1D7	2/17/11	4700	X	1.4	0.5	B	0.33	1.6		0.58	76.2	X	0.066	0.029	U	0.029	0.85	U	0.85
Soil	J1F1D8	2/17/11	4490	X	1.5	0.37	U	0.37	1.2		0.63	57.9	X	0.073	0.032	U	0.032	0.94	U	0.94
Soil	J1F1D9	2/17/11	4100	X	1.4	0.5	B	0.34	1.1		0.59	56.9	X	0.068	0.029	U	0.029	0.87	U	0.87
Soil	J1H0K9	3/31/11	5860	X	1.4	0.35	U	0.35	3		0.62	72.2	X	0.071	0.031	U	0.031	0.92	U	0.92
Soil	J1H0L0	3/31/11	7000	X	1.5	0.37	U	0.37	3.5		0.65	82.4	X	0.075	0.032	U	0.032	0.96	U	0.96
Soil	J1H0L1	3/31/11	4670	X	1.5	0.37	U	0.37	2.5		0.65	53.7	X	0.075	0.032	U	0.032	0.96	U	0.96
Soil	J1H0L2	3/31/11	4750	X	1.5	0.37	U	0.37	2.1		0.64	49.7	X	0.074	0.032	U	0.032	0.96	U	0.96

Acronyms and notes apply to all of the tables in this appendix.

B = Detected below reporting limit
C = detected in sample and in blank
D = diluted
J = estimate
M = sample duplicate precision not met
MDA = mimimum detectable activity
PQL = practical quantitation limit
N = recovery exceeds upper or lower control limits
Q = qualifier
R = rejected
U = undetected
X = physical and chemical interference present

Table B-5. 100-D-8 In-process Inorganic Sample Results - Inorganics. (5 Pages)

Sample Description	Sample Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Hexavalent Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil	J1F1C8	2/17/11	0.14	BC	0.038	5210	X	13.2	5	X	0.054	8.1	X	0.094	13.1	X	0.2	0.155	U	0.155
Soil	J1F1C9	2/17/11	0.13	BC	0.035	5150	X	12.2	5.9	X	0.05	8	X	0.087	14.1	X	0.19	0.206		0.155
Soil	J1F1D0	2/17/11	0.046	BC	0.036	2350	X	12.4	9.4	X	0.051	4.7	X	0.088	11.8	X	0.19	0.155	U	0.155
Soil	J1F1D1	2/17/11	0.11	BC	0.038	5090	X	13.2	5.6	X	0.054	9.3	X	0.094	14.2	X	0.2	0.155	U	0.155
Soil	J1F1D2	2/17/11	0.79		0.037	7910	X	12.8	10.7	X	0.053	7.6	X	0.091	21.6	X	0.2	0.567		0.155
Soil	J1F1D3	2/17/11	0.053	BC	0.037	5270	X	12.6	4.5	X	0.052	8	X	0.089	12.7	X	0.19	0.155	U	0.155
Soil	J1F1D4	2/17/11	0.092	BC	0.038	5560	X	13.2	4.6	X	0.054	7.9	X	0.093	13.2	X	0.2	0.188		0.155
Soil	J1F1D5	2/17/11	0.29		0.037	2550	X	12.8	12.2	X	0.053	5.1	X	0.091	15.2	X	0.2	0.155	U	0.155
Soil	J1F1D6	2/17/11	0.091	BC	0.036	6100	X	12.5	5.1	X	0.052	9.3	X	0.089	13.2	X	0.19	0.155	U	0.155
Soil	J1F1D7	2/17/11	0.06	BC	0.036	6460	X	12.3	6	X	0.051	8.2	X	0.087	12.6	X	0.19	0.315		0.155
Soil	J1F1D8	2/17/11	0.086	BC	0.039	5630	X	13.6	5	X	0.056	7.7	X	0.096	13.2	X	0.21	0.155	U	0.155
Soil	J1F1D9	2/17/11	0.066	BC	0.036	5230	X	12.5	5.2	X	0.052	8.6	X	0.089	13	X	0.19	0.155	U	0.155
Soil	J1H0K9	3/31/11	0.62		0.038	4680	X	13.2	13.4	X	0.054	8.2	X	0.093	18.2		0.2	0.154	U	0.154
Soil	J1H0L0	3/31/11	0.51		0.04	4280	X	13.8	13.3	X	0.057	7.7	X	0.098	19.2		0.21	0.154	U	0.154
Soil	J1H0L1	3/31/11	0.14	B	0.04	3040	X	13.9	8.7	X	0.057	6	X	0.098	11.9		0.21	0.155	U	0.155
Soil	J1H0L2	3/31/11	0.18	B	0.04	3100	X	13.8	8.3	X	0.057	6.2	X	0.098	11.9		0.21	0.155	U	0.155

Table B-5. 100-D-8 In-process Inorganic Sample Results - Inorganics. (5 Pages)

Sample Description	Sample Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Molybdenum		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil	J1F1C8	2/17/11	24800	X	3.6	6.8		0.25	4060	X	3.5	428	X	0.094	0.0077	B	0.005	0.44	B	0.24
Soil	J1F1C9	2/17/11	23800	X	3.3	22.6		0.23	4060	X	3.2	288	X	0.087	0.0073	B	0.005	0.45	B	0.23
Soil	J1F1D0	2/17/11	12000	X	3.3	2.9		0.24	3140	X	3.2	202	X	0.088	0.0068	B	0.006	0.23	U	0.23
Soil	J1F1D1	2/17/11	26800	X	3.6	3.3		0.25	4480	X	3.5	330	X	0.094	0.013	B	0.006	0.24	U	0.24
Soil	J1F1D2	2/17/11	23500	X	3.4	17.9		0.25	4260	X	3.4	302	X	0.091	0.23		0.005	0.24	U	0.24
Soil	J1F1D3	2/17/11	24000	X	3.4	3.8		0.24	4120	X	3.3	287	X	0.089	0.005	U	0.005	0.23	U	0.23
Soil	J1F1D4	2/17/11	23600	X	3.5	10.4		0.25	4010	X	3.5	285	X	0.093	0.0056	U	0.006	0.24	U	0.24
Soil	J1F1D5	2/17/11	11700	X	3.5	11.3		0.25	3570	X	3.4	223	X	0.091	0.041		0.006	0.24	U	0.24
Soil	J1F1D6	2/17/11	26000	X	3.4	3		0.24	4770	X	3.3	327	X	0.089	0.0056	U	0.006	0.23	U	0.23
Soil	J1F1D7	2/17/11	24400	X	3.3	4.5		0.24	4180	X	3.2	306	X	0.087	0.005	U	0.005	0.23	U	0.23
Soil	J1F1D8	2/17/11	23200	X	3.7	4		0.26	4020	X	3.6	280	X	0.096	0.0051	U	0.005	0.25	U	0.25
Soil	J1F1D9	2/17/11	24700	X	3.4	3.6		0.24	4390	X	3.3	290	X	0.089	0.005	U	0.005	0.23	U	0.23
Soil	J1H0K9	3/31/11	20500	X	3.5	13.5	X	0.25	3980	X	3.5	291	X	0.093	0.18		0.006	0.28	B	0.24
Soil	J1H0L0	3/31/11	18500	X	3.7	11.4	X	0.26	3830	X	3.6	291	X	0.098	0.092		0.006	0.25	U	0.25
Soil	J1H0L1	3/31/11	14000	X	3.7	6.4	X	0.27	3090	X	3.6	226	X	0.098	0.022		0.005	0.26	U	0.26
Soil	J1H0L2	3/31/11	13600	X	3.7	6.5	X	0.26	3190	X	3.6	242	X	0.098	0.038	M	0.006	0.25	U	0.25

Table B-5. 100-D-8 In-process Inorganic Sample Results - Inorganics. (5 Pages)

Sample Description	Sample Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Soil	J1F1C8	2/17/11	7.5	X	0.12	602		38.4	0.8	U	0.8	189	X	2	0.15	U	0.15	301		55.2
Soil	J1F1C9	2/17/11	7.6	X	0.11	703		35.5	0.74	U	0.74	229	X	1.8	0.14	U	0.14	297		51.1
Soil	J1F1D0	2/17/11	12.6	X	0.11	660		36	0.76	U	0.76	143	X	1.8	0.14	U	0.14	184		51.8
Soil	J1F1D1	2/17/11	8.8	X	0.12	559		38.5	0.81	U	0.81	199	X	2	0.15	U	0.15	338		55.4
Soil	J1F1D2	2/17/11	9.7	X	0.11	691		37.2	0.78	U	0.78	230	X	1.9	0.15	U	0.15	362		53.6
Soil	J1F1D3	2/17/11	7.9	X	0.11	568		36.6	0.77	U	0.77	184	X	1.9	0.14	U	0.14	311		52.6
Soil	J1F1D4	2/17/11	8.4	X	0.11	685		38.3	0.8	U	0.8	232	X	2	0.15	U	0.15	325		55.1
Soil	J1F1D5	2/17/11	15.3	X	0.11	674		37.3	0.78	U	0.78	166	X	1.9	0.15	U	0.15	184		53.6
Soil	J1F1D6	2/17/11	9.6	X	0.11	687		36.4	0.76	U	0.76	228	X	1.9	0.14	U	0.14	350		52.4
Soil	J1F1D7	2/17/11	8.8	X	0.11	631		35.8	0.75	U	0.75	171	X	1.8	0.14	U	0.14	359		51.5
Soil	J1F1D8	2/17/11	8.4	X	0.12	602		39.4	0.83	U	0.83	189	X	2	0.15	U	0.15	336		56.8
Soil	J1F1D9	2/17/11	10	X	0.11	523		36.4	0.76	U	0.76	150	X	1.9	0.14	U	0.14	325		52.4
Soil	J1H0K9	3/31/11	12.2	XM	0.11	787		38.3	0.8	U	0.8	285	N	5.3	0.15	U	0.15	228		55.1
Soil	J1H0L0	3/31/11	13.1	X	0.12	823		40.2	0.84	U	0.84	215		5.5	0.16	U	0.16	224		57.8
Soil	J1H0L1	3/31/11	11	X	0.12	688		40.3	0.85	U	0.85	187		5.6	0.16	U	0.16	170		58
Soil	J1H0L2	3/31/11	11.3	X	0.12	707		40	0.84	U	0.84	207		5.5	0.16	U	0.16	190		57.5

Table B-5. 100-D-8 In-process Inorganic Sample Results - Inorganics. (5 Pages)

Sample Description	Sample Number	Sample Date	Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL
Soil	J1F1C8	2/17/11	69	X	0.088	47.2	X	0.37
Soil	J1F1C9	2/17/11	62.2	X	0.081	47.5	X	0.34
Soil	J1F1D0	2/17/11	27	X	0.083	24.5	X	0.35
Soil	J1F1D1	2/17/11	74.8	X	0.088	50.2	X	0.37
Soil	J1F1D2	2/17/11	58	X	0.085	75.3	X	0.36
Soil	J1F1D3	2/17/11	65.7	X	0.084	42.8	X	0.36
Soil	J1F1D4	2/17/11	64.3	X	0.088	42.8	X	0.37
Soil	J1F1D5	2/17/11	25.2	X	0.085	44.5	X	0.36
Soil	J1F1D6	2/17/11	71.2	X	0.083	45.5	X	0.35
Soil	J1F1D7	2/17/11	67.1	X	0.082	42.9	X	0.35
Soil	J1F1D8	2/17/11	64.3	X	0.09	42.1	X	0.38
Soil	J1F1D9	2/17/11	69.1	X	0.084	43.2	X	0.35
Soil	J1H0K9	3/31/11	52.4		0.088	84.5	X	0.37
Soil	J1H0L0	3/31/11	47.3		0.092	66.4	X	0.39
Soil	J1H0L1	3/31/11	35.5		0.092	33.1	X	0.39
Soil	J1H0L2	3/31/11	33.8		0.092	32.2	X	0.39

Table B-6. 100-D-8 In-process Sample Results - Radionuclides. (2 Pages)

Sample Description	HEIS Number	Sample Date	Americium-241 GEA			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil	J1F1C8	2/17/11	-0.0749	U	0.171	-0.005	U	0.0928	0.043	U	0.0989	0.102	U	0.193	0.0502	U	0.296	0.06	U	0.149
Soil	J1F1C9	2/17/11	-0.0163	U	0.13	0.0071	U	0.031	0.012	U	0.0294	0.0674	U	0.091	-0.0713	U	0.09	-0.021	U	0.0927
Soil	J1F1D0	2/17/11	-0.0382	U	0.0718	0.0018	U	0.0418	0.007	U	0.0415	-0.0014	U	0.106	0.0145	U	0.134	6E-04	U	0.0978
Soil	J1F1D1	2/17/11	0.0434	U	0.142	0.0141	U	0.0252	-0.002	U	0.0222	0.0032	U	0.053	0.0243	U	0.084	0.025	U	0.0615
Soil	J1F1D2	2/17/11	0.0056	U	0.0558	0.244		0.0404	0.055	U	0.0494	0.472		0.09	0.0048	U	0.118	0.033	U	0.0826
Soil	J1F1D3	2/17/11	0.0145	U	0.0467	-0.01	U	0.0278	5E-04	U	0.0292	-0.0173	U	0.073	0.0275	U	0.101	0.036	U	0.0638
Soil	J1F1D4	2/17/11	-0.0355	U	0.0649	-0.01	U	0.0395	-0.003	U	0.0368	-0.0565	U	0.096	0.0222	U	0.122	0.037	U	0.0949
Soil	J1F1D5	2/17/11	-0.0082	U	0.109	0.0266	U	0.0389	0.014	U	0.0434	0.0151	U	0.093	-0.0246	U	0.121	0.03	U	0.0885
Soil	J1F1D6	2/17/11	-0.0457	U	0.121	0.0108	U	0.0299	-4E-04	U	0.029	-0.0555	U	0.08	-0.0238	U	0.085	-0.037	U	0.0881
Soil	J1F1D7	2/17/11	0.0437	U	0.145	0.0094	U	0.025	-0.011	U	0.0229	0.0376	U	0.058	-0.0008	U	0.083	0.013	U	0.0629
Soil	J1F1D8	2/17/11	0.011	U	0.0625	-0.01	U	0.0371	-5E-04	U	0.0373	0.0323	U	0.103	0.0227	U	0.125	-0.053	U	0.0868
Soil	J1F1D9	2/17/11	-0.0144	U	0.12	-0.015	U	0.0249	0.004	U	0.0274	-0.193	U	0.07	-0.0113	U	0.079	-0.022	U	0.0829
Soil	J1H0K9	3/31/11	0.034	U	0.113	0.409		0.0366	0.036	U	0.0467	0.634		0.096	0.0596	U	0.128	0.031	U	0.0959
Soil	J1H0L0	3/31/11	0.0387	U	0.275	0.151		0.0326	0.019	U	0.0349	0.0904	U	0.089	0.0127	U	0.106	0.033	U	0.0967
Soil	J1H0L1	3/31/11	-0.003	U	0.111	-0.008	U	0.036	-9E-04	U	0.0328	0.0256	U	0.095	-0.0226	U	0.121	0.035	U	0.0857
Soil	J1H0L2	3/31/11	-0.0104	U	0.128	-0.004	U	0.0283	-0.008	U	0.0283	0.0688	U	0.085	-0.0128	U	0.098	-0.014	U	0.0914

Sample Description	HEIS Number	Sample Date	Carbon-14			Nickel-63			Plutonium-238			Plutonium-239/240			Total Beta Radiostrontium			Technicium-99		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil	J1F1C8	2/17/11	0.186	U	0.457	1.38	U	8.77	-0.002	U	0.123	-0.0016	U	0.123	0.174		0.114	0.499	U	0.619
Soil	J1F1C9	2/17/11	-0.0437	U	0.458	-0.717	U	8.64	0	U	0.113	0.0286	U	0.113	0.0427	U	0.107	0.375	U	0.611
Soil	J1F1D0	2/17/11	-0.0484	U	0.46	2.36	U	8.77	-0.003	U	0.135	0	U	0.121	0.079	U	0.102	0.38	U	0.609
Soil	J1F1D1	2/17/11	-0.0092	U	0.458	4.45	U	8.43	-0.01	U	0.171	0.0325	U	0.122	-0.0092	U	0.106	0.442	U	0.613
Soil	J1F1D2	2/17/11	0.245	U	0.459	13.5		8.77	0.025	U	0.132	0	U	0.109	0.132		0.095	0.695		0.608
Soil	J1F1D3	2/17/11	0.0939	U	0.459	0.407	U	8.77	0	U	0.136	-0.0018	U	0.136	0.0039	U	0.104	0.332	U	0.609
Soil	J1F1D4	2/17/11	-0.019	U	0.459	0.248	U	8.51	0	U	0.125	0	U	0.125	0.0017	U	0.099	0.339	U	0.617
Soil	J1F1D5	2/17/11	0.0456	U	0.458	2.28	U	8.44	0	U	0.139	0	U	0.139	0.0286	U	0.102	0.296	U	0.61
Soil	J1F1D6	2/17/11	0.276	U	0.459	0.717	U	8.51	0	U	0.12	0	U	0.12	0.0615	U	0.111	0.443	U	0.614
Soil	J1F1D7	2/17/11	0.113	U	0.459	-0.12	U	8.77	0	U	0.127	0	U	0.127	0.037	U	0.093	0.455	U	0.618
Soil	J1F1D8	2/17/11	0.0088	U	0.461	-1.4	U	8.77	-0.002	U	0.133	0	U	0.133	-0.0012	U	0.093	0.507	U	0.611
Soil	J1F1D9	2/17/11	0.133	U	0.459	2.3	U	8.77	0	U	0.147	0	U	0.146	0.103		0.1	0.569	U	0.615
Soil	J1H0K9	3/31/11	0.0003	U	0.0118	5.37	U	13.1	0	U	0.111	0	U	0.111	0.148	U	0.148	-0.087	U	0.65
Soil	J1H0L0	3/31/11	-0.0048	U	0.0118	-0.55	U	12.9	0	U	0.163	-0.0022	U	0.163	0.0888	U	0.134	-0.005	U	0.646
Soil	J1H0L1	3/31/11	-3E-05	U	0.0118	-0.629	U	13.7	-0.003	U	0.187	-0.0025	U	0.187	0.0689	U	0.129	-0.033	U	0.648
Soil	J1H0L2	3/31/11	-0.0033	U	0.0118	-9.25	U	13.2	0	U	0.141	0.0377	U	0.141	0.0845	U	0.134	-0.25	U	0.654

Table B-6. 100-D-8 In-process Sample Results - Radionuclides. (2 Pages)

Sample Description	HEIS Number	Sample Date	Tritium			Uranium-234			Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Soil	J1F1C8	2/17/11	0.0072	U	0.0165	0.152	U	0.164	-0.006	U	0.123	0.0499	U	0.177
Soil	J1F1C9	2/17/11	0.0082	U	0.0222	0.19		0.157	0.019	U	0.129	0.191		0.153
Soil	J1F1D0	2/17/11	0.0121	U	0.0275	0.422		0.158	-0.006	U	0.129	0.465		0.18
Soil	J1F1D1	2/17/11	0.0086	U	0.0218	0.303		0.163	-0.006	U	0.124	0.232		0.156
Soil	J1F1D2	2/17/11	0.0082	U	0.0191	0.274		0.12	-0.001	U	0.101	0.218		0.123
Soil	J1F1D3	2/17/11	0.0077	U	0.0169	0.147	U	0.166	-0.007	U	0.136	0.31		0.166
Soil	J1F1D4	2/17/11	0.0029	U	0.0134	0.2		0.134	-0.002	U	0.113	0.0825	U	0.137
Soil	J1F1D5	2/17/11	0.0115	U	0.018	0.24		0.175	-0.004	U	0.117	0.187		0.178
Soil	J1F1D6	2/17/11	0.0115	U	0.0187	0.0899	U	0.16	0.046	U	0.131	0.246		0.16
Soil	J1F1D7	2/17/11	0.0107	U	0.0181	0.219		0.128	-0.001	U	0.102	0.191		0.131
Soil	J1F1D8	2/17/11	0.001	U	0.0234	0.111	U	0.176	0.022	U	0.118	0.115	U	0.165
Soil	J1F1D9	2/17/11	0.0048	U	0.0158	0.229		0.145	-0.006	U	0.122	0.204		0.149
Soil	J1H0K9	3/31/11	0.0056	U	0.0179	0.427		0.159	-0.011	U	0.143	0.493		0.178
Soil	J1H0L0	3/31/11	0.0099	U	0.0271	0.29		0.209	-0.007	U	0.145	0.443		0.186
Soil	J1H0L1	3/31/11	0.0011	U	0.0136	0.272		0.105	0.024	U	0.0938	0.221		0.113
Soil	J1H0L2	3/31/11	0.0044	U	0.0243	0.194		0.104	-0.001	U	0.104	0.0804	U	0.116

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1C8			J1F1C9			J1F1D0			J1F1D1		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	9.6	U	9.6	9.9	U	9.9	9.7	U	9.7	9.6	U	9.6
Acenaphthylene	8.6	U	8.6	8.9	U	8.9	8.7	U	8.7	8.6	U	8.6
Anthracene	2.9	U	2.9	3	U	3	2.9	U	2.9	2.9	U	2.9
Benzo(a)anthracene	3.1	U	3.1	3.1	U	3.1	3.1	U	3.1	3.1	U	3.1
Benzo(a)pyrene	6.1	U	6.1	6.3	U	6.3	6.2	U	6.2	6.1	U	6.1
Benzo(b)fluoranthene	4	U	4	4.1	U	4.1	4.1	U	4.1	4	U	4
Benzo(ghi)perylene	6.9	U	6.9	7.1	U	7.1	7	U	7	6.9	U	6.9
Benzo(k)fluoranthene	3.8	U	3.8	3.9	U	3.9	3.8	U	3.8	3.8	U	3.8
Chrysene	4.6	U	4.6	4.8	U	4.8	4.7	U	4.7	4.6	U	4.6
Dibenz[a,h]anthracene	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	12	U	12	13	U	13	13	U	13	12	U	12
Fluorene	5.1	U	5.1	5.2	U	5.2	5.1	U	5.1	5.1	U	5.1
Indeno(1,2,3-cd)pyrene	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	12	U	12	12	U	12	12	U	12	12	U	12
PCBs												
Aroclor-1016	2.8	U	2.8	2.9	U	2.9	2.8	U	2.8	2.9	U	2.9
Aroclor-1221	8.2	U	8.2	8.3	U	8.3	8.2	U	8.2	8.3	U	8.3
Aroclor-1232	2	U	2	2.1	U	2.1	2	U	2	2.1	U	2.1
Aroclor-1242	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8
Aroclor-1248	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8
Aroclor-1254	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Aroclor-1260	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Pesticides												
Aldrin	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24	0.25	U	0.25
Alpha-BHC	0.21	U	0.21	0.2	U	0.2	0.21	U	0.21	0.21	U	0.21
alpha-Chlordane	0.31	U	0.31	0.31	U	0.31	0.31	U	0.31	0.32	U	0.32
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.65	U	0.65	0.64	U	0.64	0.64	U	0.64	0.66	U	0.66
Delta-BHC	0.39	U	0.39	0.38	U	0.38	0.39	U	0.39	0.4	U	0.4
Dichlorodiphenyldichloroethane	0.53	U	0.53	0.52	U	0.52	0.53	U	0.53	0.54	U	0.54
Dichlorodiphenyldichloroethylene	0.23	U	0.23	0.23	U	0.23	0.23	U	0.23	0.24	U	0.24
Dichlorodiphenyltrichloroethane	0.57	U	0.57	0.56	U	0.56	0.57	U	0.57	0.67	J	0.58
Dieldrin	0.2	U	0.2	0.2	U	0.2	0.2	U	0.2	0.21	U	0.21
Endosulfan I	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17
Endosulfan II	0.28	U	0.28	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28
Endosulfan sulfate	0.27	U	0.27	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27
Endrin	0.3	U	0.3	0.29	U	0.29	0.3	U	0.3	0.3	U	0.3
Endrin aldehyde	0.17	U	0.17	0.16	U	0.16	0.17	U	0.17	0.17	U	0.17
Endrin ketone	0.48	U	0.48	0.47	U	0.47	0.47	U	0.47	0.48	U	0.48
Gamma-BHC (Lindane)	0.45	U	0.45	0.44	U	0.44	0.45	U	0.45	0.46	U	0.46
gamma-Chlordane	0.26	U	0.26	0.25	U	0.25	0.26	U	0.26	0.26	U	0.26
Heptachlor	0.21	U	0.21	0.2	U	0.2	0.21	U	0.21	0.21	U	0.21
Heptachlor epoxide	0.42	U	0.42	0.41	U	0.41	0.41	U	0.41	0.42	U	0.42
Methoxychlor	0.44	U	0.44	0.43	U	0.43	0.43	U	0.43	0.45	U	0.45
Toxaphene	15	U	15	15	U	15	15	U	15	16	U	16

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1C8			J1F1C9			J1F1D0			J1F1D1		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	27	U	27	27	U	27	27	U	27	28	U	28
1,2-Dichlorobenzene	21	U	21	21	U	21	21	U	21	22	U	22
1,3-Dichlorobenzene	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	13	U	13	13	U	13	13	U	13	14	U	14
2,4,5-Trichlorophenol	9.6	U	9.6	9.6	U	9.6	9.7	U	9.7	10	U	10
2,4,6-Trichlorophenol	9.6	U	9.6	9.6	U	9.6	9.7	U	9.7	10	U	10
2,4-Dichlorophenol	9.6	U	9.6	9.6	U	9.6	9.7	U	9.7	10	U	10
2,4-Dimethylphenol	63	U	63	63	U	63	64	U	64	67	U	67
2,4-Dinitrophenol	320	U	320	320	U	320	320	U	320	340	U	340
2,4-Dinitrotoluene	63	U	63	63	U	63	64	U	64	67	U	67
2,6-Dinitrotoluene	27	U	27	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	9.6	U	9.6	9.6	U	9.6	9.7	U	9.7	10	U	10
2-Chlorophenol	20	U	20	20	U	20	20	U	20	21	U	21
2-Methylnaphthalene	18	U	18	18	U	18	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	12	U	12	12	U	12	13	U	13	13	U	13
2-Nitroaniline	48	U	48	48	U	48	48	U	48	50	U	50
2-Nitrophenol	9.6	U	9.6	9.6	U	9.6	9.7	U	9.7	10	U	10
3+4 Methylphenol (cresol, m+p)	86	U	86	86	U	86	87	U	87	91	U	91
3,3'-Dichlorobenzidine	32	U	32	32	U	32	32	U	32	33	U	33
3-Nitroaniline	70	U	70	70	U	70	71	U	71	74	U	74
4,6-Dinitro-2-methylphenol	320	U	320	320	U	320	320	U	320	330	U	330
4-Bromophenylphenyl ether	18	U	18	18	U	18	18	U	18	19	U	19
4-Chloro-3-methylphenol	63	U	63	63	U	63	64	U	64	67	U	67
4-Chloroaniline	79	U	79	79	U	79	79	U	79	83	U	83
4-Chlorophenylphenyl ether	20	U	20	20	U	20	20	U	20	21	U	21
4-Nitroaniline	70	U	70	70	U	70	70	U	70	73	U	73
4-Nitrophenol	93	U	93	93	U	93	94	U	94	98	U	98
Acenaphthene	9.9	U	9.9	9.9	U	9.9	10	U	10	10	U	10
Acenaphthylene	16	U	16	16	U	16	16	U	16	17	U	17
Anthracene	16	U	16	16	U	16	16	U	16	17	U	17
Benzo(a)anthracene	19	U	19	19	U	19	19	U	19	20	U	20
Benzo(a)pyrene	19	U	19	19	U	19	19	U	19	20	U	20
Benzo(b)fluoranthene	25	U	25	25	U	25	25	U	25	26	U	26
Benzo(ghi)perylene	15	U	15	15	U	15	15	U	15	16	U	16
Benzo(k)fluoranthene	38	U	38	38	U	38	39	U	39	40	U	40
Bis(2-chloro-1-methylethyl)ether	22	U	22	22	U	22	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	22	U	22	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ether	16	U	16	16	U	16	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	44	U	44	44	U	44	44	U	44	46	U	46
Butylbenzylphthalate	41	U	41	41	U	41	42	U	42	43	U	43
Carbazole	35	U	35	35	U	35	35	U	35	36	U	36
Chrysene	26	U	26	26	U	26	26	U	26	27	U	27
Di-n-butylphthalate	18	U	18	18	U	18	18	U	18	19	U	19
Di-n-octylphthalate	19	U	19	19	U	19	19	U	19	20	U	20
Dibenz[a,h]anthracene	25	U	25	25	U	25	25	U	25	26	U	26
Dibenzofuran	22	U	22	22	U	22	22	U	22	23	U	23
Diethyl phthalate	28	U	28	28	U	28	28	U	28	29	U	29
Dimethyl phthalate	14	U	14	14	U	14	14	U	14	15	U	15
Fluoranthene	35	U	35	35	U	35	35	U	35	36	U	36

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1C8			J1F1C9			J1F1D0			J1F1D1		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	17	U	17	17	U	17	17	U	17	18	U	18
Hexachlorobenzene	28	U	28	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	9.6	U	9.6	9.6	U	9.6	9.7	U	9.7	10	U	10
Hexachlorocyclopentadiene	48	U	48	48	U	48	48	U	48	50	U	50
Hexachloroethane	20	U	20	20	U	20	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	21	U	21	21	U	21	21	U	21	22	U	22
Isophorone	16	U	16	16	U	16	16	U	16	17	U	17
N-Nitroso-di-n-dipropylamine	30	U	30	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	21	U	21	21	U	21	21	U	21	22	U	22
Naphthalene	30	U	30	30	U	30	30	U	30	31	U	31
Nitrobenzene	20	U	20	20	U	20	20	U	20	21	U	21
Pentachlorophenol	320	U	320	320	U	320	320	U	320	330	U	330
Phenanthrene	16	U	16	16	U	16	16	U	16	17	U	17
Phenol	17	U	17	17	U	17	17	U	17	18	U	18
Pyrene	12	U	12	12	U	12	12	U	12	12	U	12

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1D2			J1F1D3			J1F1D4			J1F1D5		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	20	JX	9.9	10	U	10	10	U	10	9.3	U	9.3
Acenaphthylene	8.9	U	8.9	9	U	9	9.2	U	9.2	8.4	U	8.4
Anthracene	35		3	3	U	3	3.1	U	3.1	2.8	U	2.8
Benzo(a)anthracene	60		3.2	3.2	U	3.2	3.3	U	3.3	7.1	J	3
Benzo(a)pyrene	29		6.3	6.4	U	6.4	6.6	U	6.6	6	U	6
Benzo(b)fluoranthene	45		4.2	4.2	U	4.2	4.3	U	4.3	7.5	J	3.9
Benzo(ghi)perylene	7.1	U	7.1	7.2	U	7.2	7.4	U	7.4	6.7	U	6.7
Benzo(k)fluoranthene	15	X	3.9	3.9	U	3.9	4	U	4	3.7	U	3.7
Chrysene	56		4.8	4.8	U	4.8	5	U	5	4.5	U	4.5
Dibenz[a,h]anthracene	11	U	11	11	U	11	11	U	11	10	U	10
Fluoranthene	120		13	13	U	13	13	U	13	12	U	12
Fluorene	12	J	5.2	5.3	U	5.3	5.4	U	5.4	4.9	U	4.9
Indeno(1,2,3-cd)pyrene	12	U	12	12	U	12	12	U	12	11	U	11
Naphthalene	12	U	12	12	U	12	12	U	12	11	U	11
Phenanthrene	71		12	12	U	12	12	U	12	11	U	11
Pyrene	110		12	12	U	12	12	U	12	11	U	11
PCBs												
Aroclor-1016	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	8.1	U	8.1	8.1	U	8.1	8.1	U	8.1	8.1	U	8.1
Aroclor-1232	2	U	2	2	U	2	2	U	2	2	U	2
Aroclor-1242	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7
Aroclor-1248	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7
Aroclor-1254	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6
Aroclor-1260	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6
Pesticides												
Aldrin	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.23	U	0.23
Alpha-BHC	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.2	U	0.2
alpha-Chlordane	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32	0.3	U	0.3
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.66	U	0.66	0.65	U	0.65	0.67	U	0.67	0.62	U	0.62
Delta-BHC	0.4	U	0.4	0.39	U	0.39	0.4	U	0.4	0.37	U	0.37
Dichlorodiphenyldichloroethane	0.54	U	0.54	0.53	U	0.53	0.55	U	0.55	0.51	U	0.51
Dichlorodiphenyldichloroethylene	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24	0.22	U	0.22
Dichlorodiphenyltrichloroethane	2.8		0.59	0.58	U	0.58	0.59	U	0.59	0.55	U	0.55
Dieldrin	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.2	U	0.2
Endosulfan I	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18	0.16	U	0.16
Endosulfan II	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29	0.27	U	0.27
Endosulfan sulfate	0.27	U	0.27	0.27	U	0.27	0.28	U	0.28	0.26	U	0.26
Endrin	0.3	U	0.3	0.3	U	0.3	0.31	U	0.31	0.28	U	0.28
Endrin aldehyde	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.16	U	0.16
Endrin ketone	0.49	U	0.49	0.48	U	0.48	0.49	U	0.49	0.46	U	0.46
Gamma-BHC (Lindane)	0.46	U	0.46	0.45	U	0.45	0.47	U	0.47	0.43	U	0.43
gamma-Chlordane	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.25	U	0.25
Heptachlor	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.2	U	0.2
Heptachlor epoxide	0.42	U	0.42	0.42	U	0.42	0.43	U	0.43	0.4	U	0.4
Methoxychlor	0.45	U	0.45	0.44	U	0.44	0.45	U	0.45	0.42	U	0.42
Toxaphene	16	U	16	15	U	15	16	U	16	15	U	15

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1D2 2/17/2011			J1F1D3 2/17/2011			J1F1D4 2/17/2011			J1F1D5 2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	27	U	27	26	U	26	27	U	27	27	U	27
1,2-Dichlorobenzene	21	U	21	21	U	21	21	U	21	21	U	21
1,3-Dichlorobenzene	11	U	11	11	U	11	12	U	12	11	U	11
1,4-Dichlorobenzene	13	U	13	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	9.5	U	9.5	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5
2,4,6-Trichlorophenol	9.5	U	9.5	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5
2,4-Dichlorophenol	9.5	U	9.5	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5
2,4-Dimethylphenol	63	U	63	62	U	62	64	U	64	63	U	63
2,4-Dinitrophenol	320	U	320	310	U	310	320	U	320	320	U	320
2,4-Dinitrotoluene	63	U	63	62	U	62	64	U	64	63	U	63
2,6-Dinitrotoluene	27	U	27	26	U	26	27	U	27	27	U	27
2-Chloronaphthalene	9.5	U	9.5	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5
2-Chlorophenol	20	U	20	20	U	20	20	U	20	20	U	20
2-Methylnaphthalene	18	U	18	18	U	18	18	U	18	18	U	18
2-Methylphenol (cresol, o-)	12	U	12	12	U	12	13	U	13	12	U	12
2-Nitroaniline	48	U	48	47	U	47	48	U	48	47	U	47
2-Nitrophenol	9.5	U	9.5	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5
3+4 Methylphenol (cresol, m+p)	86	U	86	85	U	85	87	U	87	85	U	85
3,3'-Dichlorobenzidine	31	U	31	31	U	31	32	U	32	31	U	31
3-Nitroaniline	70	U	70	69	U	69	71	U	71	69	U	69
4,6-Dinitro-2-methylphenol	310	U	310	310	U	310	320	U	320	310	U	310
4-Bromophenylphenyl ether	18	U	18	18	U	18	18	U	18	18	U	18
4-Chloro-3-methylphenol	63	U	63	62	U	62	64	U	64	63	U	63
4-Chloroaniline	78	U	78	77	U	77	79	U	79	78	U	78
4-Chlorophenylphenyl ether	20	U	20	20	U	20	20	U	20	20	U	20
4-Nitroaniline	69	U	69	68	U	68	70	U	70	69	U	69
4-Nitrophenol	92	U	92	92	U	92	94	U	94	92	U	92
Acenaphthene	9.8	U	9.8	9.7	U	9.7	10	U	10	9.8	U	9.8
Acenaphthylene	16	U	16	16	U	16	16	U	16	16	U	16
Anthracene	16	U	16	16	U	16	16	U	16	16	U	16
Benzo(a)anthracene	61	J	19	19	U	19	19	U	19	19	U	19
Benzo(a)pyrene	60	J	19	19	U	19	19	U	19	19	U	19
Benzo(b)fluoranthene	93	J	25	25	U	25	25	U	25	25	U	25
Benzo(ghi)perylene	36	J	15	15	U	15	16	U	16	15	U	15
Benzo(k)fluoranthene	38	U	38	38	U	38	39	U	39	38	U	38
Bis(2-chloro-1-methylethyl)ether	22	U	22	22	U	22	22	U	22	22	U	22
Bis(2-Chloroethoxy)methane	22	U	22	22	U	22	22	U	22	22	U	22
Bis(2-chloroethyl) ether	16	U	16	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	44	U	44	43	U	43	45	U	45	44	U	44
Butylbenzylphthalate	41	U	41	41	U	41	42	U	42	41	U	41
Carbazole	34	U	34	34	U	34	35	U	35	34	U	34
Chrysene	70	J	26	25	U	25	26	U	26	26	U	26
Di-n-butylphthalate	18	U	18	18	U	18	18	U	18	18	U	18
Di-n-octylphthalate	19	U	19	19	U	19	19	U	19	19	U	19
Dibenz[a,h]anthracene	25	U	25	25	U	25	25	U	25	25	U	25
Dibenzofuran	22	U	22	22	U	22	22	U	22	22	U	22
Diethyl phthalate	28	U	28	27	U	27	28	U	28	28	U	28
Dimethyl phthalate	14	U	14	14	U	14	14	U	14	14	U	14
Fluoranthene	54	J	34	34	U	34	35	U	35	34	U	34

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1D2			J1F1D3			J1F1D4			J1F1D5		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	17	U	17	17	U	17	17	U	17	17	U	17
Hexachlorobenzene	28	U	28	27	U	27	28	U	28	28	U	28
Hexachlorobutadiene	9.5	U	9.5	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5
Hexachlorocyclopentadiene	48	U	48	47	U	47	48	U	48	47	U	47
Hexachloroethane	20	U	20	20	U	20	21	U	21	20	U	20
Indeno(1,2,3-cd)pyrene	32	J	21	21	U	21	21	U	21	21	U	21
Isophorone	16	U	16	16	U	16	16	U	16	16	U	16
N-Nitroso-di-n-dipropylamine	30	U	30	29	U	29	30	U	30	29	U	29
N-Nitrosodiphenylamine	21	U	21	21	U	21	21	U	21	21	U	21
Naphthalene	30	U	30	29	U	29	30	U	30	29	U	29
Nitrobenzene	20	U	20	20	U	20	20	U	20	20	U	20
Pentachlorophenol	310	U	310	310	U	310	320	U	320	310	U	310
Phenanthrene	16	U	16	16	U	16	16	U	16	16	U	16
Phenol	17	U	17	17	U	17	17	U	17	17	U	17
Pyrene	68	J	12	11	U	11	12	U	12	11	U	11

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1D6			J1FD17			J1F1D8			J1F1D9		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	9.7	U	9.7	9.5	U	9.5	9.9	U	9.9	9.9	U	9.9
Acenaphthylene	8.7	U	8.7	8.6	U	8.6	8.9	U	8.9	9	U	9
Anthracene	3	U	3	2.9	U	2.9	3	U	3	3	U	3
Benzo(a)anthracene	3.1	U	3.1	3	U	3	3.2	U	3.2	3.2	U	3.2
Benzo(a)pyrene	6.2	U	6.2	6.1	U	6.1	6.3	U	6.3	6.4	U	6.4
Benzo(b)fluoranthene	4.1	U	4.1	4	U	4	4.2	U	4.2	4.2	U	4.2
Benzo(ghi)perylene	7	U	7	6.9	U	6.9	7.1	U	7.1	7.2	U	7.2
Benzo(k)fluoranthene	3.8	U	3.8	3.8	U	3.8	3.9	U	3.9	3.9	U	3.9
Chrysene	4.7	U	4.7	4.6	U	4.6	4.8	U	4.8	4.8	U	4.8
Dibenz[a,h]anthracene	11	U	11	10	U	10	11	U	11	11	U	11
Fluoranthene	13	U	13	12	U	12	13	U	13	13	U	13
Fluorene	5.1	U	5.1	5	U	5	5.2	U	5.2	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	12	U	12	11	U	11	12	U	12	12	U	12
Naphthalene	12	U	12	11	U	11	12	U	12	12	U	12
Phenanthrene	12	U	12	11	U	11	12	U	12	12	U	12
Pyrene	12	U	12	11	U	11	12	U	12	12	U	12
PCBs												
Aroclor-1016	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	8.3	U	8.3	8.2	U	8.2	8.2	U	8.2	8.2	U	8.2
Aroclor-1232	2.1	U	2.1	2	U	2	2.1	U	2.1	2.1	U	2.1
Aroclor-1242	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8
Aroclor-1248	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8
Aroclor-1254	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Aroclor-1260	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Pesticides												
Aldrin	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.24	U	0.24
Alpha-BHC	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
alpha-Chlordane	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.67	U	0.67	0.66	U	0.66	0.66	U	0.66	0.65	U	0.65
Delta-BHC	0.4	U	0.4	0.4	U	0.4	0.4	U	0.4	0.39	U	0.39
Dichlorodiphenyldichloroethane	0.55	U	0.55	0.54	U	0.54	0.54	U	0.54	0.53	U	0.53
Dichlorodiphenyldichloroethylene	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24	0.23	U	0.23
Dichlorodiphenyltrichloroethane	0.59	U	0.59	0.59	U	0.59	0.59	U	0.59	0.58	U	0.58
Dieldrin	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.2	U	0.2
Endosulfan I	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17
Endosulfan II	0.29	U	0.29	0.29	U	0.29	0.28	U	0.28	0.28	U	0.28
Endosulfan sulfate	0.28	U	0.28	0.28	U	0.28	0.27	U	0.27	0.27	U	0.27
Endrin	0.31	U	0.31	0.31	U	0.31	0.3	U	0.3	0.3	U	0.3
Endrin aldehyde	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17
Endrin ketone	0.49	U	0.49	0.49	U	0.49	0.49	U	0.49	0.48	U	0.48
Gamma-BHC (Lindane)	0.47	U	0.47	0.46	U	0.46	0.46	U	0.46	0.45	U	0.45
gamma-Chlordane	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26
Heptachlor	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
Heptachlor epoxide	0.43	U	0.43	0.43	U	0.43	0.42	U	0.42	0.42	U	0.42
Methoxychlor	0.45	U	0.45	0.45	U	0.45	0.45	U	0.45	0.44	U	0.44
Toxaphene	16	U	16	16	U	16	16	U	16	15	U	15

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1D6			J1FD17			J1F1D8			J1F1D9		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	28	U	28	28	U	28	28	U	28	27	U	27
1,2-Dichlorobenzene	22	U	22	22	U	22	22	U	22	21	U	21
1,3-Dichlorobenzene	12	U	12	12	U	12	12	U	12	11	U	11
1,4-Dichlorobenzene	14	U	14	14	U	14	14	U	14	13	U	13
2,4,5-Trichlorophenol	10	U	10	10	U	10	10	U	10	9.6	U	9.6
2,4,6-Trichlorophenol	10	U	10	10	U	10	10	U	10	9.6	U	9.6
2,4-Dichlorophenol	10	U	10	10	U	10	10	U	10	9.6	U	9.6
2,4-Dimethylphenol	67	U	67	66	U	66	66	U	66	63	U	63
2,4-Dinitrophenol	340	U	340	330	U	330	330	U	330	320	U	320
2,4-Dinitrotoluene	67	U	67	66	U	66	66	U	66	63	U	63
2,6-Dinitrotoluene	28	U	28	28	U	28	28	U	28	27	U	27
2-Chloronaphthalene	10	U	10	10	U	10	10	U	10	9.6	U	9.6
2-Chlorophenol	21	U	21	21	U	21	21	U	21	20	U	20
2-Methylnaphthalene	19	U	19	19	U	19	19	U	19	18	U	18
2-Methylphenol (cresol, o-)	13	U	13	13	U	13	13	U	13	12	U	12
2-Nitroaniline	50	U	50	50	U	50	50	U	50	48	U	48
2-Nitrophenol	10	U	10	10	U	10	10	U	10	9.6	U	9.6
3+4 Methylphenol (cresol, m+p)	91	U	91	90	U	90	90	U	90	86	U	86
3,3'-Dichlorobenzidine	33	U	33	33	U	33	33	U	33	32	U	32
3-Nitroaniline	74	U	74	73	U	73	73	U	73	70	U	70
4,6-Dinitro-2-methylphenol	330	U	330	330	U	330	330	U	330	320	U	320
4-Bromophenylphenyl ether	19	U	19	19	U	19	19	U	19	18	U	18
4-Chloro-3-methylphenol	67	U	67	66	U	66	66	U	66	63	U	63
4-Chloroaniline	83	U	83	82	U	82	82	U	82	78	U	78
4-Chlorophenylphenyl ether	21	U	21	21	U	21	21	U	21	20	U	20
4-Nitroaniline	73	U	73	73	U	73	72	U	72	69	U	69
4-Nitrophenol	98	U	98	97	U	97	97	U	97	93	U	93
Acenaphthene	10	U	10	10	U	10	10	U	10	9.9	U	9.9
Acenaphthylene	17	U	17	17	U	17	17	U	17	16	U	16
Anthracene	17	U	17	17	U	17	17	U	17	16	U	16
Benzo(a)anthracene	20	U	20	20	U	20	20	U	20	19	U	19
Benzo(a)pyrene	20	U	20	20	U	20	20	U	20	19	U	19
Benzo(b)fluoranthene	26	U	26	26	U	26	26	U	26	25	U	25
Benzo(ghi)perylene	16	U	16	16	U	16	16	U	16	15	U	15
Benzo(k)fluoranthene	40	U	40	40	U	40	40	U	40	38	U	38
Bis(2-chloro-1-methylethyl)ether	23	U	23	23	U	23	23	U	23	22	U	22
Bis(2-Chloroethoxy)methane	23	U	23	23	U	23	23	U	23	22	U	22
Bis(2-chloroethyl) ether	17	U	17	17	U	17	17	U	17	16	U	16
Bis(2-ethylhexyl) phthalate	46	U	46	46	U	46	46	U	46	230	J	44
Butylbenzylphthalate	43	U	43	43	U	43	43	U	43	41	U	41
Carbazole	36	U	36	36	U	36	36	U	36	34	U	34
Chrysene	27	U	27	27	U	27	27	U	27	26	U	26
Di-n-butylphthalate	19	U	19	19	U	19	19	U	19	18	U	18
Di-n-octylphthalate	20	U	20	20	U	20	20	U	20	19	U	19
Dibenz[a,h]anthracene	26	U	26	26	U	26	26	U	26	25	U	25
Dibenzofuran	23	U	23	23	U	23	23	U	23	22	U	22
Diethyl phthalate	29	U	29	29	U	29	29	U	29	28	U	28
Dimethyl phthalate	15	U	15	14	U	14	14	U	14	14	U	14
Fluoranthene	36	U	36	36	U	36	36	U	36	34	U	34

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1F1D6			J1FD17			J1F1D8			J1F1D9		
	2/17/2011			2/17/2011			2/17/2011			2/17/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	18	U	18	18	U	18	18	U	18	17	U	17
Hexachlorobenzene	29	U	29	29	U	29	29	U	29	28	U	28
Hexachlorobutadiene	10	U	10	10	U	10	10	U	10	9.6	U	9.6
Hexachlorocyclopentadiene	50	U	50	50	U	50	50	U	50	48	U	48
Hexachloroethane	21	U	21	21	U	21	21	U	21	20	U	20
Indeno(1,2,3-cd)pyrene	22	U	22	22	U	22	22	U	22	21	U	21
Isophorone	17	U	17	17	U	17	17	U	17	16	U	16
N-Nitroso-di-n-dipropylamine	31	U	31	31	U	31	31	U	31	30	U	30
N-Nitrosodiphenylamine	22	U	22	22	U	22	22	U	22	21	U	21
Naphthalene	31	U	31	31	U	31	31	U	31	30	U	30
Nitrobenzene	21	U	21	21	U	21	21	U	21	20	U	20
Pentachlorophenol	330	U	330	330	U	330	330	U	330	320	U	320
Phenanthrene	17	U	17	17	U	17	17	U	17	16	U	16
Phenol	18	U	18	18	U	18	18	U	18	17	U	17
Pyrene	12	U	12	12	U	12	12	U	12	12	U	12

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1H0K9			J1H0L0			J1H0L1			J1H0L2		
	3/31/2011			3/31/2011			3/31/2011			3/31/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	9.9	U	9.9	11	U	11	10	U	10	9.9	U	9.9
Acenaphthylene	8.9	U	8.9	9.8	U	9.8	9	U	9	8.9	U	8.9
Anthracene	28		3	16	J	3.3	3	U	3	3	U	3
Benzo(a)anthracene	57	X	3.2	67		3.5	3.2	U	3.2	3.2	U	3.2
Benzo(a)pyrene	57		6.3	100		7	6.4	U	6.4	6.4	U	6.4
Benzo(b)fluoranthene	41		4.2	77		4.6	4.2	U	4.2	4.2	U	4.2
Benzo(ghi)perylene	7.1	U	7.1	26	JX	7.8	7.2	U	7.2	7.1	U	7.1
Benzo(k)fluoranthene	3.9	U	3.9	38		4.3	3.9	U	3.9	3.9	U	3.9
Chrysene	40		4.8	120		5.2	4.8	U	4.8	4.8	U	4.8
Dibenz[a,h]anthracene	11	U	11	16	JX	12	11	U	11	11	U	11
Fluoranthene	84		13	27	JX	14	13	U	13	13	U	13
Fluorene	13	J	5.2	5.7	U	5.7	5.3	U	5.3	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	12	U	12	65		13	12	U	12	12	U	12
Naphthalene	12	U	12	13	U	13	12	U	12	12	U	12
Phenanthrene	74		12	14	J	13	12	U	12	12	U	12
Pyrene	96		12	37	J	13	12	U	12	12	U	12
PCBs												
Aroclor-1016	2.7	U	2.7	2.9	U	2.9	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	7.8	U	7.8	8.3	U	8.3	8	U	8	8.2	U	8.2
Aroclor-1232	1.9	U	1.9	2.1	U	2.1	2	U	2	2	U	2
Aroclor-1242	4.5	U	4.5	4.8	U	4.8	4.7	U	4.7	4.8	U	4.8
Aroclor-1248	4.5	U	4.5	4.8	U	4.8	4.7	U	4.7	4.8	U	4.8
Aroclor-1254	2.5	U	2.5	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7
Aroclor-1260	2.5	U	2.5	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7
Pesticides												
Aldrin	0.26	U	0.26	0.37	J	0.26	0.26	U	0.26	0.26	U	0.26
Alpha-BHC	0.22	U	0.22	0.22	U	0.22	0.22	U	0.22	0.22	U	0.22
alpha-Chlordane	0.34	U	0.34	0.33	U	0.33	0.33	U	0.33	0.33	U	0.33
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.7	U	0.7	0.69	U	0.69	0.68	U	0.68	0.67	U	0.67
Delta-BHC	0.42	U	0.42	0.42	U	0.42	0.41	U	0.41	0.41	U	0.41
Dichlorodiphenyldichloroethane	0.57	U	0.57	0.57	U	0.57	0.56	U	0.56	0.55	U	0.55
Dichlorodiphenyldichloroethylene	0.29	JX	0.25	0.25	U	0.25	0.24	U	0.24	0.24	U	0.24
Dichlorodiphenyltrichloroethane	3.3		0.62	1.6	J	0.61	0.61	U	0.61	0.6	U	0.6
Dieldrin	0.22	U	0.22	0.22	U	0.22	0.22	U	0.22	0.21	U	0.21
Endosulfan I	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18
Endosulfan II	0.3	U	0.3	0.3	U	0.3	0.3	U	0.3	0.29	U	0.29
Endosulfan sulfate	0.29	U	0.29	0.29	U	0.29	0.28	U	0.28	0.28	U	0.28
Endrin	0.32	U	0.32	0.32	U	0.32	0.31	U	0.31	0.31	U	0.31
Endrin aldehyde	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18	0.17	U	0.17
Endrin ketone	0.51	U	0.51	0.51	U	0.51	0.5	U	0.5	0.5	U	0.5
Gamma-BHC (Lindane)	0.49	U	0.49	0.48	U	0.48	0.48	U	0.48	0.47	U	0.47
gamma-Chlordane	0.28	U	0.28	0.28	U	0.28	0.27	U	0.27	0.27	U	0.27
Heptachlor	0.22	U	0.22	0.22	U	0.22	0.22	U	0.22	0.22	U	0.22
Heptachlor epoxide	0.45	U	0.45	0.44	U	0.44	0.44	U	0.44	0.43	U	0.43
Methoxychlor	0.47	U	0.47	0.47	U	0.47	0.46	U	0.46	0.46	U	0.46
Toxaphene	17	U	17	16	U	16	16	U	16	16	U	16

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1H0K9			J1H0L0			J1H0L1			J1H0L2		
	3/31/2011			3/31/2011			3/31/2011			3/31/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	140	UD	140	29	U	29	29	U	29	28	U	28
1,2-Dichlorobenzene	110	UD	110	23	U	23	22	U	22	22	U	22
1,3-Dichlorobenzene	62	UD	62	13	U	13	12	U	12	12	U	12
1,4-Dichlorobenzene	70	UD	70	14	U	14	14	U	14	14	U	14
2,4,5-Trichlorophenol	51	UD	51	10	U	10	10	U	10	10	U	10
2,4,6-Trichlorophenol	51	UD	51	10	U	10	10	U	10	10	U	10
2,4-Dichlorophenol	51	UD	51	10	U	10	10	U	10	10	U	10
2,4-Dimethylphenol	340	UD	340	69	U	69	67	U	67	67	U	67
2,4-Dinitrophenol	1700	UD	1700	350	U	350	340	U	340	340	U	340
2,4-Dinitrotoluene	340	UD	340	69	U	69	67	U	67	67	U	67
2,6-Dinitrotoluene	140	UD	140	29	U	29	29	U	29	28	U	28
2-Chloronaphthalene	51	UD	51	10	U	10	10	U	10	10	U	10
2-Chlorophenol	110	UD	110	22	U	22	21	U	21	21	U	21
2-Methylnaphthalene	160	JD	98	20	U	20	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	67	UD	67	14	U	14	13	U	13	13	U	13
2-Nitroaniline	260	UD	260	52	U	52	51	U	51	50	U	50
2-Nitrophenol	51	UD	51	10	U	10	10	U	10	10	U	10
3+4 Methylphenol (cresol, m+p)	170	UD	170	35	U	35	34	U	34	33	U	33
3,3'-Dichlorobenzidine	460	UD	460	94	U	94	92	U	92	91	U	91
3-Nitroaniline	380	UD	380	76	U	76	74	U	74	74	U	74
4,6-Dinitro-2-methylphenol	1700	UD	1700	350	U	350	340	U	340	330	U	330
4-Bromophenylphenyl ether	98	UD	98	20	U	20	19	U	19	19	U	19
4-Chloro-3-methylphenol	340	UD	340	69	U	69	67	U	67	67	U	67
4-Chloroaniline	420	UD	420	86	U	86	83	U	83	83	U	83
4-Chlorophenylphenyl ether	110	UD	110	22	U	22	21	U	21	21	U	21
4-Nitroaniline	370	UD	370	76	U	76	74	U	74	73	U	73
4-Nitrophenol	500	UD	500	100	U	100	99	U	99	98	U	98
Acenaphthene	3300	D	53	11	U	11	10	U	10	10	U	10
Acenaphthylene	87	UD	87	18	U	18	17	U	17	17	U	17
Anthracene	8600	D	87	18	U	18	17	U	17	17	U	17
Benzo(a)anthracene	30000	D	100	35	J	21	20	U	20	22	J	20
Benzo(a)pyrene	26000	D	100	52	J	21	20	U	20	22	J	20
Benzo(b)fluoranthene	38000	DX	540	130	JX	27	27	U	27	79	JX	26
Benzo(ghi)perylene	13000	D	82	21	J	17	16	U	16	16	U	16
Benzo(k)fluoranthene	820	UD	820	42	U	42	41	U	41	40	U	40
Bis(2-chloro-1-methylethyl)ether	120	UD	120	24	U	24	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	120	UD	120	24	U	24	23	U	23	23	U	23
Bis(2-chloroethyl) ether	85	UD	85	17	U	17	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	240	UD	240	48	U	48	84	J	47	82	J	46
Butylbenzylphthalate	220	UD	220	45	U	45	44	U	44	43	U	43
Carbazole	1800	D	180	38	U	38	37	U	37	36	U	36
Chrysene	27000	D	140	52	J	28	28	U	28	27	U	27
Di-n-butylphthalate	150	UD	150	30	U	30	30	U	30	29	U	29
Di-n-octylphthalate	74	UD	74	15	U	15	15	U	15	15	U	15
Dibenz[a,h]anthracene	4700	D	98	20	U	20	19	U	19	19	U	19
Dibenzofuran	1000	JD	100	21	U	21	20	U	20	20	U	20
Diethyl phthalate	130	UD	130	27	U	27	26	U	26	26	U	26
Dimethyl phthalate	120	UD	120	24	U	24	23	U	23	23	U	23
Fluoranthene	79000	D	740	38	U	38	37	U	37	36	J	36

Table B-7. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1H0K9			J1H0L0			J1H0L1			J1H0L2		
	3/31/2011			3/31/2011			3/31/2011			3/31/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	2400	D	92	19	U	19	18	U	18	18	U	18
Hexachlorobenzene	150	UD	150	30	U	30	30	U	30	29	U	29
Hexachlorobutadiene	51	UD	51	10	U	10	10	U	10	10	U	10
Hexachlorocyclopentadiene	260	UD	260	52	U	52	51	U	51	50	U	50
Hexachloroethane	110	UD	110	22	U	22	22	U	22	22	U	22
Indeno(1,2,3-cd)pyrene	7700	D	110	23	J	23	22	U	22	22	U	22
Isophorone	87	UD	87	18	U	18	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	160	UD	160	32	U	32	32	U	32	31	U	31
N-Nitrosodiphenylamine	110	UD	110	22	U	22	21	U	21	21	U	21
Naphthalene	160	UD	160	32	U	32	32	U	32	31	U	31
Nitrobenzene	110	UD	110	23	U	23	22	U	22	22	U	22
Pentachlorophenol	1700	UD	1700	350	U	350	340	U	340	330	U	330
Phenanthrene	38000	D	350	18	U	18	17	U	17	17	U	17
Phenol	92	UD	92	19	U	19	18	U	18	18	U	18
Pyrene	68000	D	250	18	J	13	12	U	12	48	J	12

APPENDIX C

VERIFICATION SAMPLE RESULTS FOR THE SHORELINE SEGMENT OF THE 100-D-8 WASTE SITE

Figure C-1. Location of Sediment Samples for Shoreline Segment of the 100-D-8 Waste Site – Below the Ordinary High Water Mark.

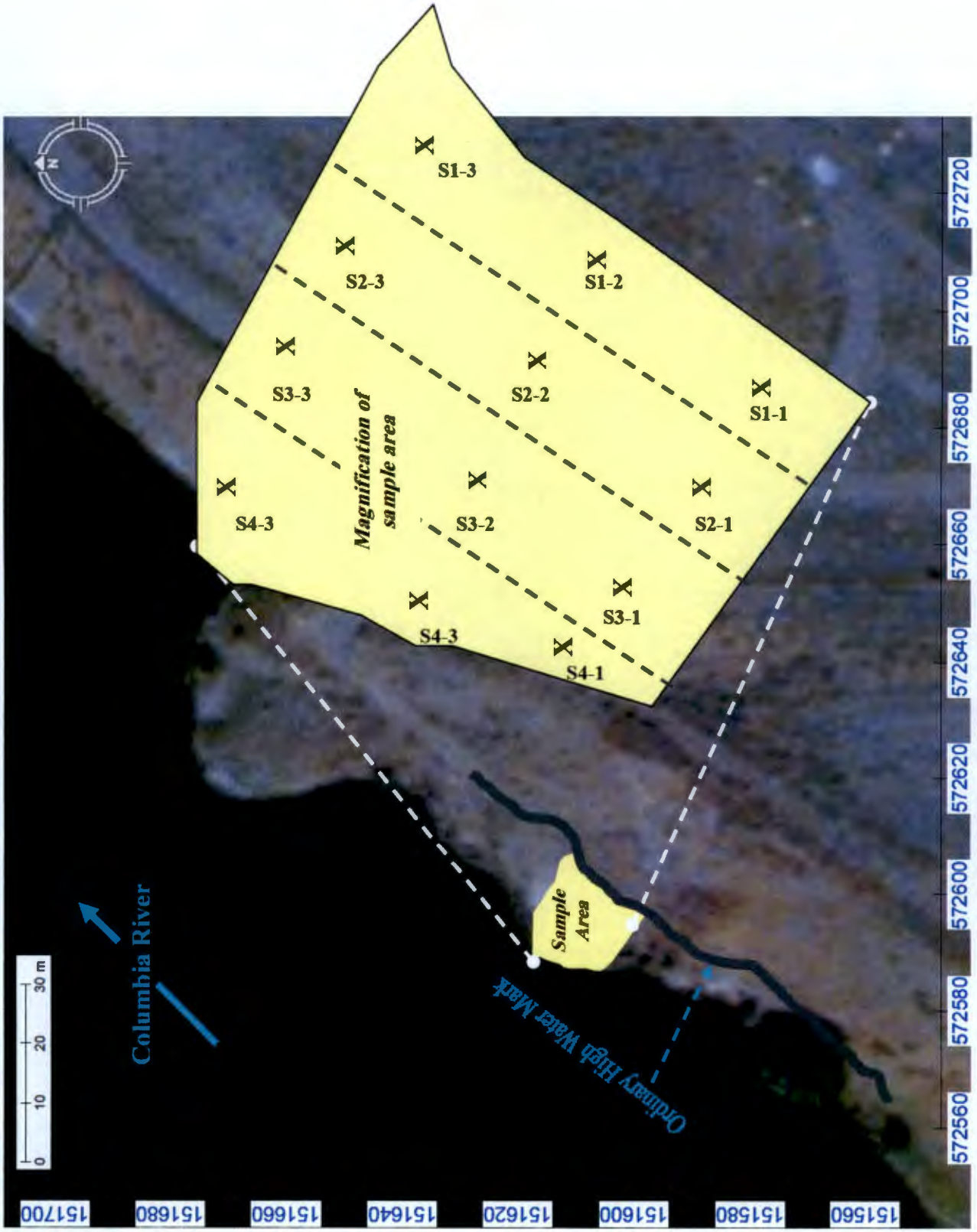


Table C-1. 100-D-8 In-process Inorganic Sample Results - Inorganics. (3 Pages)

Sample Location	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
S1-1	J1CYL8	10/30/11	6790	X	1.9	0.79		0.45	4.1		0.79	80.8	X	0.091	0.91		0.039	1.2	U	1.2
S1-2	J1CYL9	10/30/11	4970	X	1.7	0.42	U	0.42	2		0.72	76.3	X	0.083	0.93		0.036	1.1	U	1.1
S1-3	J1CYM0	10/30/11	4200	X	1.5	0.36	U	0.36	1.3		0.63	82.5	X	0.072	1.1		0.16	0.93	U	0.93
S2-1	J1CYM1	10/30/11	6900	X	1.8	0.51	B	0.43	9.5		0.75	89.5	X	0.087	0.88		0.038	1.1	U	1.1
S2-2	J1CYM2	10/30/11	5210	X	1.5	0.37	B	0.37	2.5		0.65	82.2	X	0.074	0.9		0.032	0.96	U	0.96
S2-3	J1CYM3	10/30/11	4010	X	1.5	0.36	U	0.36	1.2		0.62	55	X	0.072	1.2		0.16	0.92	U	0.92
S3-1	J1CYM4	10/30/11	6680	X	1.7	1.2		0.41	10.8		0.72	107	X	0.083	0.95		0.036	1.1	U	1.1
S3-2	J1CYM5	10/30/11	6710	X	1.8	0.45	U	0.45	3.5		0.78	79.6	X	0.09	0.93		0.039	1.2	U	1.2
S3-3	J1CYM6	10/30/11	4340	X	1.6	0.38	U	0.38	1.9		0.66	57.2	X	0.077	1.1		0.17	0.99	U	0.99
S4-1	J1CYM7	10/30/11	6550	X	1.7	0.43	U	0.43	2.9		0.74	59.1	X	0.085	0.81		0.037	1.1	U	1.1
S4-2	J1CYM8	10/30/11	6790	X	1.7	0.41	U	0.41	2.8		0.71	64.5	X	0.082	0.88		0.036	1.1	U	1.1
S4-3	J1CYM9	10/30/11	4110	X	1.5	0.36	U	0.36	1.7		0.63	70.8	X	0.073	1.2		0.16	0.94	U	0.94
Duplicate J1CYM7	J1CYN0	10/30/11	5950	X	1.8	0.48	B	0.43	3.2		0.75	68	X	0.086	0.89		0.037	1.1	U	1.1
Equipment Blank	J1CYN2	10/30/11	266	X	1.4	0.33	U	0.33	0.58	B	0.58	2.5	X	0.067	0.047	B	0.029	0.86	U	0.86

Acronyms and notes apply to all of the tables in this appendix.

B = Detected below reporting limit
C = detected in sample and in blank
D = diluted
EB = equipment blank
J = estimate
MDA = mimimum detectable activity
NA = not analyzed
Q = qualifier
PQL = practical quantitation limit
U = undetected
R = rejected
X = physical and chemical interference present

Table C-1. 100-D-8 In-process Inorganic Sample Results - Inorganics. (3 Pages)

Sample Location	Sample Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Hexavalent Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
S1-1	J1CYL8	10/30/11	0.79		0.049	5590	X	16.9	23.9	X	0.069	9.2	X	0.12	25.4		0.26	0.236		0.155
S1-2	J1CYL9	10/30/11	0.11	B	0.045	4340	X	15.5	6.1	X	0.064	7.8	X	0.11	14		0.24	0.155	U	0.155
S1-3	J1CYM0	10/30/11	0.2	U	0.2	4540	X	13.4	3.4	X	0.055	9.8	X	0.48	15.8		1	0.155	U	0.155
S2-1	J1CYM1	10/30/11	1.1		0.047	24600	X	16.1	19.3	X	0.066	7.7	X	0.11	23.8		0.25	0.155	U	0.155
S2-2	J1CYM2	10/30/11	0.52		0.04	4220	X	13.8	16.1	X	0.057	7.5	X	0.098	14.8		0.21	0.155	U	0.155
S2-3	J1CYM3	10/30/11	0.19	U	0.19	4650	X	13.3	4	X	0.055	10.1	X	0.47	14.4		1	0.155	U	0.155
S3-1	J1CYM4	10/30/11	2.8		0.045	6060	X	15.3	36.6	X	0.063	9.1	X	0.11	41.5		0.24	0.155	U	0.155
S3-2	J1CYM5	10/30/11	1.2		0.048	5110	X	16.6	25.3	X	0.068	8.7	X	0.12	20		0.26	0.155	U	0.155
S3-3	J1CYM6	10/30/11	0.21	U	0.21	4740	X	14.2	5.4	X	0.058	9.8	X	0.5	15.3		1.1	0.155	U	0.155
S4-1	J1CYM7	10/30/11	0.7		0.046	4690	X	15.8	27.8	X	0.065	8	X	0.11	18.6		0.24	0.727		0.155
S4-2	J1CYM8	10/30/11	0.81		0.044	4970	X	15.2	29.3	X	0.063	8.7	X	0.11	20.2		0.23	0.379		0.155
S4-3	J1CYM9	10/30/11	0.21	B	0.2	4680	X	13.5	4.5	X	0.055	10	X	0.48	15.3		1	0.155	U	0.155
Duplicate J1CYM7	J1CYN0	10/30/11	0.82		0.046	4530	X	16	27	X	0.066	8	X	0.11	17.4		0.25	0.759		0.155
Equipment Blank	J1CYN2	10/30/11	0.036	U	0.036	50.3	X	12.4	0.33	X	0.051	0.17	B X	0.088	0.3	B	0.19	NA		

Sample Location	Sample Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Molybdenum		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
S1-1	J1CYL8	10/30/11	24600	X	4.5	25.5	X	0.32	5040	X	4.4	348	X	0.12	0.26	N	0.006	0.31	U	0.31
S1-2	J1CYL9	10/30/11	22100	X	4.2	8.6	X	0.3	3820	X	4.1	281	X	0.11	0.016	B	0.006	0.29	U	0.29
S1-3	J1CYM0	10/30/11	21700	X	3.6	3.4	X	1.3	3680	X	3.5	365	X	0.095	0.0053	U	0.005	0.25	U	0.25
S2-1	J1CYM1	10/30/11	22800	X	4.3	20.5	X	0.31	5840	X	4.2	348	X	0.11	0.27		0.006	0.35	B	0.3
S2-2	J1CYM2	10/30/11	22000	X	3.7	13.1	X	0.26	3640	X	3.6	313	X	0.098	0.088		0.006	0.25	U	0.25
S2-3	J1CYM3	10/30/11	24400	X	3.6	2.7	X	1.3	4100	X	3.5	280	X	0.094	0.0056	U	0.006	0.25	B	0.24
S3-1	J1CYM4	10/30/11	25600	X	4.1	31.2	X	0.29	5080	X	4	518	X	0.11	0.83		0.006	2.2		0.28
S3-2	J1CYM5	10/30/11	23900	X	4.5	26.1	X	0.32	4600	X	4.4	359	X	0.12	0.18		0.006	0.31	B	0.31
S3-3	J1CYM6	10/30/11	23600	X	3.8	4.5	X	1.4	4130	X	3.7	298	X	0.1	0.0053	U	0.005	0.26	U	0.26
S4-1	J1CYM7	10/30/11	24300	X	4.3	13.4	X	0.3	4450	X	4.1	369	X	0.11	0.1		0.006	0.29	U	0.29
S4-2	J1CYM8	10/30/11	23200	X	4.1	14.5	X	0.29	4080	X	4	353	X	0.11	0.18		0.006	0.28	U	0.28
S4-3	J1CYM9	10/30/11	24600	X	3.6	3.6	X	1.3	3920	X	3.5	308	X	0.096	0.0056	U	0.006	0.25	U	0.25
Duplicate J1CYM7	J1CYN0	10/30/11	22800	X	4.3	15.4	X	0.31	4250	X	4.2	356	X	0.11	0.11		0.006	0.29	U	0.29
Equipment Blank	J1CYN2	10/30/11	620	X	3.3	0.53	X	0.24	36.4	X	3.2	6.1	X	0.088	0.0051	U	0.005	0.23	U	0.23

Table C-1. 100-D-8 In-process Inorganic Sample Results - Inorganics. (3 Pages)

Sample Location	Sample Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
S1-1	J1CYL8	10/30/11	12.2	X	0.15	648		49	1	U	1	270		6.8	0.19	U	0.19	409		70.5
S1-2	J1CYL9	10/30/11	8.9	X	0.13	511		45	0.94	U	0.94	195		6.2	0.18	U	0.18	258		64.7
S1-3	J1CYM0	10/30/11	7.9	X	0.12	379		39	0.82	U	0.82	144		5.4	0.15	U	0.15	364		56.1
S2-1	J1CYM1	10/30/11	11.3	X	0.14	694		46.9	0.98	U	0.98	287		6.5	0.18	U	0.18	308		67.4
S2-2	J1CYM2	10/30/11	9.7	X	0.12	557		40.1	0.84	U	0.84	188		5.5	0.16	U	0.16	232		57.7
S2-3	J1CYM3	10/30/11	8.5	X	0.12	345		38.6	0.81	U	0.81	160		5.3	0.15	U	0.15	288		55.5
S3-1	J1CYM4	10/30/11	13.1	X	0.13	536		44.6	0.94	U	0.94	221		6.2	0.17	U	0.17	308		64.2
S3-2	J1CYM5	10/30/11	12.8	X	0.14	658		48.3	1	U	1	206		6.7	0.19	U	0.19	380		69.5
S3-3	J1CYM6	10/30/11	10.1	X	0.12	368		41.3	0.87	U	0.87	153		5.7	0.16	U	0.16	309		59.4
S4-1	J1CYM7	10/30/11	10.6	X	0.14	668		46	0.96	U	0.96	216		6.3	0.18	U	0.18	280		66.1
S4-2	J1CYM8	10/30/11	10.6	X	0.13	733		44.3	0.93	U	0.93	242		6.1	0.17	U	0.17	434		63.7
S4-3	J1CYM9	10/30/11	7.7	X	0.12	370		39.2	0.82	U	0.82	153		5.4	0.15	U	0.15	283		56.4
Duplicate J1CYM7	J1CYN0	10/30/11	12.1	X	0.14	632		46.4	0.97	U	0.97	241		6.4	0.18	U	0.18	287		66.8
Equipment Blank	J1CYN2	10/30/11	0.24	BX	0.11	68.5	B	36	0.75	U	0.75	108		5	0.14	U	0.14	51.8	U	51.8

Sample Location	Sample Number	Sample Date	Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL
S1-1	J1CYL8	10/30/11	65.8		0.11	126	X	0.48
S1-2	J1CYL9	10/30/11	68.1		0.1	47.2	X	0.44
S1-3	J1CYM0	10/30/11	78		0.45	39.8	X	0.38
S2-1	J1CYM1	10/30/11	59.3		0.11	146	X	0.45
S2-2	J1CYM2	10/30/11	64.1		0.092	73.6	X	0.39
S2-3	J1CYM3	10/30/11	84.5		0.44	42.9	X	0.37
S3-1	J1CYM4	10/30/11	67		0.1	286	X	0.43
S3-2	J1CYM5	10/30/11	66.2		0.11	154	X	0.47
S3-3	J1CYM6	10/30/11	80.7		0.47	46.4	X	0.4
S4-1	J1CYM7	10/30/11	62.7		0.11	115	X	0.45
S4-2	J1CYM8	10/30/11	61.4		0.1	107	X	0.43
S4-3	J1CYM9	10/30/11	85.3		0.45	51.5	X	0.38
Duplicate J1CYM7	J1CYN0	10/30/11	66.6		0.11	135	X	0.45
Equipment Blank	J1CYN2	10/30/11	0.72	B	0.083	1.7	X	0.35

Table C-2. 100-D-8 In-process Sample Results - Radionuclides. (2 Pages)

Sample Location	Sample Number	Sample Date	Americium-241 GEA			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
S1-1	J1CYL8	10/30/11	-0.0915	U	0.138	0.443		0.0323	0.07	U	0.0446	0.795		0.088	0.0849	U	0.114	0.078	U	0.116
S1-2	J1CYL9	10/30/11	-0.0395	U	0.141	0.0177	U	0.0256	0.007	U	0.0261	0.0328	U	0.061	-0.0018	U	0.085	0.038	U	0.065
S1-3	J1CYM0	10/30/11	-0.0187	U	0.0641	-0.018	U	0.0386	-0.005	U	0.0366	0.0075	U	0.098	-0.0194	U	0.111	0.006	U	0.094
S2-1	J1CYM1	10/30/11	-0.0275	U	0.146	0.651		0.0392	0.911		0.0295	0.814		0.118	0.128	U	0.13	-0.018	U	0.119
S2-2	J1CYM2	10/30/11	-0.0126	U	0.125	0.104		0.0378	0.019	U	0.046	0.309		0.11	0.0137	U	0.128	0.033	U	0.0968
S2-3	J1CYM3	10/30/11	-0.0223	U	0.0671	0.0031	U	0.0409	-0.009	U	0.0373	0.0032	U	0.103	0.0317	U	0.126	-0.007	U	0.097
S3-1	J1CYM4	10/30/11	0.0538	U	0.17	0.447		0.0279	0.127		0.0244	0.674		0.066	0.0464	U	0.104	0.07	U	0.0779
S3-2	J1CYM5	10/30/11	0.211	U	0.312	0.521		0.0368	0.07	U	0.0481	1.07		0.085	0.234	U	0.145	0.037	U	0.11
S3-3	J1CYM6	10/30/11	-0.0319	U	0.119	-9E-04	U	0.0286	-0.001	U	0.0296	0.0155	U	0.081	0.0072	U	0.098	-0.005	U	0.0907
S4-1	J1CYM7	10/30/11	-0.008	U	0.148	0.519		0.0457	0.162		0.0409	1.95		0.117	0.39	U	0.203	0.129	U	0.132
S4-2	J1CYM8	10/30/11	0.0066	U	0.0821	0.446		0.049	0.179	U	0.0729	1.33		0.125	0.135	U	0.163	0.028	U	0.131
S4-3	J1CYM9	10/30/11	-0.104	U	0.257	0.0365	U	0.0368	0.008	U	0.0333	0.0019	U	0.08	-0.0514	U	0.094	-0.015	U	0.0896
Duplicate J1CYM7	J1CYN0	10/30/11	-0.005	U	0.13	0.251		0.0299	0.073	U	0.0415	0.552		0.09	0.246	U	0.134	0.004	U	0.105

Sample Location	Sample Number	Sample Date	Carbon-14			Nickel-63			Plutonium-238			Plutonium-239/240			Total Beta Radiostrontium			Technicium-99		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
S1-1	J1CYL8	10/30/11	0.268	U	0.463	12.1	U	13.1	-0.005	U	0.154	0.0666	U	0.128	0.0796	U	0.163	0.112	U	0.636
S1-2	J1CYL9	10/30/11	0.256	U	0.465	-7.06	U	13.8	-0.005	U	0.206	-0.0074	U	0.223	0.0417	U	0.18	0.204	U	0.633
S1-3	J1CYM0	10/30/11	0.134	U	0.465	-4.29	U	13.8	0	U	0.121	-0.0032	U	0.135	-0.0544	U	0.19	0.107	U	0.633
S2-1	J1CYM1	10/30/11	0.372	U	0.465	36.1		14.4	-0.003	U	0.113	0.0759	U	0.13	0.121	U	0.177	0.188	U	0.634
S2-2	J1CYM2	10/30/11	0.157	U	0.465	-2.33	U	13.2	0.034	U	0.129	0	U	0.129	0.0346	U	0.187	-0.028	U	0.633
S2-3	J1CYM3	10/30/11	0.162	U	0.464	-1.67	U	12.1	-0.001	U	0.107	-0.0043	U	0.128	0.0449	U	0.19	0.073	U	0.638
S3-1	J1CYM4	10/30/11	0.34	U	0.464	5.97	U	13.4	0	U	0.152	0.203		0.152	0.123	U	0.195	0.133	U	0.632
S3-2	J1CYM5	10/30/11	0.134	U	0.466	4.24	U	13	0.038	U	0.15	0.0399	U	0.15	0.703		0.177	-0.045	U	0.629
S3-3	J1CYM6	10/30/11	0.281	U	0.466	1.16	U	12.6	-0.002	U	0.121	-0.0048	U	0.145	0.0195	U	0.167	-0.016	U	0.637
S4-1	J1CYM7	10/30/11	0.0521	U	0.467	18.3		12.1	0.033	U	0.123	0.0296	U	0.137	0.0143	U	0.168	0.363	U	0.628
S4-2	J1CYM8	10/30/11	0.261	U	0.466	15		13.9	-0.003	U	0.116	0.0511	U	0.125	0.0712	U	0.192	0.273	U	0.632
S4-3	J1CYM9	10/30/11	0.0077	U	0.466	1.16	U	12.6	0	U	0.126	0	U	0.126	0.0812	U	0.181	0.214	U	0.631
Duplicate J1CYM7	J1CYN0	10/30/11	0.277	U	0.463	6.18	U	12.5	-0.002	U	0.112	-0.0045	U	0.135	0.0602	U	0.166	0.171	U	0.634

Table C-2. 100-D-8 In-process Sample Results - Radionuclides. (2 Pages)

Sample Location	Sample Number	Sample Date	Tritium			Uranium-234			Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
S1-1	J1CYL8	10/30/11	0.0145	U	0.0504	0.449		0.163	0.041	U	0.146	0.477		0.155
S1-2	J1CYL9	10/30/11	0.013	U	0.03	0.134	U	0.146	-0.001	U	0.0914	0.161		0.138
S1-3	J1CYM0	10/30/11	0.0055	U	0.0213	0.141		0.0879	0	U	0.0879	0.164		0.088
S2-1	J1CYM1	10/30/11	0.0379	U	0.0601	0.446		0.104	0.025	U	0.0934	0.471		0.104
S2-2	J1CYM2	10/30/11	0.0032	U	0.0408	0.282		0.108	0.052	U	0.0969	0.439		0.097
S2-3	J1CYM3	10/30/11	0.0024	U	0.0208	0.0954	U	0.0906	0.048	U	0.0906	0.167		0.101
S3-1	J1CYM4	10/30/11	0.0202	U	0.0497	0.465		0.109	0.078	U	0.0974	0.465		0.109
S3-2	J1CYM5	10/30/11	0.0265	U	0.0675	0.798		0.135	0.044	U	0.146	0.741		0.146
S3-3	J1CYM6	10/30/11	0.0105	U	0.0221	0.284		0.157	-0.009	U	0.147	0.289		0.136
S4-1	J1CYM7	10/30/11	0.0403	U	0.0622	0.664		0.155	-0.001	U	0.0941	0.241		0.142
S4-2	J1CYM8	10/30/11	0.0235	U	0.0526	0.645		0.0864	0.046	U	0.0864	0.323		0.086
S4-3	J1CYM9	10/30/11	0.0069	U	0.0218	0.387		0.102	0.024	U	0.0912	0.239		0.11
Duplicate J1CYM7	J1CYN0	10/30/11	0.0286	U	0.053	0.415		0.0919	0	U	0.0919	0.365		0.102

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYL8			J1CYL9			J1CYM0			J1CYM1		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	64	JX	12	11	U	11	10	U	10	930	X	12
Acenaphthylene	11	U	11	9.6	U	9.6	9.1	U	9.1	11	U	11
Anthracene	3.6	U	3.6	3.2	U	3.2	3.1	U	3.1	3.7	U	3.7
Benzo(a)anthracene	9.1	J	3.8	3.4	U	3.4	3.2	U	3.2	9.9	J	3.9
Benzo(a)pyrene	18		7.6	6.8	U	6.8	6.5	U	6.5	39	X	7.8
Benzo(b)fluoranthene	5	U	5	4.5	U	4.5	4.3	U	4.3	5.1	U	5.1
Benzo(ghi)perylene	8.5	U	8.5	7.6	U	7.6	7.3	U	7.3	8.7	U	8.7
Benzo(k)fluoranthene	4.7	U	4.7	4.2	U	4.2	4	U	4	4.8	U	4.8
Chrysene	10	J	5.7	5.1	U	5.1	4.9	U	4.9	8.1	J	5.9
Dibenz[a,h]anthracene	13	U	13	12	U	12	11	U	11	13	U	13
Fluoranthene	20	J	15	14	U	14	13	U	13	16	U	16
Fluorene	6.3	U	6.3	5.6	U	5.6	5.4	U	5.4	6.4	U	6.4
Indeno(1,2,3-cd)pyrene	14	U	14	13	U	13	12	U	12	15	U	15
Naphthalene	14	U	14	13	U	13	12	U	12	15	U	15
Phenanthrene	24	J	14	13	U	13	12	U	12	15	U	15
Pyrene	18	JX	14	13	U	13	12	U	12	16	JX	15
PCBs												
Aroclor-1016	3.3	U	3.3	3	U	3	2.9	U	2.9	3.4	U	3.4
Aroclor-1221	9.5	U	9.5	8.7	U	8.7	8.3	U	8.3	9.7	U	9.7
Aroclor-1232	2.4	U	2.4	2.2	U	2.2	2.1	U	2.1	2.4	U	2.4
Aroclor-1242	5.5	U	5.5	5.1	U	5.1	4.8	U	4.8	5.7	U	5.7
Aroclor-1248	5.5	U	5.5	5.1	U	5.1	4.8	U	4.8	5.7	U	5.7
Aroclor-1254	3.1	U	3.1	2.8	U	2.8	2.7	U	2.7	3.2	U	3.2
Aroclor-1260	3.1	U	3.1	2.8	U	2.8	2.7	U	2.7	3.2	U	3.2
Pesticides												
Aldrin	0.31	U	0.31	0.27	U	0.27	0.25	U	0.25	0.3	U	0.3
Alpha-BHC	0.27	U	0.27	0.23	U	0.23	0.21	U	0.21	0.25	U	0.25
alpha-Chlordane	0.4	U	0.4	0.35	U	0.35	0.32	U	0.32	0.38	U	0.38
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.83	U	0.83	0.72	U	0.72	0.66	U	0.66	0.79	U	0.79
Delta-BHC	0.5	U	0.5	0.44	U	0.44	0.4	U	0.4	0.48	U	0.48
Dichlorodiphenyldichloroethane	0.68	U	0.68	0.59	U	0.59	0.54	U	0.54	0.65	U	0.65
Dichlorodiphenyldichloroethylene	0.37	J	0.3	0.26	U	0.26	0.24	U	0.24	0.43	J	0.28
Dichlorodiphenyltrichloroethane	7.4	UD	7.4	0.64	U	0.64	0.59	U	0.59	7	U	7
Dieldrin	0.26	U	0.26	0.23	U	0.23	0.21	U	0.21	0.25	U	0.25
Endosulfan I	0.22	U	0.22	0.19	U	0.19	0.17	U	0.17	0.21	U	0.21
Endosulfan II	0.36	U	0.36	0.31	U	0.31	0.29	U	0.29	0.34	U	0.34
Endosulfan sulfate	0.34	U	0.34	0.3	U	0.3	0.27	U	0.27	0.33	U	0.33
Endrin	0.38	U	0.38	0.33	U	0.33	0.3	U	0.3	0.36	U	0.36
Endrin aldehyde	0.21	U	0.21	0.19	U	0.19	0.17	U	0.17	0.2	U	0.2
Endrin ketone	0.61	U	0.61	0.53	U	0.53	0.49	U	0.49	0.58	U	0.58
Gamma-BHC (Lindane)	0.58	U	0.58	0.5	U	0.5	0.46	U	0.46	0.55	U	0.55
gamma-Chlordane	0.33	U	0.33	0.29	U	0.29	0.26	U	0.26	0.32	U	0.32
Heptachlor	0.27	U	0.27	0.23	U	0.23	0.21	U	0.21	0.25	U	0.25
Heptachlor epoxide	0.53	U	0.53	0.46	U	0.46	0.42	U	0.42	0.51	U	0.51
Methoxychlor	5.6	UD	5.6	0.49	U	0.49	0.45	U	0.45	5.4	U	5.4
Toxaphene	20	U	20	17	U	17	16	U	16	19	U	19

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYL8			J1CYL9			J1CYM0			J1CYM1		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	35	U	35	31	U	31	28	U	28	33	U	33
1,2-Dichlorobenzene	27	U	27	24	U	24	22	U	22	26	U	26
1,3-Dichlorobenzene	15	U	15	13	U	13	12	U	12	14	U	14
1,4-Dichlorobenzene	17	U	17	15	U	15	14	U	14	16	U	16
2,4,5-Trichlorophenol	12	U	12	11	U	11	10	U	10	12	U	12
2,4,6-Trichlorophenol	12	U	12	11	U	11	10	U	10	12	U	12
2,4-Dichlorophenol	12	U	12	11	U	11	10	U	10	12	U	12
2,4-Dimethylphenol	82	U	82	72	U	72	66	U	66	77	U	77
2,4-Dinitrophenol	420	U	420	360	U	360	330	U	330	390	U	390
2,4-Dinitrotoluene	82	U	82	72	U	72	66	U	66	77	U	77
2,6-Dinitrotoluene	35	U	35	31	U	31	28	U	28	33	U	33
2-Chloronaphthalene	12	U	12	11	U	11	10	U	10	12	U	12
2-Chlorophenol	26	U	26	23	U	23	21	U	21	25	U	25
2-Methylnaphthalene	24	U	24	21	U	21	19	U	19	22	U	22
2-Methylphenol (cresol, o-)	16	U	16	14	U	14	13	U	13	15	U	15
2-Nitroaniline	62	U	62	54	U	54	50	U	50	59	U	59
2-Nitrophenol	12	U	12	11	U	11	10	U	10	12	U	12
3+4 Methylphenol (cresol, m+p)	41	U	41	36	U	36	33	U	33	39	U	39
3,3'-Dichlorobenzidine	110	U	110	98	U	98	90	U	90	110	U	110
3-Nitroaniline	91	U	91	80	U	80	73	U	73	86	U	86
4,6-Dinitro-2-methylphenol	410	U	410	360	U	360	330	U	330	390	U	390
4-Bromophenylphenyl ether	24	U	24	21	U	21	19	U	19	22	U	22
4-Chloro-3-methylphenol	82	U	82	72	U	72	66	U	66	77	U	77
4-Chloroaniline	100	U	100	89	U	89	82	U	82	96	U	96
4-Chlorophenylphenyl ether	26	U	26	23	U	23	21	U	21	25	U	25
4-Nitroaniline	90	U	90	79	U	79	72	U	72	85	U	85
4-Nitrophenol	120	U	120	110	U	110	97	U	97	110	U	110
Acenaphthene	13	U	13	11	U	11	10	U	10	12	U	12
Acenaphthylene	21	U	21	19	U	19	17	U	17	20	U	20
Anthracene	21	U	21	19	U	19	17	U	17	20	U	20
Benzo(a)anthracene	150	J	25	22	U	22	20	U	20	23	U	23
Benzo(a)pyrene	210	J	25	22	U	22	20	U	20	23	U	23
Benzo(b)fluoranthene	220	JK	33	29	U	29	26	U	26	31	U	31
Benzo(ghi)perylene	74	J	20	17	U	17	16	U	16	19	U	19
Benzo(k)fluoranthene	50	UK	50	44	U	44	40	U	40	47	U	47
Bis(2-chloro-1-methylethyl)ether	29	U	29	25	U	25	23	U	23	27	U	27
Bis(2-Chloroethoxy)methane	29	U	29	25	U	25	23	U	23	27	U	27
Bis(2-chloroethyl) ether	21	U	21	18	U	18	17	U	17	19	U	19
Bis(2-ethylhexyl) phthalate	120	JB	57	94	JB	50	87	JB	46	150	JB	54
Butylbenzylphthalate	54	U	54	47	U	47	43	U	43	50	U	50
Carbazole	45	U	45	39	U	39	36	U	36	42	U	42
Chrysene	150	J	34	29	U	29	27	U	27	32	U	32
Di-n-butylphthalate	36	U	36	32	U	32	29	U	29	34	U	34
Di-n-octylphthalate	18	U	18	16	U	16	14	U	14	17	U	17
Dibenz[a,h]anthracene	24	U	24	21	U	21	19	U	19	22	U	22
Dibenzofuran	25	U	25	22	U	22	20	U	20	23	U	23
Diethyl phthalate	32	U	32	28	U	28	26	U	26	30	U	30
Dimethyl phthalate	29	U	29	25	U	25	170	J	23	27	U	27
Fluoranthene	240	J	45	39	U	39	36	U	36	42	U	42

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYL8			J1CYL9			J1CYM0			J1CYM1		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	22	U	22	20	U	20	18	U	18	21	U	21
Hexachlorobenzene	36	U	36	32	U	32	29	U	29	34	U	34
Hexachlorobutadiene	12	U	12	11	U	11	10	U	10	12	U	12
Hexachlorocyclopentadiene	62	U	62	54	U	54	50	U	50	59	U	59
Hexachloroethane	27	U	27	23	U	23	21	U	21	25	U	25
Indeno(1,2,3-cd)pyrene	65	J	27	24	U	24	22	U	22	26	U	26
Isophorone	21	U	21	19	U	19	17	U	17	20	U	20
N-Nitroso-di-n-dipropylamine	39	U	39	34	U	34	31	U	31	36	U	36
N-Nitrosodiphenylamine	26	U	26	23	U	23	21	U	21	25	U	25
Naphthalene	39	U	39	34	U	34	31	U	31	36	U	36
Nitrobenzene	27	U	27	24	U	24	22	U	22	26	U	26
Pentachlorophenol	410	U	410	360	U	360	330	U	330	390	U	390
Phenanthrene	36	J	21	19	U	19	17	U	17	20	U	20
Phenol	37	J	22	27	J	20	18	U	18	38	J	21
Pyrene	230	J	15	13	U	13	12	U	12	14	U	14

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYM2			J1CYM3			J1CYM4			J1CYM5		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	2700	X	11	10	U	10	11	U	11	12	U	12
Acenaphthylene	9.7	U	9.7	9	U	9	9.9	U	9.9	10	U	10
Anthracene	3.3	U	3.3	3.1	U	3.1	3.4	U	3.4	3.5	U	3.5
Benzo(a)anthracene	3.5	U	3.5	3.2	U	3.2	3.5	U	3.5	3.7	U	3.7
Benzo(a)pyrene	27		6.9	6.4	U	6.4	7	U	7	15	J	7.4
Benzo(b)fluoranthene	20		4.5	4.2	U	4.2	5.9	J	4.6	6.1	J	4.8
Benzo(ghi)perylene	7.8	U	7.8	7.2	U	7.2	7.9	U	7.9	8.3	U	8.3
Benzo(k)fluoranthene	9.9	J	4.3	4	U	4	4.3	U	4.3	4.5	U	4.5
Chrysene	18	J	5.2	4.9	U	4.9	5.3	U	5.3	6	JX	5.6
Dibenz[a,h]anthracene	12	U	12	11	U	11	12	U	12	13	U	13
Fluoranthene	17	JX	14	13	U	13	14	U	14	15	U	15
Fluorene	5.7	U	5.7	5.3	U	5.3	5.8	U	5.8	6.1	U	6.1
Indeno(1,2,3-cd)pyrene	20	J	13	12	U	12	13	U	13	14	U	14
Naphthalene	13	U	13	12	U	12	13	U	13	14	U	14
Phenanthrene	13	U	13	12	U	12	13	U	13	27	J	14
Pyrene	27	JX	13	12	U	12	13	U	13	14	U	14
PCBs												
Aroclor-1016	3.1	U	3.1	2.9	U	2.9	3.2	U	3.2	3.2	U	3.2
Aroclor-1221	8.9	U	8.9	8.4	U	8.4	9.2	U	9.2	9.3	U	9.3
Aroclor-1232	2.2	U	2.2	2.1	U	2.1	2.3	U	2.3	2.3	U	2.3
Aroclor-1242	5.2	U	5.2	4.9	U	4.9	5.3	U	5.3	5.4	U	5.4
Aroclor-1248	5.2	U	5.2	4.9	U	4.9	5.3	U	5.3	5.4	U	5.4
Aroclor-1254	2.9	U	2.9	2.7	U	2.7	3	U	3	6.9	J	3
Aroclor-1260	2.9	U	2.9	2.7	U	2.7	3	U	3	3	U	3
Pesticides												
Aldrin	0.28	U	0.28	0.26	U	0.26	0.29	U	0.29	0.29	U	0.29
Alpha-BHC	0.24	U	0.24	0.22	U	0.22	0.24	U	0.24	0.25	U	0.25
alpha-Chlordane	0.37	U	0.37	0.34	U	0.34	0.37	U	0.37	0.38	U	0.38
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.75	U	0.75	0.7	U	0.7	0.76	U	0.76	0.78	U	0.78
Delta-BHC	0.45	U	0.45	0.42	U	0.42	0.46	U	0.46	0.47	U	0.47
Dichlorodiphenyldichloroethane	0.62	U	0.62	0.57	U	0.57	0.62	U	0.62	0.64	U	0.64
Dichlorodiphenyldichloroethylene	0.27	U	0.27	0.25	U	0.25	0.27	U	0.27	0.31	J	0.28
Dichlorodiphenyltrichloroethane	0.67	U	0.67	0.62	U	0.62	1.4	J	0.67	1.1	J	0.69
Dieldrin	0.24	U	0.24	0.22	U	0.22	0.24	U	0.24	0.25	U	0.25
Endosulfan I	0.2	U	0.2	0.18	U	0.18	0.2	U	0.2	0.21	U	0.21
Endosulfan II	0.32	U	0.32	0.3	U	0.3	0.33	U	0.33	0.34	U	0.34
Endosulfan sulfate	0.31	U	0.31	0.29	U	0.29	0.31	U	0.31	0.32	U	0.32
Endrin	0.35	U	0.35	0.32	U	0.32	0.35	U	0.35	0.36	U	0.36
Endrin aldehyde	0.19	U	0.19	0.18	U	0.18	0.19	U	0.19	0.2	U	0.2
Endrin ketone	0.55	U	0.55	0.51	U	0.51	0.56	U	0.56	0.57	U	0.57
Gamma-BHC (Lindane)	0.53	U	0.53	0.49	U	0.49	0.53	U	0.53	0.55	U	0.55
gamma-Chlordane	0.3	U	0.3	0.28	U	0.28	0.3	U	0.3	0.31	U	0.31
Heptachlor	0.24	U	0.24	0.22	U	0.22	0.24	U	0.24	0.25	U	0.25
Heptachlor epoxide	0.48	U	0.48	0.45	U	0.45	0.48	U	0.48	0.5	U	0.5
Methoxychlor	0.51	U	0.51	0.47	U	0.47	0.51	U	0.51	0.53	U	0.53
Toxaphene	18	U	18	17	U	17	18	U	18	19	U	19

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYM2			J1CYM3			J1CYM4			J1CYM5		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	31	U	31	28	U	28	32	U	32	33	U	33
1,2-Dichlorobenzene	24	U	24	22	U	22	25	U	25	26	U	26
1,3-Dichlorobenzene	13	U	13	12	U	12	14	U	14	14	U	14
1,4-Dichlorobenzene	15	U	15	14	U	14	16	U	16	16	U	16
2,4,5-Trichlorophenol	11	U	11	10	U	10	12	U	12	12	U	12
2,4,6-Trichlorophenol	11	U	11	10	U	10	12	U	12	12	U	12
2,4-Dichlorophenol	11	U	11	10	U	10	12	U	12	12	U	12
2,4-Dimethylphenol	73	U	73	66	U	66	76	U	76	78	U	78
2,4-Dinitrophenol	370	U	370	330	U	330	380	U	380	390	U	390
2,4-Dinitrotoluene	73	U	73	66	U	66	76	U	76	78	U	78
2,6-Dinitrotoluene	31	U	31	28	U	28	32	U	32	33	U	33
2-Chloronaphthalene	11	U	11	10	U	10	12	U	12	12	U	12
2-Chlorophenol	23	U	23	21	U	21	24	U	24	25	U	25
2-Methylnaphthalene	21	U	21	19	U	19	22	U	22	23	U	23
2-Methylphenol (cresol, o-)	14	U	14	13	U	13	15	U	15	15	U	15
2-Nitroaniline	55	U	55	50	U	50	58	U	58	59	U	59
2-Nitrophenol	11	U	11	10	U	10	12	U	12	12	U	12
3+4 Methylphenol (cresol, m+p)	37	U	37	33	U	33	38	U	38	39	U	39
3,3'-Dichlorobenzidine	100	U	100	90	U	90	100	U	100	110	U	110
3-Nitroaniline	81	U	81	73	U	73	84	U	84	87	U	87
4,6-Dinitro-2-methylphenol	370	U	370	330	U	330	380	U	380	390	U	390
4-Bromophenylphenyl ether	21	U	21	19	U	19	22	U	22	23	U	23
4-Chloro-3-methylphenol	73	U	73	66	U	66	76	U	76	78	U	78
4-Chloroaniline	91	U	91	82	U	82	94	U	94	97	U	97
4-Chlorophenylphenyl ether	23	U	23	21	U	21	24	U	24	25	U	25
4-Nitroaniline	80	U	80	73	U	73	84	U	84	86	U	86
4-Nitrophenol	110	U	110	97	U	97	110	U	110	120	U	120
Acenaphthene	11	U	11	10	U	10	12	U	12	12	U	12
Acenaphthylene	19	U	19	17	U	17	20	U	20	20	U	20
Anthracene	19	U	19	17	U	17	20	U	20	20	U	20
Benzo(a)anthracene	22	U	22	20	U	20	23	U	23	24	U	24
Benzo(a)pyrene	22	U	22	20	U	20	23	U	23	24	U	24
Benzo(b)fluoranthene	29	U	29	26	U	26	30	U	30	31	U	31
Benzo(ghi)perylene	18	U	18	16	U	16	18	U	18	19	U	19
Benzo(k)fluoranthene	44	U	44	40	U	40	46	U	46	47	U	47
Bis(2-chloro-1-methylethyl)ether	25	U	25	23	U	23	27	U	27	27	U	27
Bis(2-Chloroethoxy)methane	25	U	25	23	U	23	27	U	27	27	U	27
Bis(2-chloroethyl) ether	18	U	18	17	U	17	19	U	19	20	U	20
Bis(2-ethylhexyl) phthalate	100	JB	51	88	JB	46	53	U	53	150	JB	55
Butylbenzylphthalate	48	U	48	43	U	43	50	U	50	51	U	51
Carbazole	40	U	40	36	U	36	41	U	41	43	U	43
Chrysene	30	U	30	27	U	27	31	U	31	32	U	32
Di-n-butylphthalate	32	U	32	29	U	29	33	U	33	34	U	34
Di-n-octylphthalate	16	U	16	14	U	14	17	U	17	17	U	17
Dibenz[a,h]anthracene	21	U	21	19	U	19	22	U	22	23	U	23
Dibenzofuran	22	U	22	20	U	20	23	U	23	24	U	24
Diethyl phthalate	29	U	29	26	U	26	30	U	30	31	U	31
Dimethyl phthalate	78	J	25	62	J	23	150	J	27	27	U	27
Fluoranthene	40	U	40	36	U	36	41	U	41	43	U	43

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYM2			J1CYM3			J1CYM4			J1CYM5		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	20	U	20	18	U	18	21	U	21	21	U	21
Hexachlorobenzene	32	U	32	29	U	29	33	U	33	34	U	34
Hexachlorobutadiene	11	U	11	10	U	10	12	U	12	12	U	12
Hexachlorocyclopentadiene	55	U	55	50	U	50	58	U	58	59	U	59
Hexachloroethane	24	U	24	21	U	21	25	U	25	25	U	25
Indeno(1,2,3-cd)pyrene	24	U	24	22	U	22	25	U	25	26	U	26
Isophorone	19	U	19	17	U	17	20	U	20	20	U	20
N-Nitroso-di-n-dipropylamine	34	U	34	31	U	31	36	U	36	37	U	37
N-Nitrosodiphenylamine	23	U	23	21	U	21	24	U	24	25	U	25
Naphthalene	34	U	34	31	U	31	36	U	36	37	U	37
Nitrobenzene	24	U	24	22	U	22	25	U	25	26	U	26
Pentachlorophenol	370	U	370	330	U	330	380	U	380	390	U	390
Phenanthrene	19	U	19	17	U	17	20	U	20	20	U	20
Phenol	20	U	20	18	U	18	21	J	21	48	J	21
Pyrene	13	U	13	12	U	12	14	U	14	14	U	14

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYM6 10/30/2011			J1CYM7 10/30/2011			J1CYM8 10/30/2011			J1CYM9 10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PAHs												
Acenaphthene	9.7	U	9.7	12	U	12	11	U	11	9.7	U	9.7
Acenaphthylene	8.8	U	8.8	11	U	11	9.8	U	9.8	8.8	U	8.8
Anthracene	3	U	3	3.6	U	3.6	3.3	U	3.3	3	U	3
Benzo(a)anthracene	3.1	U	3.1	3.7	U	3.7	3.5	U	3.5	3.1	U	3.1
Benzo(a)pyrene	6.2	U	6.2	7.5	U	7.5	7	U	7	6.2	U	6.2
Benzo(b)fluoranthene	4.1	U	4.1	4.9	U	4.9	5.1	JX	4.6	4.1	U	4.1
Benzo(ghi)perylene	7	U	7	8.4	U	8.4	7.8	U	7.8	7	U	7
Benzo(k)fluoranthene	3.8	U	3.8	4.6	U	4.6	4.3	U	4.3	3.8	U	3.8
Chrysene	4.7	U	4.7	5.7	U	5.7	5.3	U	5.3	4.7	U	4.7
Dibenz[a,h]anthracene	11	U	11	13	U	13	12	U	12	11	U	11
Fluoranthene	13	U	13	15	U	15	14	U	14	13	U	13
Fluorene	5.1	U	5.1	6.2	U	6.2	5.8	U	5.8	5.1	U	5.1
Indeno(1,2,3-cd)pyrene	12	U	12	14	U	14	13	U	13	12	U	12
Naphthalene	12	U	12	14	U	14	13	U	13	12	U	12
Phenanthrene	12	U	12	14	U	14	13	U	13	12	U	12
Pyrene	12	U	12	14	U	14	13	U	13	12	U	12
PCBs												
Aroclor-1016	2.8	U	2.8	3.3	U	3.3	3.1	U	3.1	2.9	U	2.9
Aroclor-1221	8.2	U	8.2	9.5	U	9.5	8.9	U	8.9	8.3	U	8.3
Aroclor-1232	2	U	2	2.4	U	2.4	2.2	U	2.2	2.1	U	2.1
Aroclor-1242	4.8	U	4.8	5.5	U	5.5	5.2	U	5.2	4.8	U	4.8
Aroclor-1248	4.8	U	4.8	5.5	U	5.5	5.2	U	5.2	4.8	U	4.8
Aroclor-1254	2.7	U	2.7	14	P	3.1	4.2	J	2.9	2.7	U	2.7
Aroclor-1260	2.7	U	2.7	17		3.1	2.9	U	2.9	2.7	U	2.7
Pesticides												
Aldrin	0.26	U	0.26	0.29	U	0.29	0.29	U	0.29	0.26	U	0.26
Alpha-BHC	0.22	U	0.22	0.25	U	0.25	0.24	U	0.24	0.22	U	0.22
alpha-Chlordane	0.33	U	0.33	0.37	U	0.37	0.37	U	0.37	0.34	U	0.34
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.68	U	0.68	0.76	U	0.76	0.76	U	0.76	0.69	U	0.69
Delta-BHC	0.41	U	0.41	0.46	U	0.46	0.46	U	0.46	0.42	U	0.42
Dichlorodiphenyldichloroethane	0.56	U	0.56	0.63	U	0.63	0.62	U	0.62	0.57	U	0.57
Dichlorodiphenyldichloroethylene	0.24	U	0.24	0.4	J	0.27	0.44	JX	0.27	0.25	U	0.25
Dichlorodiphenyltrichloroethane	0.61	U	0.61	6.8	U	6.8	6.7	U	6.7	0.61	U	0.61
Dieldrin	0.22	U	0.22	0.24	U	0.24	0.24	U	0.24	0.22	U	0.22
Endosulfan I	0.18	U	0.18	0.2	U	0.2	0.2	U	0.2	0.18	U	0.18
Endosulfan II	0.29	U	0.29	0.33	U	0.33	0.33	U	0.33	0.3	U	0.3
Endosulfan sulfate	0.28	U	0.28	0.32	U	0.32	0.31	U	0.31	0.29	U	0.29
Endrin	0.31	U	0.31	0.35	U	0.35	0.35	U	0.35	0.32	U	0.32
Endrin aldehyde	0.18	U	0.18	0.2	U	0.2	0.19	U	0.19	0.18	U	0.18
Endrin ketone	0.5	U	0.5	0.56	U	0.56	0.56	U	0.56	0.51	U	0.51
Gamma-BHC (Lindane)	0.48	U	0.48	0.53	U	0.53	0.53	U	0.53	0.48	U	0.48
gamma-Chlordane	0.27	U	0.27	0.31	U	0.31	0.3	U	0.3	0.28	U	0.28
Heptachlor	0.22	U	0.22	0.25	U	0.25	0.24	U	0.24	0.22	U	0.22
Heptachlor epoxide	0.44	U	0.44	0.49	U	0.49	0.49	U	0.49	0.44	U	0.44
Methoxychlor	0.46	U	0.46	5.2	U	5.2	5.1	U	5.1	0.47	U	0.47
Toxaphene	16	U	16	18	U	18	18	U	18	16	U	16

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYM6			J1CYM7			J1CYM8			J1CYM9		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	29	U	29	31	U	31	31	U	31	29	U	29
1,2-Dichlorobenzene	23	U	23	24	U	24	25	U	25	23	U	23
1,3-Dichlorobenzene	12	U	12	13	U	13	13	U	13	13	U	13
1,4-Dichlorobenzene	14	U	14	15	U	15	15	U	15	14	U	14
2,4,5-Trichlorophenol	10	U	10	11	U	11	11	U	11	10	U	10
2,4,6-Trichlorophenol	10	U	10	11	U	11	11	U	11	10	U	10
2,4-Dichlorophenol	10	U	10	11	U	11	11	U	11	10	U	10
2,4-Dimethylphenol	68	U	68	73	U	73	74	U	74	69	U	69
2,4-Dinitrophenol	340	U	340	370	U	370	370	U	370	350	U	350
2,4-Dinitrotoluene	68	U	68	73	U	73	74	U	74	69	U	69
2,6-Dinitrotoluene	29	U	29	31	U	31	31	U	31	29	U	29
2-Chloronaphthalene	10	U	10	11	U	11	11	U	11	10	U	10
2-Chlorophenol	21	U	21	23	U	23	23	U	23	22	U	22
2-Methylnaphthalene	19	U	19	21	U	21	21	U	21	20	U	20
2-Methylphenol (cresol, o-)	13	U	13	14	U	14	14	U	14	14	U	14
2-Nitroaniline	51	U	51	56	U	56	56	U	56	52	U	52
2-Nitrophenol	10	U	10	11	U	11	11	U	11	10	U	10
3+4 Methylphenol (cresol, m+p)	34	U	34	37	U	37	37	U	37	34	U	34
3,3'-Dichlorobenzidine	92	U	92	100	U	100	100	U	100	94	U	94
3-Nitroaniline	75	U	75	81	U	81	81	U	81	76	U	76
4,6-Dinitro-2-methylphenol	340	U	340	370	U	370	370	U	370	340	U	340
4-Bromophenylphenyl ether	19	U	19	21	U	21	21	U	21	20	U	20
4-Chloro-3-methylphenol	68	U	68	73	U	73	74	U	74	69	U	69
4-Chloroaniline	84	U	84	91	U	91	91	U	91	85	U	85
4-Chlorophenylphenyl ether	21	U	21	23	U	23	23	U	23	22	U	22
4-Nitroaniline	74	U	74	81	U	81	81	U	81	76	U	76
4-Nitrophenol	99	U	99	110	U	110	110	U	110	100	U	100
Acenaphthene	11	U	11	11	U	11	11	U	11	11	U	11
Acenaphthylene	17	U	17	19	U	19	19	U	19	18	U	18
Anthracene	17	U	17	19	U	19	19	U	19	18	U	18
Benzo(a)anthracene	20	U	20	22	U	22	22	U	22	21	U	21
Benzo(a)pyrene	20	U	20	22	U	22	22	U	22	21	U	21
Benzo(b)fluoranthene	27	U	27	29	U	29	29	U	29	27	U	27
Benzo(ghi)perylene	16	U	16	18	U	18	18	U	18	17	U	17
Benzo(k)fluoranthene	41	U	41	44	U	44	45	U	45	42	U	42
Bis(2-chloro-1-methylethyl)ether	24	U	24	26	U	26	26	U	26	24	U	24
Bis(2-Chloroethoxy)methane	24	U	24	26	U	26	26	U	26	24	U	24
Bis(2-chloroethyl) ether	17	U	17	18	U	18	18	U	18	17	U	17
Bis(2-ethylhexyl) phthalate	89	JB	47	97	JB	51	100	JB	51	89	JB	48
Butylbenzylphthalate	44	U	44	48	U	48	48	U	48	45	U	45
Carbazole	37	U	37	40	U	40	40	U	40	38	U	38
Chrysene	28	U	28	30	U	30	30	U	30	28	U	28
Di-n-butylphthalate	30	U	30	32	U	32	32	U	32	30	U	30
Di-n-octylphthalate	15	U	15	16	U	16	16	U	16	15	U	15
Dibenz[a,h]anthracene	19	U	19	21	U	21	21	U	21	20	U	20
Dibenzofuran	20	U	20	22	U	22	22	U	22	21	U	21
Diethyl phthalate	27	U	27	29	U	29	29	U	29	27	U	27
Dimethyl phthalate	24	U	24	26	U	26	26	U	26	81	J	24
Fluoranthene	37	U	37	40	U	40	40	U	40	38	U	38

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYM6			J1CYM7			J1CYM8			J1CYM9		
	10/30/2011			10/30/2011			10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	18	U	18	20	U	20	20	U	20	19	U	19
Hexachlorobenzene	30	U	30	32	U	32	32	U	32	30	U	30
Hexachlorobutadiene	10	U	10	11	U	11	11	U	11	10	U	10
Hexachlorocyclopentadiene	51	U	51	56	U	56	56	U	56	52	U	52
Hexachloroethane	22	U	22	24	U	24	24	U	24	22	U	22
Indeno(1,2,3-cd)pyrene	23	U	23	24	U	24	25	U	25	23	U	23
Isophorone	17	U	17	19	U	19	19	U	19	18	U	18
N-Nitroso-di-n-dipropylamine	32	U	32	34	U	34	35	U	35	32	U	32
N-Nitrosodiphenylamine	21	U	21	23	U	23	23	U	23	22	U	22
Naphthalene	32	U	32	34	U	34	35	U	35	32	U	32
Nitrobenzene	23	U	23	24	U	24	25	U	25	23	U	23
Pentachlorophenol	340	U	340	370	U	370	370	U	370	340	U	340
Phenanthrene	17	U	17	19	U	19	19	U	19	18	U	18
Phenol	18	U	18	39	J	20	20	U	20	19	U	19
Pyrene	12	U	12	13	U	13	13	U	13	13	U	13

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYN0 10/30/2011		
	µg/kg	Q	PQL
PAHs			
Acenaphthene	12	U	12
Acenaphthylene	11	U	11
Anthracene	3.6	U	3.6
Benzo(a)anthracene	3.8	U	3.8
Benzo(a)pyrene	24	X	7.6
Benzo(b)fluoranthene	17	JX	5
Benzo(ghi)perylene	8.5	U	8.5
Benzo(k)fluoranthene	4.7	U	4.7
Chrysene	5.7	U	5.7
Dibenz[a,h]anthracene	13	U	13
Fluoranthene	15	U	15
Fluorene	6.3	U	6.3
Indeno(1,2,3-cd)pyrene	14	U	14
Naphthalene	14	U	14
Phenanthrene	14	U	14
Pyrene	14	U	14
PCBs			
Aroclor-1016	3.2	U	3.2
Aroclor-1221	9.3	U	9.3
Aroclor-1232	2.3	U	2.3
Aroclor-1242	5.4	U	5.4
Aroclor-1248	5.4	U	5.4
Aroclor-1254	3	U	3
Aroclor-1260	3	U	3
Pesticides			
Aldrin	0.29	U	0.29
Alpha-BHC	0.25	U	0.25
alpha-Chlordane	0.37	U	0.37
beta-1,2,3,4,5,6-Hexachlorocyclohexane	0.77	U	0.77
Delta-BHC	0.46	U	0.46
Dichlorodiphenyldichloroethane	0.63	U	0.63
Dichlorodiphenyldichloroethylene	0.51	J	0.27
Dichlorodiphenyltrichloroethane	6.8	UD	6.8
Dieldrin	0.24	U	0.24
Endosulfan I	0.2	U	0.2
Endosulfan II	0.33	U	0.33
Endosulfan sulfate	0.32	U	0.32
Endrin	0.35	U	0.35
Endrin aldehyde	0.2	U	0.2
Endrin ketone	0.56	U	0.56
Gamma-BHC (Lindane)	0.54	U	0.54
gamma-Chlordane	0.31	U	0.31
Heptachlor	0.25	U	0.25
Heptachlor epoxide	0.49	U	0.49
Methoxychlor	5.2	UD	5.2
Toxaphene	18	U	18

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYN0			J1CYN2		
	10/30/2011			10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs						
1,2,4-Trichlorobenzene	33	U	33	28	U	28
1,2-Dichlorobenzene	26	U	26	22	U	22
1,3-Dichlorobenzene	14	U	14	12	U	12
1,4-Dichlorobenzene	16	U	16	13	U	13
2,4,5-Trichlorophenol	12	U	12	9.8	U	9.8
2,4,6-Trichlorophenol	12	U	12	9.8	U	9.8
2,4-Dichlorophenol	12	U	12	9.8	U	9.8
2,4-Dimethylphenol	79	U	79	65	U	65
2,4-Dinitrophenol	400	U	400	330	U	330
2,4-Dinitrotoluene	79	U	79	65	U	65
2,6-Dinitrotoluene	33	U	33	28	U	28
2-Chloronaphthalene	12	U	12	9.8	U	9.8
2-Chlorophenol	25	U	25	21	U	21
2-Methylnaphthalene	23	U	23	19	U	19
2-Methylphenol (cresol, o-)	15	U	15	13	U	13
2-Nitroaniline	60	U	60	49	U	49
2-Nitrophenol	12	U	12	9.8	U	9.8
3+4 Methylphenol (cresol, m+p)	39	U	39	32	U	32
3,3'-Dichlorobenzidine	110	U	110	89	U	89
3-Nitroaniline	87	U	87	72	U	72
4,6-Dinitro-2-methylphenol	390	U	390	320	U	320
4-Bromophenylphenyl ether	23	U	23	19	U	19
4-Chloro-3-methylphenol	79	U	79	65	U	65
4-Chloroaniline	98	U	98	81	U	81
4-Chlorophenylphenyl ether	25	U	25	21	U	21
4-Nitroaniline	86	U	86	71	U	71
4-Nitrophenol	120	U	120	95	U	95
Acenaphthene	12	U	12	10	U	10
Acenaphthylene	20	U	20	17	U	17
Anthracene	20	U	20	17	U	17
Benzo(a)anthracene	24	U	24	20	U	20
Benzo(a)pyrene	120	J	24	20	U	20
Benzo(b)fluoranthene	31	U	31	26	U	26
Benzo(ghi)perylene	19	U	19	16	U	16
Benzo(k)fluoranthene	48	U	48	39	U	39
Bis(2-chloro-1-methylethyl)ether	27	U	27	23	U	23
Bis(2-Chloroethoxy)methane	27	U	27	23	U	23
Bis(2-chloroethyl) ether	20	U	20	16	U	16
Bis(2-ethylhexyl) phthalate	100	JB	55	91	JB	45
Butylbenzylphthalate	51	U	51	42	U	42
Carbazole	43	U	43	35	U	35
Chrysene	32	U	32	27	U	27
Di-n-butylphthalate	35	U	35	29	U	29
Di-n-octylphthalate	17	U	17	14	U	14
Dibenz[a,h]anthracene	23	U	23	19	U	19
Dibenzofuran	24	U	24	20	U	20
Diethyl phthalate	31	U	31	26	U	26
Dimethyl phthalate	27	U	27	23	U	23
Fluoranthene	43	U	43	35	U	35

Table C-3. 100-D-8 In-process Sample Results - Organics. (12 Pages)

Constituent	J1CYN0 10/30/2011			J1CYN2 10/30/2011		
	µg/kg	Q	PQL	µg/kg	Q	PQL
Fluorene	21	U	21	18	U	18
Hexachlorobenzene	35	U	35	29	U	29
Hexachlorobutadiene	12	U	12	9.8	U	9.8
Hexachlorocyclopentadiene	60	U	60	49	U	49
Hexachloroethane	25	U	25	21	U	21
Indeno(1,2,3-cd)pyrene	26	U	26	22	U	22
Isophorone	20	U	20	17	U	17
N-Nitroso-di-n-dipropylamine	37	U	37	31	U	31
N-Nitrosodiphenylamine	25	U	25	21	U	21
Naphthalene	37	U	37	31	U	31
Nitrobenzene	26	U	26	22	U	22
Pentachlorophenol	390	U	390	320	U	320
Phenanthrene	20	U	20	17	U	17
Phenol	34	J	21	18	U	18
Pyrene	19	J	14	12	U	12

APPENDIX D

GLOBAL POSITIONING ENVIRONMENTAL RADIOLOGICAL SURVEYOR (GPERS) SURVEYS

Figure D-1. Radiological Survey of Excavation Footprint.

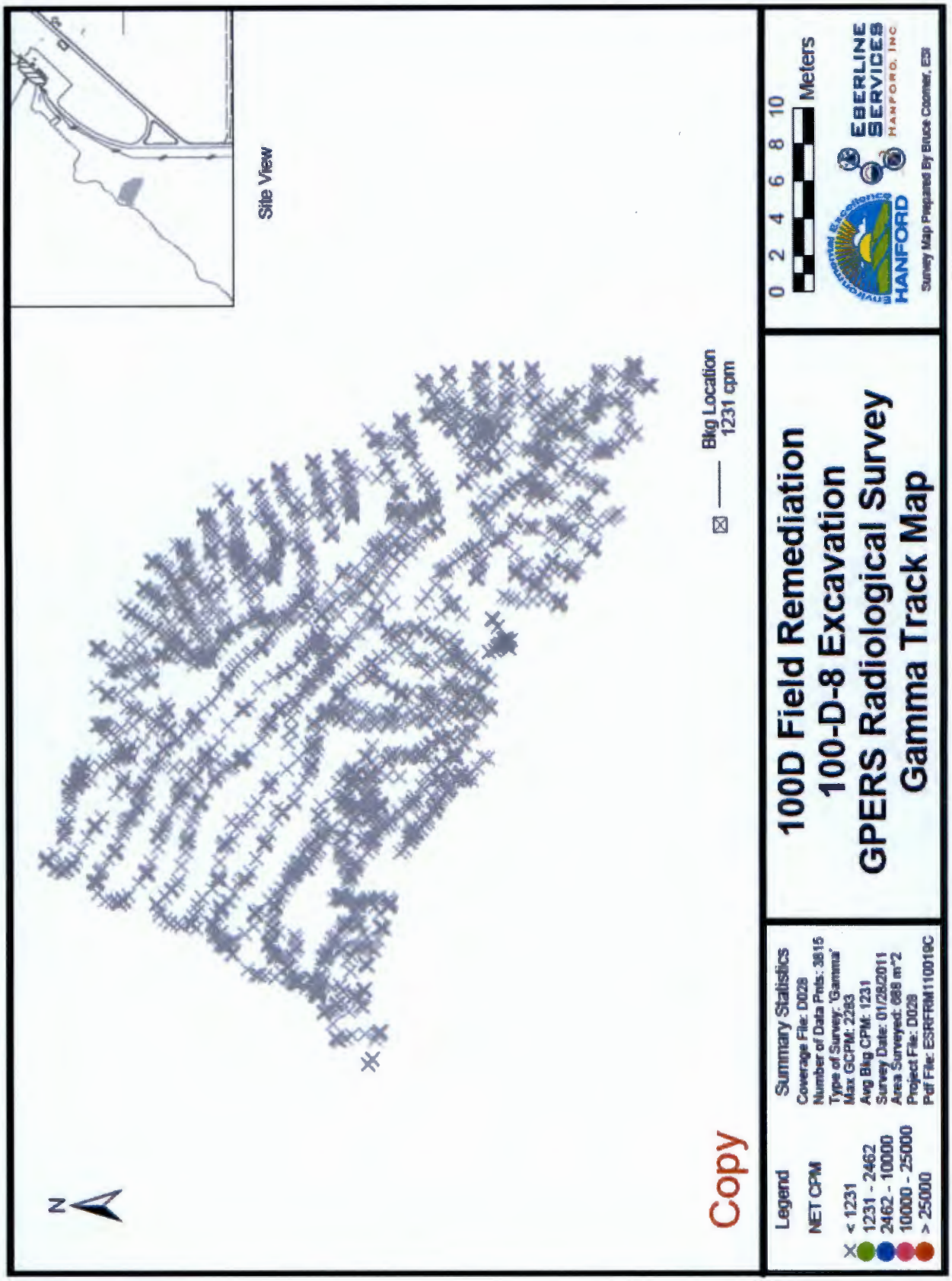


Figure D-2. Radiological Survey of West Stockpile.

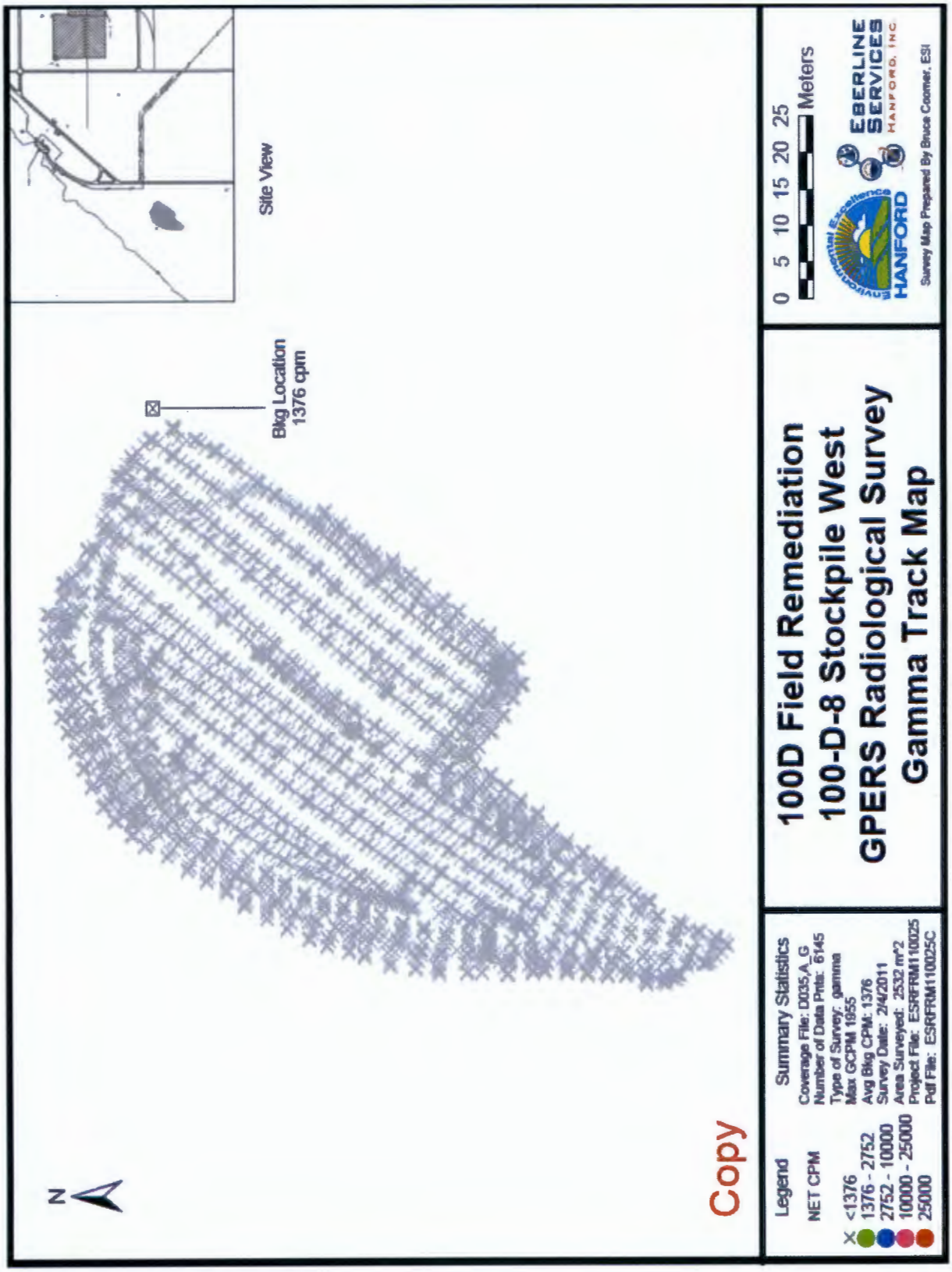
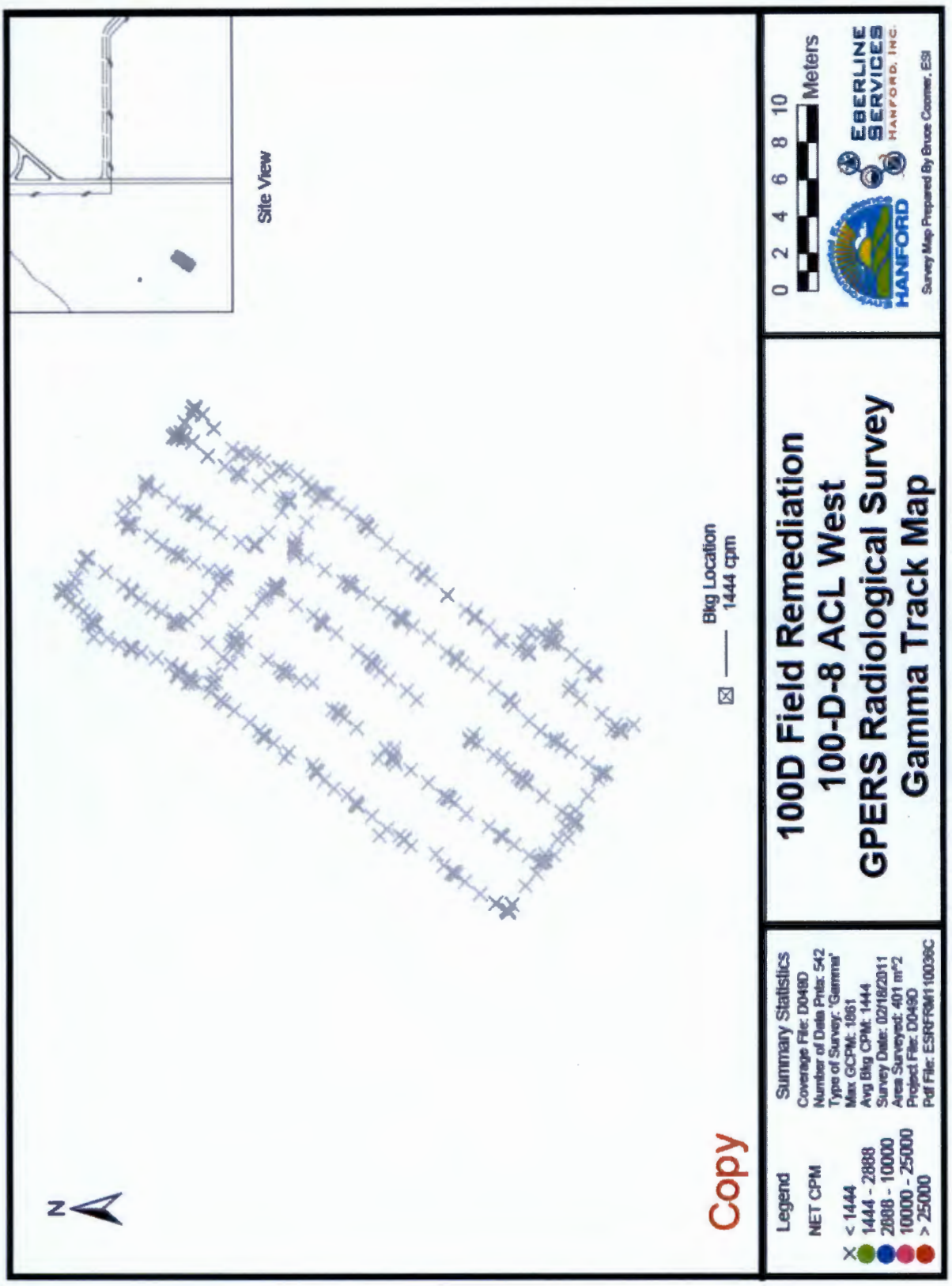


Figure D-3. Radiological Survey of West Waste Staging Area Footprint.



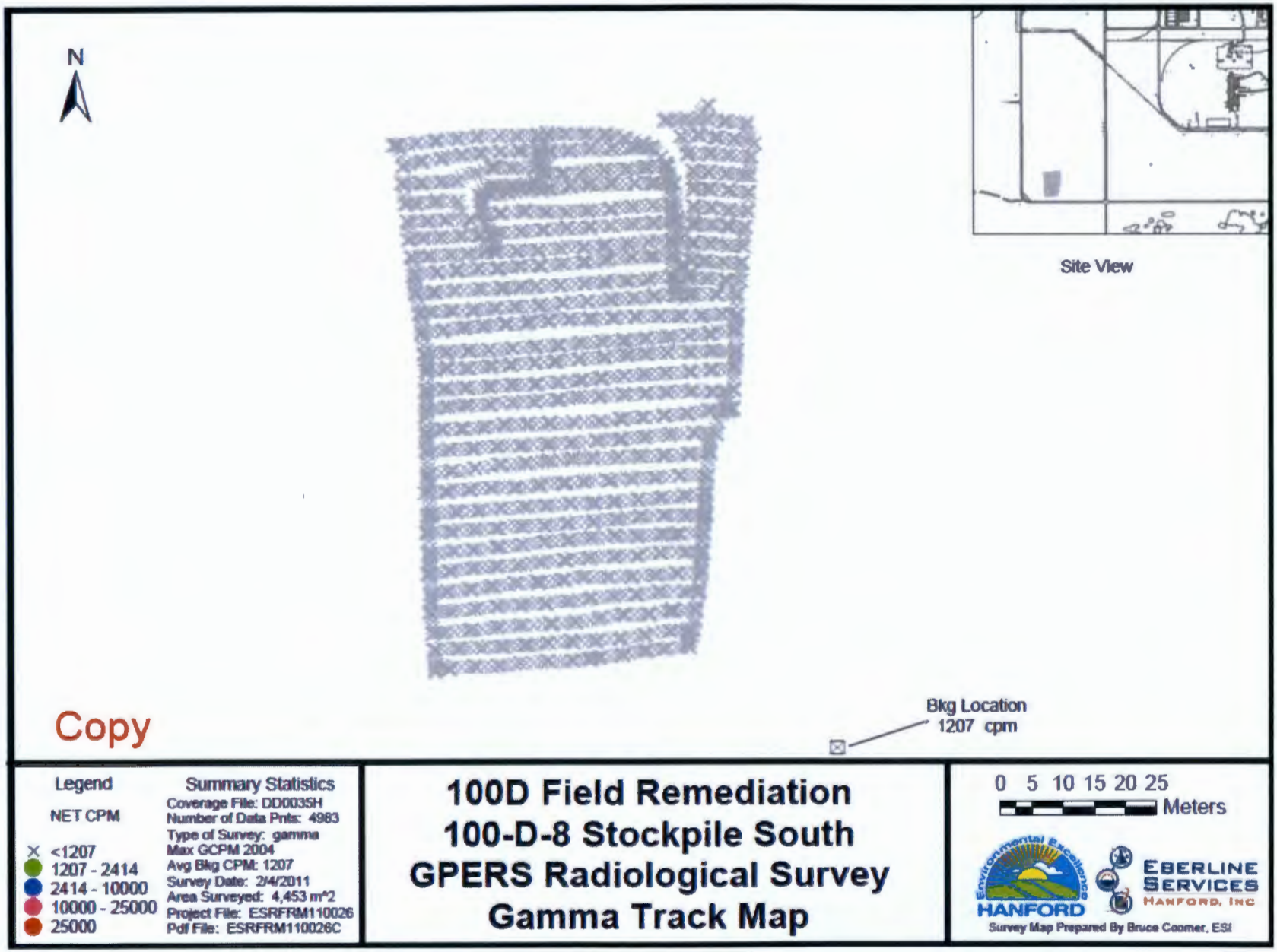


Figure D-4. Radiological Survey of South Stockpile.

Figure D-5. Radiological Survey of South Stockpile.

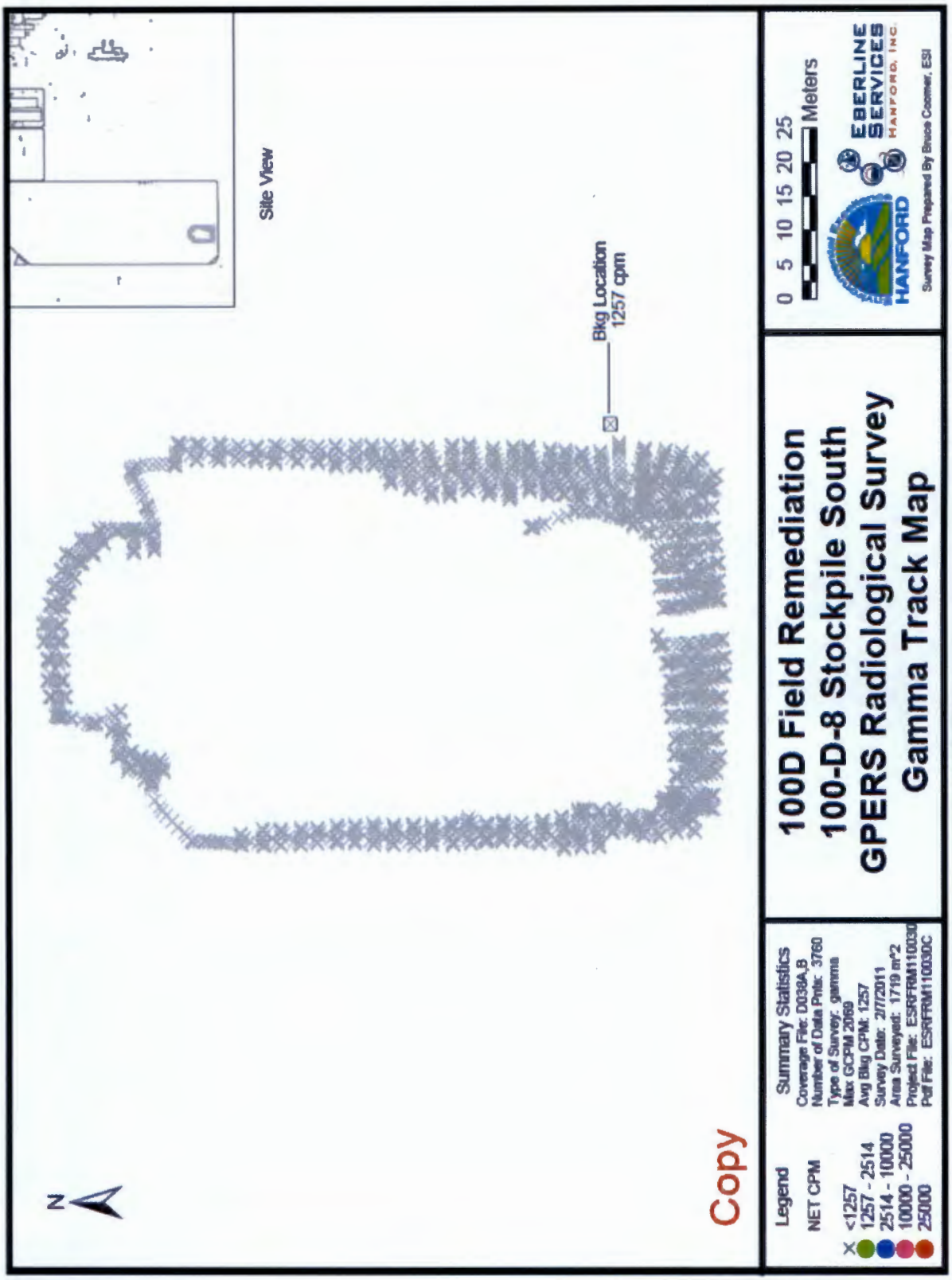


Figure D-6. Radiological Survey of South Waste Staging Area Footprint.

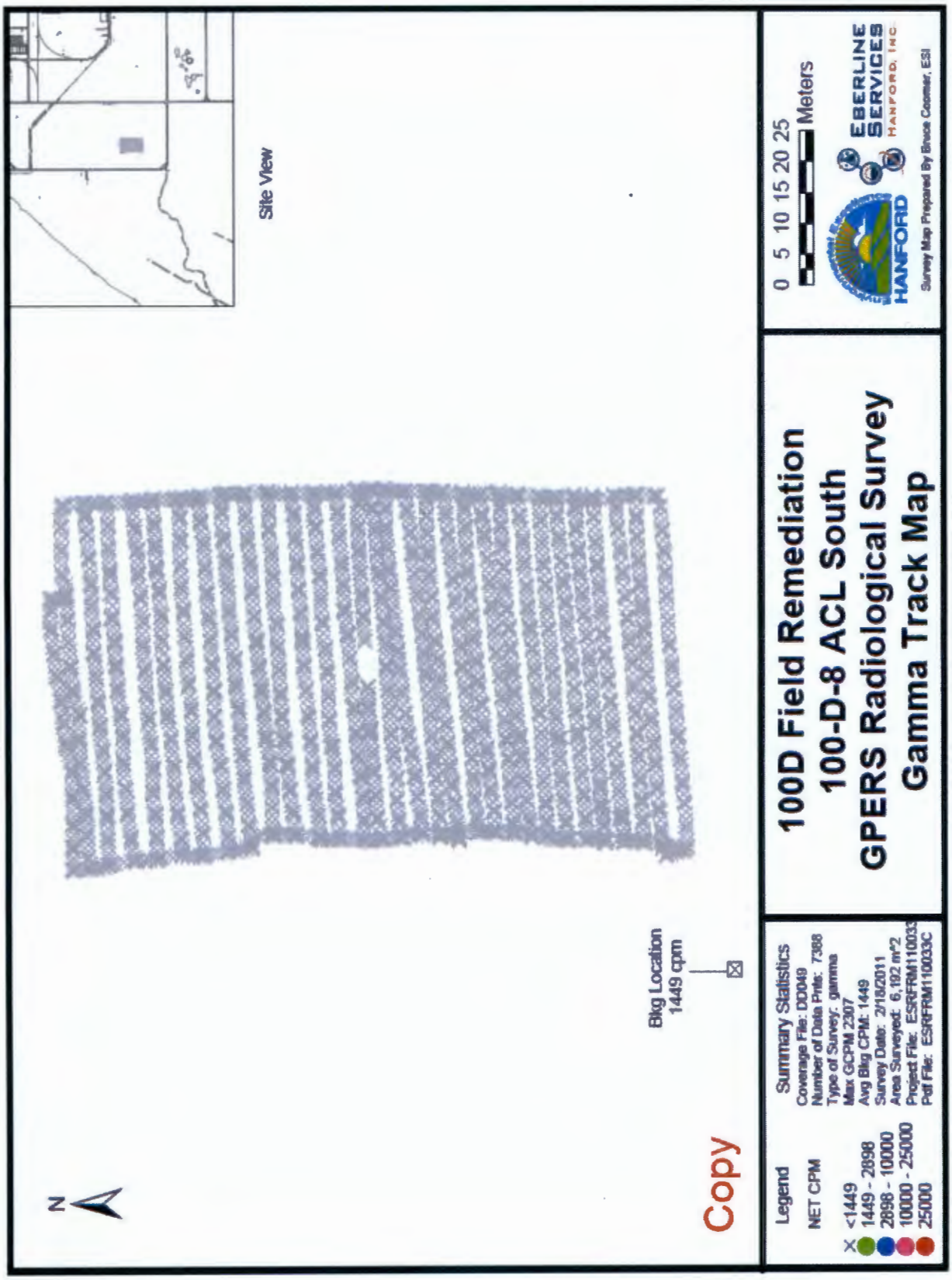
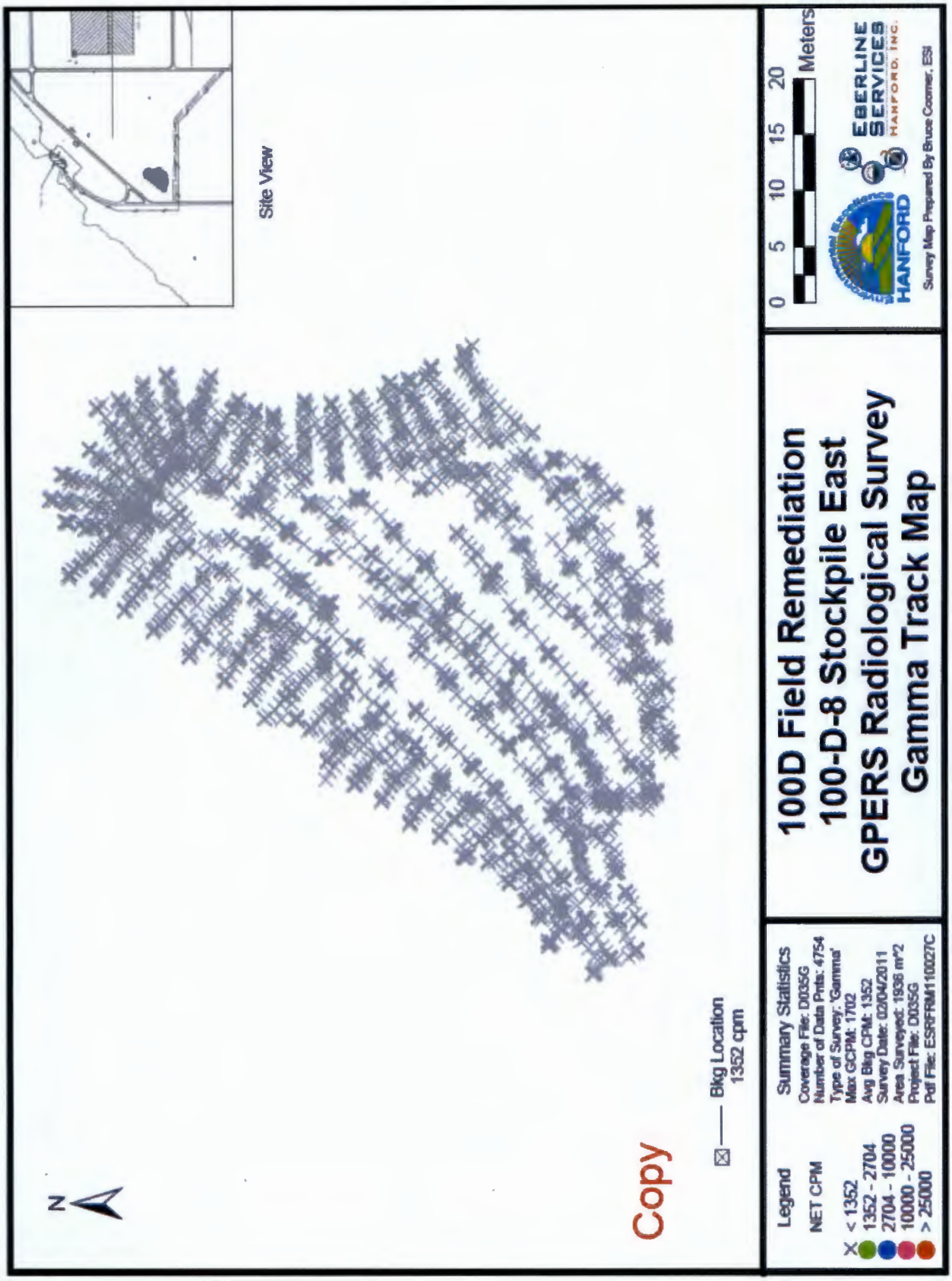


Figure D-7. Radiological Survey of East Stockpile.



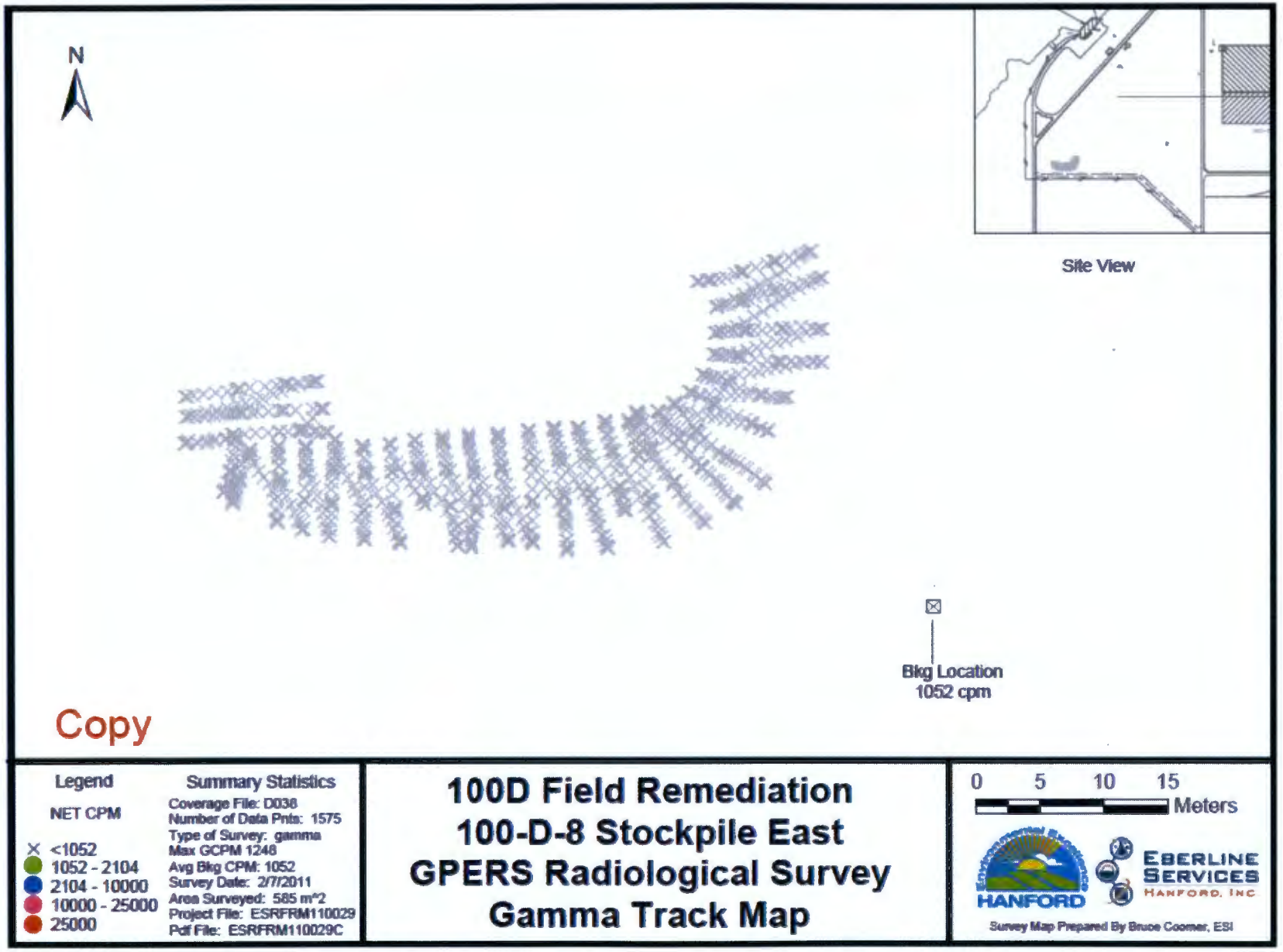


Figure D-8. Radiological Survey of East Stockpile.

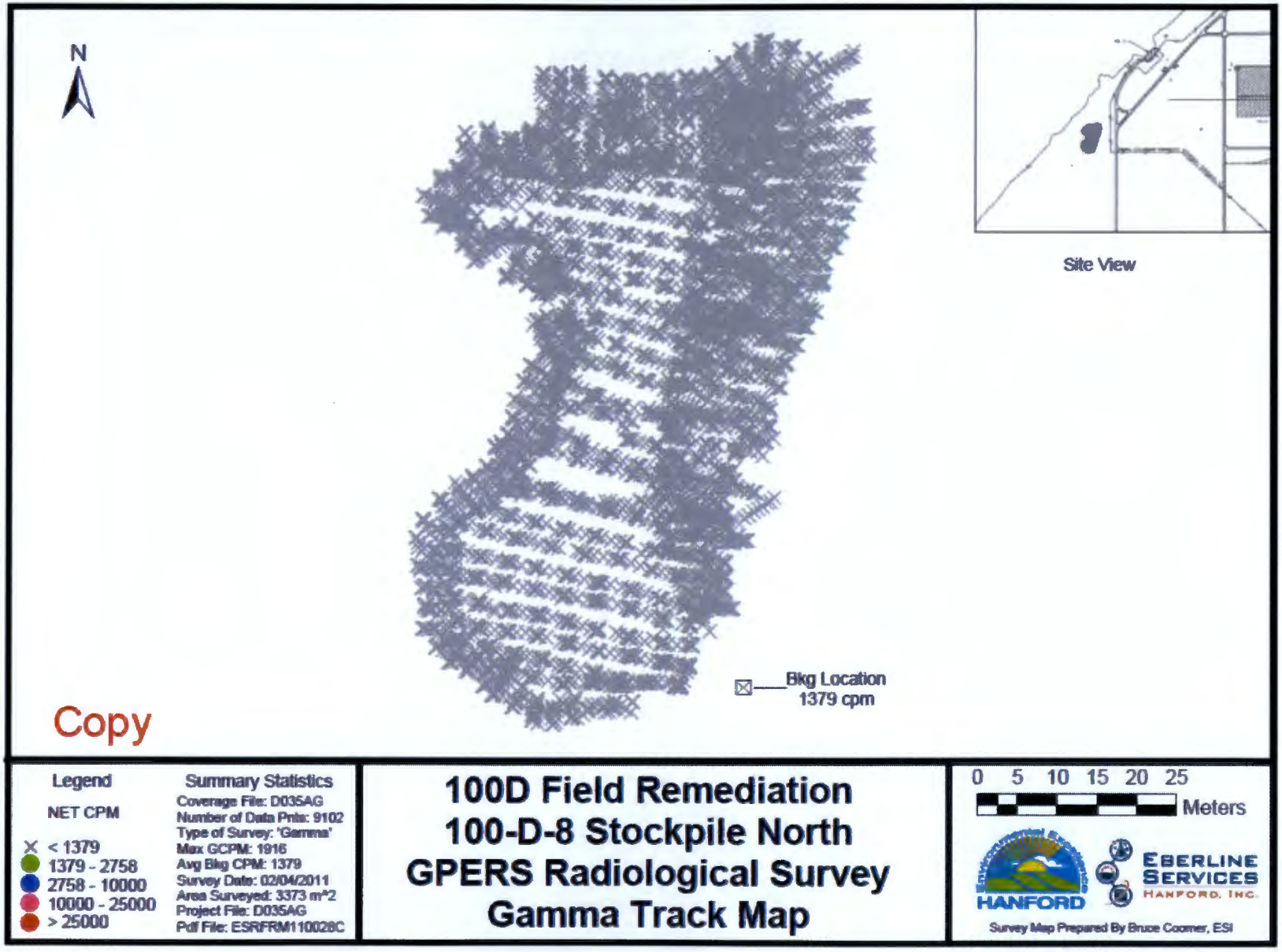
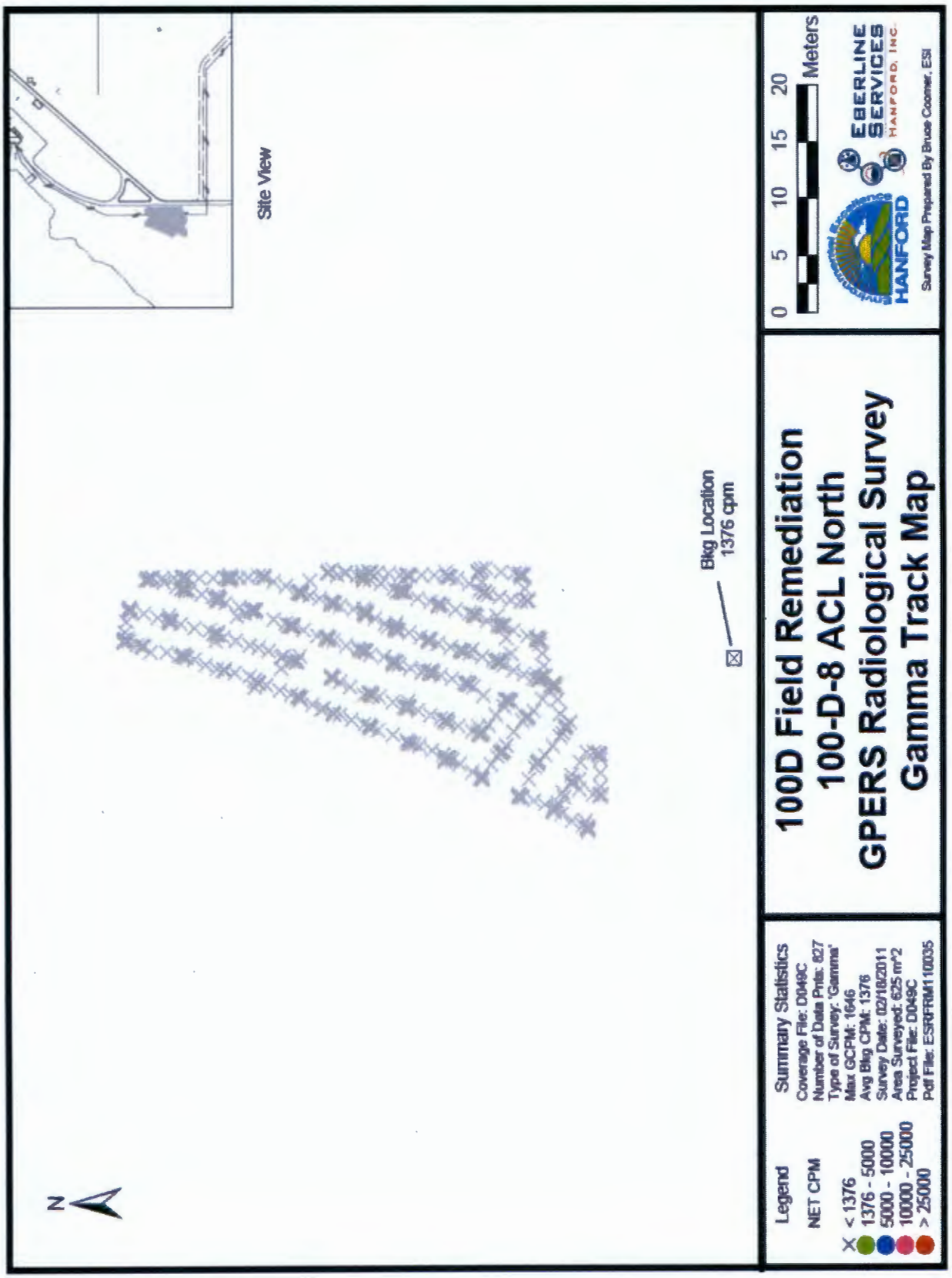


Figure D-9. Radiological Survey of North Stockpile.

Figure D-10. Radiological Survey of North Waste Staging Pile Area Footprint.



APPENDIX E

CALCULATION BRIEFS

APPENDIX E

CALCULATION BRIEFS

The calculations in this appendix are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the file will be stored in a U.S. Department of Energy, Richland Operations Office, repository. These calculations have been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculation," Washington Closure Hanford, Richland, Washington. The following calculations are provided in this appendix.

100-D-8 Waste Site Cleanup Verification 95% UCL Calculation, 0100D-CA-V0451, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-D-8 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculation, 0100D-CA-V0452, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-D-8 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater, 0100D-CA-V0454, Rev. 0, Washington Closure Hanford, Richland, Washington.

DISCLAIMER FOR CALCULATIONS

The calculations 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.

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CALCULATION COVER SHEET

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

Area: 100-D

Discipline: Environmental *Calculation No: 0100D-CA-V0451

Subject: 100-D-8 Waste Site Cleanup Verification 95% UCL Calculation

Computer Program: Excel Program No: Excel 2003

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

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 27 Attm. 1 = 33 Total = 61	N. K. Schiffern	I. B. Berezovskiy	J. D. Skoglie	D. F. Obenauer	8/6/12

SUMMARY OF REVISION

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

Washington Closure Hanford **CALCULATION SHEET**

Originator N. K. Schiffern Date 06/21/12 Calc. No. 0100D-CA-V0451 Rev. No. 0
Project 100-D Field Remediation Job No. 14655 Checked I. B. Berezovskiy Date 06/21/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 1 of 27

Summary

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

Table of Contents:

Given/References:
1) Sample Results (Attachment 1).
2) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
3) DOE-RL, 2009b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
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) 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.
8) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Administrative Code.*

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

Calculation Description:
The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 100-D-8 waste site. The data were entered into an EXCEL 2003 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with the RDR/RAWP (DOE-RL 2009b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:
The 100-D-8 waste site underwent statistical sampling. The 100-D-8 waste site has three decision units for verification sampling, consisting of excavation, overburden, and staging pile area.

Washington Closure Hanford **CALCULATION SHEET**

Originator N. K. Schiffern Date 04/03/12 Calc. No. 0100D-CA-V0451 Rev. No. 0
Project 100-D Field Remediation Job No. 14655 Checked I. B. Berezovskiy Date 04/03/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 2 of 27

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 is used instead of the 95% UCL, and no further calculations are performed for those data sets. For convenience, these maximum detected values are included in the summary tables that follow. The 95% UCL was not calculated for data sets with no reported detections. Calculated cleanup levels are not available in Ecology (2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance* for Superfund (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs/COPCs and are also not included in these calculations. The 95% UCL values were not calculated for potassium-40, radium-226, radium-228, thorium-228, and thorium-232 based on natural occurence at the Hanford Site.

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

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

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

The RPD is calculated when both the primary value and the duplicate 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 II-1 of the SAP (DOE-RL 2009a). 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) split and 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 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 results exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

Washington Closure Hanford **CALCULATION SHEET**

Originator N. K. Schiffern NS Date 06/21/12 Calc. No. 0100D-CA-V0451 Rev. No. 0
Project 100-D Field Remediation Job No. 14655 Checked I. B. Berezovskiy Date 06/21/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 3 of 27

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

Results Summary - Excavation [a]

Analyte	95% UCL Result	Maximum Result	Units
Technetium-99	0.472	-	pCi/g
Thorium-230	0.195	-	pCi/g
Tritium	0.0149	-	pCi/g
Uranium-234	0.375	-	pCi/g
Uranium-238	0.356	-	pCi/g
Antimony	1.3	-	mg/kg
Arsenic	2.7	-	mg/kg
Barium	62.9	-	mg/kg
Beryllium	-	0.034	mg/kg
Cadmium	-	0.063	mg/kg
Chromium	9.0	-	mg/kg
Cobalt	7.6	-	mg/kg
Copper	14.5	-	mg/kg
Lead	4.4	-	mg/kg
Mercury	-	0.015	mg/kg
Manganese	289	-	mg/kg
Nickel	11.8	-	mg/kg
Vanadium	55.2	-	mg/kg
Zinc	37.4	-	mg/kg
Chloride	3.4	-	mg/kg
Nitrogen in Nitrate	2.9	-	mg/kg
Nitrogen in Nitrite and Nitrate	4.4	-	mg/kg
Sulfate	37.4	-	mg/kg
3-Part Test Evaluation			
95% UCL or Maximum > Cleanup Limit	NA	NA	
> 10% above Cleanup Limit?	NA	NA	
Any sample > 2x Cleanup Limit?	NA	NA	

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

Results Summary - Overburden [a]

Analyte	95% UCL Result	Maximum Result	Units
Cesium-137	0.0324	-	pCi/g
Nickel-63	7.44	-	pCi/g
Thorium-230	0.217	-	pCi/g
Uranium-234	0.208	-	pCi/g
Uranium-238	0.212	-	pCi/g
Antimony	1.8	-	mg/kg
Arsenic	2.1	-	mg/kg
Barium	62.8	-	mg/kg
Boron	-	2.3	mg/kg
Cadmium	-	0.069	mg/kg
Chromium	5.9	-	mg/kg
Cobalt	11.2	-	mg/kg
Copper	15.7	-	mg/kg
Lead	4.2	-	mg/kg
Manganese	334	-	mg/kg
Mercury	-	0.0071	mg/kg
Molybdenum	-	0.26	mg/kg
Nickel	9.3	-	mg/kg
Vanadium	82.7	-	mg/kg
Zinc	44.5	-	mg/kg
Chloride	8.3	-	mg/kg
Nitrogen in Nitrate	5.3	-	mg/kg
Nitrogen in Nitrite and Nitrate	3.1	-	mg/kg
Sulfate	35.3	-	mg/kg
Dimethyl phthalate - SVOA	200	-	ug/kg
Bis(2-ethylhexyl)phthalate	-	92	ug/kg
4-4'-DDE	-	0.32	ug/kg
3-Part Test Evaluation			
95% UCL or Maximum > Cleanup Limit	NO	NO	
> 10% above Cleanup Limit?	NO	NO	
Any sample > 2x Cleanup Limit?	NO	NO	

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

-- = not applicable
B = blank contamination (inorganic constituents)
C = detected in both the sample and the associated quality control blank, and the sample concentration was </=5X the blank concentration.
DE = direct exposure
GW = groundwater
J = estimate
L = dilution indicating physical and chemical interference are present.
M = sample duplicate precision not met
MTCA = *Model Toxics Control Act*
N= recovery exceeds upper or lower control limits.
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
R = detected, but due to a major QA deficiency, the data is unusable.
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
U = undetected
UCL = upper confidence limit
X (metals) = Serial dilution in the analytical batch indicates that physical and chemical interferences are present.
X (SVOAs) = MS, MSD: recovery exceeds upper or lower control limits.
Y = more than 40 % difference between columns, higher result reported.
WAC = Washington Administrative Code

Washington Closure Hanford **CALCULATION SHEET**

Originator N. K. Schiffern Date 04/04/12 Calc. No. 0100D-CA-V0451 Rev. No. 0
Project 100-D Job No. 14655 Checked I. B. Berezovskiy Date 04/04/12
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Summary (continued)

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

Results Summary - Staging Pile Area [a]

Analyte	95% UCL Result	Maximum Result	Units
Tritium	0.0593	-	pCi/g
Uranium-234	0.176	-	pCi/g
Uranium-238	0.163	-	pCi/g
Antimony	-	0.41	mg/kg
Arsenic	3.1	-	mg/kg
Barium	85.0	-	mg/kg
Beryllium	0.51	-	mg/kg
Boron	1.3	-	mg/kg
Cadmium	0.078	-	mg/kg
Chromium	9.1	-	mg/kg
Hexavalent chromium	-	0.213	mg/kg
Cobalt	8.2	-	mg/kg
Copper	16.1	-	mg/kg
Lead	4.9	-	mg/kg
Manganese	325	-	mg/kg
Mercury	-	0.064	mg/kg
Nickel	10.3	-	mg/kg
Vanadium	56.8	-	mg/kg
Zinc	53.1	-	mg/kg
Nitrogen in nitrate	1.5	-	mg/kg
Nitrogen in nitrite and nitrate	2.9	-	mg/kg
Sulfate	4.5	-	mg/kg
Anthracene -PAH	-	6.6	ug/kg
Benzo(a)anthracene -PAH	-	180	ug/kg
Benzo(a)pyrene - PAH	-	100	ug/kg
Benzo(b)fluoranthene - PAH	-	120	ug/kg
Benzo(ghi)perylene - PAH	-	44	ug/kg
Benzo(k)fluoranthene - PAH	-	67	ug/kg
Crysene - PAH	-	150	ug/kg
Dibenz(a,h)anthracene - PAH	-	12	ug/kg
Fluoranthene - PAH	-	300	ug/kg
Indeno(1,2,3-cd)pyrene - PAH	-	62	ug/kg
Phenanthrene PAH	-	96	ug/kg
Pyrene - PAH	-	320	ug/kg
Bis(2-ethylhexyl)phthalate - SVOA	90	-	ug/kg
Dimethyl phthalate - SVOA	160	-	ug/kg
Phenol - SVOA	-	50	ug/kg
Dieldrin	-	0.36	ug/kg
4-4'-DDE	-	0.28	ug/kg
3-Part Test Evaluation			
95% UCL or Maximum > Cleanup Limit?	NO	YES	
> 10% above Cleanup Limit?	NO	YES	
Any sample > 2x Cleanup Limit?	NO	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		
	Excavation	Overburden	Staging Pile
Aluminum	2.8%	5.0%	2.9%
Barium	11.4%	2.4%	20.2%
Calcium	7.4%	5.5%	0.9%
Chromium	10.0%		12.3%
Cobalt		0.9%	
Copper	0.0%	6.1%	5.4%
Iron	13.7%	4.3%	0.0%
Magnesium	3.1%	8.1%	4.1%
Manganese	0.8%	1.5%	8.7%
Silicon	1.4%	7.3%	16.4%
Sodium		7.7%	8.7%
Vanadium	2.8%	3.8%	1.7%
Zinc	0.7%	5.1%	2.1%
Chloride		27.6%	

Grey cells indicate not applicable

[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 N. K. Schiffern
Project 100-D
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
Job No. 14655

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Checked I. B. Berezovskiy

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1 100-D-8 Statistical Calculations
2 Verification Data -Excavation

3 Sample Area	Sample Number	Sample Date	Technetium-99			Thorium-230			Tritium			Uranium-234			Uranium-238		
4			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
5 A-10	J1MXX1	12/12/2011	0.420	U	0.582	0.0971	U	0.110	0.0132	UJ	0.0203	0.144		0.0908	0.0956	U	0.0908
6 Duplicate of J1MXX1	J1MXX4	12/12/2011	0.499	U	0.590	0.229		0.133	0.00922	UJ	0.0172	0.885		0.101	0.698		0.101
7 A-1	J1MXW2	12/12/2011	0.287	U	0.587	0.104	U	0.132	0.0140	UJ	0.0179	0.177		0.139	0.0795	U	0.0993
8 A-2	J1MXW3	12/12/2011	0.407	U	0.590	0.203		0.138	0.0268	UJ	0.0279	0.312		0.110	0.382		0.148
9 A-3	J1MXW4	12/12/2011	0.489	U	0.581	0.0834	U	0.156	0.00855	UJ	0.0179	0.272		0.103	0.134		0.114
10 A-4	J1MXW5	12/12/2011	0.334	U	0.588	0.0551	U	0.256	0.00894	UJ	0.0168	0.308		0.0966	0.205		0.0966
11 A-5	J1MXW6	12/12/2011	0.263	U	0.591	0.242	U	0.227	0.00910	UJ	0.0115	0.234		0.0877	0.372		0.0978
12 A-6	J1MXW7	12/12/2011	0.183	U	0.584	0.167	U	0.158	0.00505	UJ	0.0204	0.227		0.0953	0.328		0.106
13 A-7	J1MXW8	12/12/2011	0.715		0.581	0.260		0.122	0.0119	UJ	0.0147	0.196		0.0926	0.243		0.111
14 A-8	J1MXW9	12/12/2011	0.402	U	0.590	0.139	U	0.132	0.0115	J	0.0107	0.0788	U	0.114	0.155		0.141
15 A-9	J1MXX0	12/12/2011	0.429	U	0.585	0.0971	U	0.110	0.0178	J	0.0145	0.0632	U	0.130	0.358		0.0895
16 A-11	J1MXX2	12/12/2011	0.406	U	0.587	0.132		0.121	0.0117	J	0.00995	0.783		0.113	0.602		0.113
17 A-12	J1MXX3	12/12/2011	0.507	U	0.583	0.277		0.130	0.0104	UJ	0.0157	0.214		0.101	0.184		0.121

18
19 Statistical Computation Input Data

20 Sample Area	Sample Number	Sample Date	Technetium-99 pCi/g			Thorium-230 pCi/g			Tritium pCi/g			Uranium-234 pCi/g			Uranium-238 pCi/g		
22 A-10	J1MXX1/J1MXX4	12/12/2011	0.460			0.163			0.0112			0.515			0.397		
23 A-1	J1MXW2	12/12/2011	0.287			0.104			0.0140			0.177			0.0795		
24 A-2	J1MXW3	12/12/2011	0.407			0.203			0.0268			0.312			0.382		
25 A-3	J1MXW4	12/12/2011	0.489			0.0834			0.00855			0.272			0.134		
26 A-4	J1MXW5	12/12/2011	0.334			0.0551			0.00894			0.308			0.205		
27 A-5	J1MXW6	12/12/2011	0.263			0.242			0.00910			0.234			0.372		
28 A-6	J1MXW7	12/12/2011	0.183			0.167			0.00505			0.227			0.328		
29 A-7	J1MXW8	12/12/2011	0.715			0.260			0.0119			0.196			0.243		
30 A-8	J1MXW9	12/12/2011	0.402			0.139			0.0115			0.0788			0.155		
31 A-9	J1MXX0	12/12/2011	0.429			0.0971			0.0178			0.0632			0.358		
32 A-11	J1MXX2	12/12/2011	0.406			0.132			0.0117			0.783			0.602		
33 A-12	J1MXX3	12/12/2011	0.507			0.277			0.0104			0.214			0.184		

34 Statistical Computations

35	Technetium-99	Thorium-230	Tritium	Uranium-234	Uranium-238
36 95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.	Radionuclide data set. Use nonparametric z-statistic.
37 N	12	12	12	12	12
38 % < Detection limit	92%	58%	75%	17%	8%
39 Mean	0.407	0.160	0.0122	0.282	0.287
40 Standard deviation	0.137	0.0723	0.00554	0.196	0.147
41 Z-statistic	1.64	1.64	1.64	1.64	1.64
42 95% UCL on mean	0.472	0.195	0.0149	0.375	0.356
43 Maximum value	0.715	0.277	0.0178	0.885	0.698

Washington Closure Hanford

Originator N. K. Schiffern Date 04/03/12
Project 100-D Field Remediation Job No. 14655
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

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Checked I. B. Berezovskiy

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100-D-8 Statistical Calculations

Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Antimony mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	0.87	J	0.35	3.9		0.62	77.4	X	0.071	10.4	X	0.054	5.0	X	0.093	14.7		0.20	4.0		0.25	240	X	0.093
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.96	J	0.38	4.7		0.65	86.8	X	0.075	11.5	X	0.057	5.5	X	0.099	14.7		0.21	4.5		0.27	238	X	0.099
A-1	J1MXW2	12/12/2011	1.5	J	0.35	1.5		0.61	62.1	X	0.071	4.0	X	0.054	7.7	X	0.093	12.9		0.20	2.9		0.25	284	X	0.093
A-2	J1MXW3	12/12/2011	1.2	J	0.34	2.0		0.60	57.7	X	0.069	5.4	X	0.052	7.1	X	0.090	12.6		0.20	3.7		0.24	283	X	0.090
A-3	J1MXW4	12/12/2011	1.1	J	0.36	1.5		0.62	51.8	X	0.072	5.1	X	0.055	6.9	X	0.094	12.1		0.20	3.6		0.25	262	X	0.094
A-4	J1MXW5	12/12/2011	1.4	J	0.36	1.7		0.63	56.3	X	0.073	3.4	X	0.056	8.0	X	0.096	12.7		0.21	4.2		0.26	289	X	0.096
A-5	J1MXW6	12/12/2011	1.2	J	0.37	2.5		0.63	57.7	X	0.073	9.1	X	0.056	7.1	X	0.096	14.1		0.21	3.6		0.26	280	X	0.096
A-6	J1MXW7	12/12/2011	0.52	BJ	0.34	1.8		0.59	59.4	X	0.068	10.9	X	0.052	3.6	X	0.090	9.5		0.20	2.2		0.24	235	X	0.090
A-7	J1MXW8	12/12/2011	0.88	J	0.35	2.0		0.60	49.3	X	0.070	8.6	X	0.053	4.8	X	0.092	10.1		0.20	4.0		0.25	236	X	0.092
A-8	J1MXW9	12/12/2011	1.1	J	0.34	2.8		0.59	61.1	X	0.068	7.6	X	0.052	6.5	X	0.089	13.3		0.19	3.3		0.24	251	X	0.089
A-9	J1MXX0	12/12/2011	1.2	J	0.38	2.0		0.66	54.4	X	0.076	8.6	X	0.058	7.5	X	0.10	14.8		0.22	3.5		0.27	301	X	0.10
A-11	J1MXX2	12/12/2011	1.5	J	0.34	3.2		0.59	55.9	X	0.068	5.3	X	0.052	9.6	X	0.45	16.4		0.97	7.1		1.2	327	X	0.090
A-12	J1MXX3	12/12/2011	1.4	J	0.35	2.0		0.60	60.4	X	0.069	6.1	X	0.053	7.7	X	0.091	15.8		0.20	3.8		0.25	288	X	0.091

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
A-10	J1MXX1/J1MXX4	12/12/2011	0.92	4.3	82.1	11.0	5.3	14.7	4.3	239
A-1	J1MXW2	12/12/2011	1.5	1.5	62.1	4.0	7.7	12.9	2.9	284
A-2	J1MXW3	12/12/2011	1.2	2.0	57.7	5.4	7.1	12.6	3.7	283
A-3	J1MXW4	12/12/2011	1.1	1.5	51.8	5.1	6.9	12.1	3.6	262
A-4	J1MXW5	12/12/2011	1.4	1.7	56.3	3.4	8.0	12.7	4.2	289
A-5	J1MXW6	12/12/2011	1.2	2.5	57.7	9.1	7.1	14.1	3.6	280
A-6	J1MXW7	12/12/2011	0.52	1.8	59.4	10.9	3.6	9.5	2.2	235
A-7	J1MXW8	12/12/2011	0.88	2.0	49.3	8.6	4.8	10.1	4.0	236
A-8	J1MXW9	12/12/2011	1.1	2.8	61.1	7.6	6.5	13.3	3.3	251
A-9	J1MXX0	12/12/2011	1.2	2.0	54.4	8.6	7.5	14.8	3.5	301
A-11	J1MXX2	12/12/2011	1.5	3.2	55.9	5.3	9.6	16.4	7.1	327
A-12	J1MXX3	12/12/2011	1.4	2.0	60.4	6.1	7.7	15.8	3.8	288

Statistical Computations

	Antimony	Arsenic	Barium	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥ 10), use MTCAStat normal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), 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), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%
Mean	1.2	2.3	59.0	7.1	6.8	13.3	3.8	273
Standard deviation	0.29	0.82	8.2	2.6	1.6	2.1	1.2	28.6
95% UCL on mean	1.3	2.7	62.9	9.0	7.6	14.5	4.4	289
Maximum value	1.5	4.7	86.8	11.5	9.6	16.4	7.1	327
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	5 GW & River Protection	20 DE, GW & River Protection	200 GW Protection	18.5 GW & River Protection	15.7 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	NA	NA	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA	NA	NA	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NA	NA	NA	NA
WAC 173-340 Compliance?	Because all values are below background (5 mg/kg) the WAC 173-340 3-part test is not required.	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 (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (10.2 mg/kg) the WAC 173-340 3-part test is not required.	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 N. K. Schiffern NS | Date 04/03/12 | Calc. No. 0100D-CA-V0451 | Rev. No. 0
Project 100-D Field Remediation | Job No. 14655 | Checked I. B. Berezovskiy | Date 04/03/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 7 of 27

100-D-8 Statistical Calculations

Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Nickel mg/kg	Nickel Q	Nickel PQL	Vanadium mg/kg	Vanadium Q	Vanadium PQL	Zinc mg/kg	Zinc Q	Zinc PQL	Chloride mg/kg	Chloride Q	Chloride PQL	Nitrogen in Nitrate mg/kg	Nitrogen in Nitrate Q	Nitrogen in Nitrate PQL	Nitrogen in Nitrite and Nitrate mg/kg	Nitrogen in Nitrite and Nitrate Q	Nitrogen in Nitrite and Nitrate PQL	Sulfate mg/kg	Sulfate Q	Sulfate PQL
A-10	J1MXX1	12/12/2011	12.9	X	0.11	32.2	X	0.088	29.3	X	0.37	1.9	U	1.9	0.82	BJ	0.30	0.81		0.32	2.4	B	1.7
Duplicate of J1MXX1	J1MXX4	12/12/2011	13.5	X	0.12	31.3	X	0.093	29.1	X	0.39	2.0	U	2.0	0.53	BJ	0.32	0.35	B	0.32	1.8	U	1.8
A-1	J1MXW2	12/12/2011	7.0	XM	0.11	58.0	X	0.088	38.9	X	0.37	5.4		2.0	0.53	BMJ	0.32	0.30	U	0.30	4.6	B	1.7
A-2	J1MXW3	12/12/2011	9.4	X	0.11	50.6	X	0.085	35.9	X	0.36	2.4	B	2.0	1.5	BJ	0.32	1.3		0.30	8.3		1.7
A-3	J1MXW4	12/12/2011	7.9	X	0.12	48.4	X	0.089	33.8	X	0.38	2.0	B	2.0	0.89	BJ	0.32	0.74	B	0.31	7.6		1.7
A-4	J1MXW5	12/12/2011	6.6	X	0.12	55.1	X	0.090	38.4	X	0.38	1.9	U	1.9	1.3	BJ	0.31	1.4		0.31	7.9		1.7
A-5	J1MXW6	12/12/2011	11.3	X	0.12	46.8	X	0.090	36.7	X	0.38	6.0		2.0	0.76	BJ	0.32	0.68	B	0.32	31.4		1.8
A-6	J1MXW7	12/12/2011	14.9	X	0.11	13.8	X	0.085	16.9	X	0.36	2.0	U	2.0	0.40	BJ	0.32	0.31	U	0.31	1.8	U	1.8
A-7	J1MXW8	12/12/2011	12.1	X	0.11	28.8	X	0.086	25.2	X	0.36	1.9	U	1.9	2.4	BJ	0.31	2.1		0.30	7.0		1.7
A-8	J1MXW9	12/12/2011	10.3	X	0.11	48.8	X	0.084	34.5	X	0.35	1.9	U	1.9	3.9	J	0.31	3.7		0.31	10.5		1.7
A-9	J1MXX0	12/12/2011	11.7	X	0.12	51.4	X	0.094	37.7	X	0.40	5.3		1.9	1.0	BJ	0.31	0.77	B	0.32	34.7		1.7
A-11	J1MXX2	12/12/2011	8.5	X	0.11	76.8	X	0.42	42.7	X	0.36	2.0	U	2.0	1.3	BJ	0.32	1.0		0.29	11.8		1.8
A-12	J1MXX3	12/12/2011	9.7	X	0.11	52.5	X	0.086	38.6	X	0.36	2.2	B	2.0	4.9	J	0.32	5.0		0.31	18.8		1.8

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	Chloride mg/kg	Nitrogen in Nitrate mg/kg	Nitrogen in Nitrite and Nitrate mg/kg	Sulfate mg/kg
A-10	J1MXX1/J1MXX4	12/12/2011	13.2	31.8	29.2	0.98	0.68	0.58	1.7
A-1	J1MXW2	12/12/2011	7.0	58.0	38.9	5.4	0.53	0.15	4.6
A-2	J1MXW3	12/12/2011	9.4	50.6	35.9	2.4	1.5	1.3	8.3
A-3	J1MXW4	12/12/2011	7.9	48.4	33.8	2.0	0.89	0.74	7.6
A-4	J1MXW5	12/12/2011	6.6	55.1	38.4	0.95	1.3	1.4	7.9
A-5	J1MXW6	12/12/2011	11.3	46.8	36.7	6.0	0.76	0.68	31.4
A-6	J1MXW7	12/12/2011	14.9	13.8	16.9	1.0	0.40	0.16	0.90
A-7	J1MXW8	12/12/2011	12.1	28.8	25.2	0.95	2.4	2.1	7.0
A-8	J1MXW9	12/12/2011	10.3	48.8	34.5	0.95	3.9	3.7	10.5
A-9	J1MXX0	12/12/2011	11.7	51.4	37.7	5.3	1.0	0.77	34.7
A-11	J1MXX2	12/12/2011	8.5	76.8	42.7	1.0	1.3	1.0	11.8
A-12	J1MXX3	12/12/2011	9.7	52.5	38.6	2.2	4.9	5.0	18.8

Statistical Computations

	Nickel	Vanadium	Zinc	Chloride	Nitrogen in Nitrate	Nitrogen in Nitrite and Nitrate	Sulfate
95% UCL based on	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat normal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	50%	0%	17%	8%
Mean	10.2	46.9	34.0	2.4	1.6	1.5	12.1
Standard deviation	2.5	16.0	7.1	2.0	1.4	1.5	10.9
95% UCL on mean	11.8	55.2	37.4	3.4	2.9	4.4	37.4
Maximum value	14.9	76.8	42.7	6.0	4.9	5.0	34.7
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	25000 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NA	NA	NA	NA	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA	NA	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NA	NA	NA
WAC 173-340 Compliance?	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (100 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

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Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

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100-D-8 Maximum Calculations
Verification Data - Excavation

Sample Area	Sample Number	Sample Date	Beryllium mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Mercury mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	0.031	UJ	0.031	0.045	B	0.038	0.012	BN	0.0057
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.033	UJ	0.033	0.063	B	0.041	0.015	BN	0.0055
A-1	J1MXW2	12/12/2011	0.031	UNJ	0.031	0.038	U	0.038	0.0056	UN	0.0056
A-2	J1MXW3	12/12/2011	0.030	UJ	0.030	0.037	U	0.037	0.0052	UN	0.0052
A-3	J1MXW4	12/12/2011	0.031	UJ	0.031	0.039	U	0.039	0.0053	UN	0.0053
A-4	J1MXW5	12/12/2011	0.032	UJ	0.032	0.039	U	0.039	0.0054	UN	0.0054
A-5	J1MXW6	12/12/2011	0.032	UJ	0.032	0.039	U	0.039	0.0056	UN	0.0056
A-6	J1MXW7	12/12/2011	0.034	BJ	0.030	0.041	B	0.037	0.011	BN	0.0057
A-7	J1MXW8	12/12/2011	0.030	UJ	0.030	0.038	U	0.038	0.0080	BN	0.0056
A-8	J1MXW9	12/12/2011	0.029	UJ	0.029	0.036	U	0.036	0.0093	BN	0.0053
A-9	J1MXX0	12/12/2011	0.033	UJ	0.033	0.041	U	0.041	0.0056	UN	0.0056
A-11	J1MXX2	12/12/2011	0.15	UJ	0.15	0.037	U	0.037	0.0055	UN	0.0055
A-12	J1MXX3	12/12/2011	0.030	UJ	0.030	0.037	U	0.037	0.0056	UN	0.0056

Statistical Computations

	Beryllium			Cadmium			Mercury		
% < Detection limit	92%			83%			67%		
Maximum value	0.034			0.063			0.015		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	1.51	GW & River Protection		0.81	GW & River Protection		0.33	GW & River Protection	
WAC 173-340 3-PART TEST									
Maximum > Cleanup Limit?	NA			NA			NA		
> 10% above Cleanup Limit?	NA			NA			NA		
Any sample > 2X Cleanup Limit?	NA			NA			NA		
3-Part Test Compliance?	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.			Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.			Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required.		

CALCULATION SHEET

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Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

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1 100-D-8 Statistical Calculations
2 Verification Data -Overburden

Sample Area	Sample Number	Sample Date	Cesium-137			Nickel-63			Thorium-230			Uranium-234			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
B-10	J1N015	12/13/2011	-0.00850	U	0.0249	3.87	U	12.4	0.261		0.165	0.245		0.116	0.338		0.116
Duplicate of J1N015	J1N018	12/13/2011	0.00978	U	0.0247	0.588	U	13.9	0.132	U	0.111	0.125	U	0.154	0.288		0.154
B-1	J1N006	12/13/2011	0.00413	U	0.0357	2.56	U	12.6	0.144	U	0.137	0.0974	U	0.153	0.108	U	0.101
B-2	J1N007	12/13/2011	-0.00916	U	0.0263	3.00	U	12.9	0.104	U	0.117	0.301		0.160	0.356		0.165
B-3	J1N008	12/13/2011	-0.00459	U	0.0391	20.8		12.6	0.235		0.114	0.135		0.0848	0.110		0.102
B-4	J1N009	12/13/2011	0.00690	U	0.0251	2.97	U	12.5	0.175		0.133	0.216		0.102	0.134		0.102
B-5	J1N010	12/13/2011	0.00280	U	0.0383	5.30	U	13.6	0.136	U	0.140	0.181		0.0848	0.201		0.0946
B-6	J1N011	12/13/2011	0.00771	U	0.0273	4.58	U	13.2	0.0881	U	0.165	0.0891	U	0.0846	0.178		0.0943
B-7	J1N012	12/13/2011	-0.00403	U	0.0393	6.52	U	13.0	0.172	U	0.248	0.188		0.165	0.0384	U	0.154
B-8	J1N013	12/13/2011	0.00534	U	0.0289	-1.41	U	12.8	0.174	U	0.297	0.225		0.137	0.154	U	0.169
B-9	J1N014	12/13/2011	0.138		0.0280	5.03	U	12.8	0.301		0.226	0.172		0.0930	0.122		0.104
B-11	J1N016	12/13/2011	0.000320	U	0.0345	5.37	U	12.9	0.294		0.123	0.244		0.131	0.137	U	0.147
B-12	J1N017	12/13/2011	0.0147	U	0.0375	1.18	U	13.0	0.204		0.129	0.0708	U	0.0899	0.192		0.0899

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19 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Cesium-137 pCi/g			Nickel-63 pCi/g			Thorium-230 pCi/g			Uranium-234 pCi/g			Uranium-238 pCi/g		
B-10	J1N015/J1N018	12/13/2011	0.000640			2.23			0.197			0.185			0.313		
B-1	J1N006	12/13/2011	0.00413			2.56			0.144			0.0974			0.108		
B-2	J1N007	12/13/2011	-0.00916			3.00			0.104			0.301			0.356		
B-3	J1N008	12/13/2011	-0.00459			20.8			0.235			0.135			0.110		
B-4	J1N009	12/13/2011	0.00690			2.97			0.175			0.216			0.134		
B-5	J1N010	12/13/2011	0.00280			5.30			0.136			0.181			0.201		
B-6	J1N011	12/13/2011	0.00771			4.58			0.088			0.0891			0.178		
B-7	J1N012	12/13/2011	-0.00403			6.52			0.172			0.188			0.0384		
B-8	J1N013	12/13/2011	0.00534			-1.41			0.174			0.225			0.154		
B-9	J1N014	12/13/2011	0.138			5.03			0.301			0.172			0.122		
B-11	J1N016	12/13/2011	0.000320			5.37			0.294			0.244			0.137		
B-12	J1N017	12/13/2011	0.0147			1.18			0.204			0.0708			0.192		

34 Statistical Computations

	Cesium-137			Nickel-63			Thorium-230			Uranium-234			Uranium-238		
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.		
N	12			12			12			12			12		
% < Detection limit	92%			92%			50%			25%			33%		
Mean	0.0136			4.84			0.185			0.175			0.170		
Standard deviation	0.0397			5.47			0.0666			0.0681			0.0886		
Z-statistic	1.64			1.64			1.64			1.64			1.64		
95% UCL on mean	0.0324			7.44			0.217			0.208			0.212		
Maximum value	0.138			20.8			0.301			0.301			0.356		

CALCULATION SHEET

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100-D-8 Statistical Calculations
Verification Data - Overburden

Sample Area	Sample Number	Sample Date	Antimony mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL	Manganese mg/kg	Q	PQL
B-10	J1N015	12/13/2011	1.7		0.34	1.3		0.59	55.0	X	0.068	4.2	X	0.052	10.6		0.45	16.8		0.97	2.9		1.2	321	X	0.090
Duplicate of J1N015	J1N018	12/13/2011	1.7		0.37	1.3		0.64	53.7	X	0.073	3.9	X	0.056	10.7		0.48	15.8		1.0	3.1		1.3	326	X	0.096
B-1	J1N006	12/13/2011	1.5		0.37	2.0		0.64	58.2	X	0.073	4.8	X	0.056	9.8		0.48	16.5		1.0	5.4		1.3	333	X	0.096
B-2	J1N007	12/13/2011	1.6		0.37	1.8		0.65	55.6	X	0.075	3.9	X	0.057	9.5		0.49	15.0		1.1	3.1		1.3	305	X	0.098
B-3	J1N008	12/13/2011	1.4		0.39	2.0		0.67	57.4	X	0.077	5.9	X	0.059	8.9		0.51	14.7		1.1	5.3		1.4	313	X	0.10
B-4	J1N009	12/13/2011	1.6		0.37	2.1		0.64	59.7	X	0.073	5.8	X	0.056	9.3		0.48	15.5		1.0	5.4		1.3	316	X	0.097
B-5	J1N010	12/13/2011	1.7		0.49	1.7		0.86	59.2	X	0.099	3.8	X	0.075	17.2		0.65	13.9		1.4	1.7	U	1.7	328	X	0.13
B-6	J1N011	12/13/2011	1.7		0.36	1.1		0.62	55.7	X	0.071	3.9	X	0.054	10.3		0.47	16.1		1.0	2.5		1.3	332	X	0.094
B-7	J1N012	12/13/2011	1.6		0.35	1.6		0.62	50.4	X	0.071	4.0	X	0.054	9.3		0.47	14.6		1.0	2.8		1.3	295	X	0.093
B-8	J1N013	12/13/2011	1.7		0.34	1.7		0.60	52.0	X	0.069	4.2	X	0.052	9.5		0.45	15.8		0.98	3.2		1.2	331	X	0.090
B-9	J1N014	12/13/2011	1.3		0.38	3.2		0.66	88.9	X	0.076	11.3	X	0.058	7.8		0.10	15.1		0.22	5.0		0.27	381	X	0.10
B-11	J1N016	12/13/2011	1.5		0.36	1.3		0.62	55.5	X	0.071	3.7	X	0.054	9.9		0.47	15.5		1.0	2.9		1.3	327	X	0.094
B-12	J1N017	12/13/2011	1.4		0.36	1.5		0.63	47.0	X	0.073	3.7	X	0.056	9.4		0.48	14.7		1.0	2.3	B	1.3	303	X	0.096

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Manganese mg/kg
Area	J1N015/J1N018	Date	1.7	1.3	54.4	4.1	10.7	16.3	3.0	324
B-1	J1N006	12/13/2011	1.5	2.0	58.2	4.8	9.8	16.5	5.4	333
B-2	J1N007	12/13/2011	1.6	1.8	55.6	3.9	9.5	15.0	3.1	305
B-3	J1N008	12/13/2011	1.4	2.0	57.4	5.9	8.9	14.7	5.3	313
B-4	J1N009	12/13/2011	1.6	2.1	59.7	5.8	9.3	15.5	5.4	316
B-5	J1N010	12/13/2011	1.7	1.7	59.2	3.8	17.2	13.9	0.85	328
B-6	J1N011	12/13/2011	1.7	1.1	55.7	3.9	10.3	16.1	2.5	332
B-7	J1N012	12/13/2011	1.6	1.6	50.4	4.0	9.3	14.6	2.8	295
B-8	J1N013	12/13/2011	1.7	1.7	52.0	4.2	9.5	15.8	3.2	331
B-9	J1N014	12/13/2011	1.3	3.2	88.9	11.3	7.8	15.1	5.0	381
B-11	J1N016	12/13/2011	1.5	1.3	55.5	3.7	9.9	15.5	2.9	327
B-12	J1N017	12/13/2011	1.4	1.5	47.0	3.7	9.4	14.7	2.3	303

Statistical Computations

	Antimony	Arsenic	Barium	Chromium	Cobalt	Copper	Lead	Manganese
95% UCL based on	Large data set (n ≥ 10), use MTCAStat normal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	8%	0%
Mean	1.6	1.8	57.8	4.9	10.1	15.3	3.5	324
Standard deviation	0.14	0.54	10.5	2.2	2.3	0.78	1.5	21.9
95% UCL on mean	1.6	2.1	62.8	5.9	11.2	15.7	4.2	334
Maximum value	1.7	3.2	88.9	11.3	17.2	16.8	5.4	381
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	5 GW & River Protection	20 DE, GW & River Protection	200 GW Protection	18.5 GW & River Protection	15.7 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	NA	NO	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA	NA	NO	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NO	NA	NA	NA
WAC 173-340 Compliance?	Because all values are below background (5 mg/kg) the WAC 173-340 3-part test is not required.	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 (18.5 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 (22.0 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (10.2 mg/kg) the WAC 173-340 3-part test is not required.	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 N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
Job No. 14655

Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

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1 100-D-8 Statistical Calculations
2 Verification Data - Overburden

3	Sample	Sample	Sample	Nickel			Vanadium			Zinc			Chloride			Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate			Sulfate			Dimethyl phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
5	B-10	J1N015	12/13/2011	7.9	X	0.11	85.7		0.42	44.0	X	0.36	25.6		2.0	2.6		0.31	2.4		0.30	76.9		1.7	170	JB	23
6	Duplicate of J1N015	J1N018	12/13/2011	8.9	X	0.12	89.0		0.45	46.3	X	0.38	33.8		1.9	3.2		0.30	3.0		0.30	91.5		1.7	120	JB	22
7	B-1	J1N006	12/13/2011	8.2	X	0.12	82.6		0.45	46.1	X	0.38	2.9	B	2.0	1.6	B	0.32	1.6	C	0.30	6.5		1.7	190	JB	23
8	B-2	J1N007	12/13/2011	7.9	X	0.12	74.5		0.46	42.1	X	0.39	2.0	U	2.0	0.66	BM	0.31	0.64	BC	0.30	1.7	U	1.7	170	JB	22
9	B-3	J1N008	12/13/2011	8.5	X	0.12	73.3		0.48	42.6	X	0.40	2.6	B	2.1	0.47	B	0.33	0.63	BC	0.33	7.0		1.8	210	JB	24
10	B-4	J1N009	12/13/2011	9.0	X	0.12	77.7		0.45	43.8	X	0.38	2.8	B	2.0	1.3	B	0.32	1.3	C	0.31	10.1		1.8	240	JB	21
11	B-5	J1N010	12/13/2011	9.8	X	0.16	81.5		0.61	44.2	X	0.52	2.4	U	2.4	0.39	UR	0.39	0.60	BC	0.39	2.1	B	2.1	220	JB	28
12	B-6	J1N011	12/13/2011	8.5	X	0.12	83.0		0.44	43.6	X	0.37	3.1	B	1.9	0.47	B	0.30	0.64	BC	0.31	2.2	B	1.7	120	JB	22
13	B-7	J1N012	12/13/2011	8.3	X	0.11	78.5		0.44	41.4	X	0.37	1.9	U	1.9	1.5	B	0.31	1.5	C	0.31	3.0	B	1.7	120	JB	22
14	B-8	J1N013	12/13/2011	8.3	X	0.11	83.3		0.42	44.2	X	0.36	1.9	U	1.9	0.49	B	0.30	0.54	BC	0.31	1.6	U	1.6	200	JB	22
15	B-9	J1N014	12/13/2011	11.6	X	0.12	50.5		0.094	44.4	X	0.40	6.7		2.0	12.3		0.32	9.6		0.31	8.7		1.7	180	JB	23
16	B-11	J1N016	12/13/2011	7.7	X	0.12	85.1		0.44	45.0	X	0.37	1.9	U	1.9	1.2	B	0.31	1.3	C	0.30	6.0		1.7	160	JB	23
17	B-12	J1N017	12/13/2011	9.2	X	0.12	80.0		0.45	42.6	X	0.38	1.9	U	1.9	1.8	B	0.30	1.8		0.31	4.0	B	1.7	150	JB	22

18 Statistical Computation Input Data

19	Sample	Sample	Sample	Nickel			Vanadium			Zinc			Chloride			Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate			Sulfate			Dimethyl phthalate		
20	Area	Number	Date	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			ug/kg		
21	Area	J1N015/J1N018	Date	8.4			87.4			45.2			29.7			2.9			2.7			84.2			145		
22	B-1	J1N006	12/13/2011	8.2			82.6			46.1			2.9			1.6			1.6			6.5			190		
23	B-2	J1N007	12/13/2011	7.9			74.5			42.1			1.0			0.66			0.64			0.85			170		
24	B-3	J1N008	12/13/2011	8.5			73.3			42.6			2.6			0.47			0.63			7.0			210		
25	B-4	J1N009	12/13/2011	9.0			77.7			43.8			2.8			1.3			1.3			10.1			240		
26	B-5	J1N010	12/13/2011	9.8			81.5			44.2			1.2			0.20			0.60			2.1			220		
27	B-6	J1N011	12/13/2011	8.5			83.0			43.6			3.1			0.47			0.64			2.2			120		
28	B-7	J1N012	12/13/2011	8.3			78.5			41.4			0.95			1.5			1.5			3.0			120		
29	B-8	J1N013	12/13/2011	8.3			83.3			44.2			0.95			0.49			0.54			0.80			200		
30	B-9	J1N014	12/13/2011	11.6			50.5			44.4			6.7			12.3			9.6			8.7			180		
31	B-11	J1N016	12/13/2011	7.7			85.1			45.0			0.95			1.2			1.3			6.0			160		
32	B-12	J1N017	12/13/2011	9.2			80.0			42.6			0.95			1.8			1.8			4.0			150		

33 Statistical Computations

34		Nickel	Vanadium	Zinc	Chloride	Nitrogen in Nitrate	Nitrogen in Nitrite and Nitrate	Sulfate	Dimethyl phthalate
35	95% UCL based on	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.
36	N	12	12	12	12	12	12	12	12
37	% < Detection limit	0%	0%	0%	50%	8%	0%	17%	0%
38	Mean	8.8	78.1	43.8	4.5	2.1	1.9	11.3	175
39	Standard deviation	1.1	9.6	1.4	8.1	3.3	2.5	23.2	38
40	95% UCL on mean	9.3	82.7	44.5	8.3	5.3	3.1	35.3	200
41	Maximum value	11.6	89.0	46.3	33.8	12.3	9.6	91.5	240
42	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted**	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	250000 GW Protection	1000 GW Protection	1000 GW Protection	25000 GW Protection	1600000 ug/kg GW Protection
43	**WAC 173-340 3-PART TEST**								
44	95% UCL > Cleanup Limit?	NA	NO	NA	NA	NO	NA	NA	NO
45	> 10% above Cleanup Limit?	NA	NO	NA	NA	NO	NA	NA	NO
46	Any sample > 2X Cleanup Limit?	NA	NO	NA	NA	NO	NA	NA	NO
47	**WAC 173-340 Compliance?**	Because all values are below background (19.1 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.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (100 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 (11.8 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/04/12
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Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

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100-D-8 Maximum Calculations
Verification Data - Overburden

Sample Area	Sample Number	Sample Date	Boron			Cadmium			Mercury			Molybdenum			Bis(2-ethylhexyl) phthalate			4-4'-DDE		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
B-10	J1N015	12/13/2011	0.88	U	0.88	0.037	U	0.037	0.0051	U	0.0051	0.23	U	0.23	45	U	45	0.24	U	0.24
Duplicate of J1N015	J1N018	12/13/2011	0.94	U	0.94	0.040	U	0.040	0.0051	U	0.0051	0.25	U	0.25	44	U	44	0.23	U	0.23
B-1	J1N006	12/13/2011	0.94	U	0.94	0.039	U	0.039	0.0049	UN	0.0049	0.26	B	0.25	45	U	45	0.23	U	0.23
B-2	J1N007	12/13/2011	0.97	U	0.97	0.040	U	0.040	0.0050	U	0.0050	0.26	U	0.26	92	J	45	0.23	U	0.23
B-3	J1N008	12/13/2011	0.99	U	0.99	0.042	U	0.042	0.0057	U	0.0057	0.26	U	0.26	47	U	47	0.25	U	0.25
B-4	J1N009	12/13/2011	0.95	U	0.95	0.040	U	0.040	0.0056	U	0.0056	0.25	U	0.25	43	U	43	0.22	U	0.22
B-5	J1N010	12/13/2011	1.3	U	1.3	0.053	U	0.053	0.0064	U	0.0064	0.34	U	0.34	56	U	56	0.29	U	0.29
B-6	J1N011	12/13/2011	0.92	U	0.92	0.038	U	0.038	0.0055	U	0.0055	0.24	U	0.24	44	U	44	0.22	U	0.22
B-7	J1N012	12/13/2011	0.91	U	0.91	0.038	U	0.038	0.0054	U	0.0054	0.24	U	0.24	45	U	45	0.23	U	0.23
B-8	J1N013	12/13/2011	0.88	U	0.88	0.037	U	0.037	0.0051	U	0.0051	0.23	U	0.23	45	U	45	0.22	U	0.22
B-9	J1N014	12/13/2011	2.3		0.98	0.069	B	0.041	0.0071	B	0.0054	0.26	U	0.26	46	U	46	0.32	J	0.24
B-11	J1N016	12/13/2011	0.92	U	0.92	0.038	U	0.038	0.0056	U	0.0056	0.24	U	0.24	46	U	46	0.23	U	0.23
B-12	J1N017	12/13/2011	0.94	U	0.94	0.039	U	0.039	0.0050	U	0.0050	0.25	U	0.25	45	U	45	0.23	U	0.23

Statistical Computations

	Boron	Cadmium	Mercury	Molybdenum	Bis(2-ethylhexyl) phthalate	4-4'-DDE
% < Detection limit	92%	92%	92%	92%	92%	92%
Maximum value	2.3	0.069	0.0071	0.26	92	0.32
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	320 GW Protection	0.81 GW & River Protection	0.33 GW & River Protection	8 GW Protection	360 ug/kg River Protection	3.3 ug/kg River Protection
WAC 173-340 3-PART TEST						
Maximum > Cleanup Limit?	NO	NA	NA	NO	NO	NO
> 10% above Cleanup Limit?	NO	NA	NA	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NA	NA	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 WAC 173-340 3-part test is not required.	Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schilfern NS
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
Job No. 14655

Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

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100-D-8 Statistical Calculations
Verification Data -Staging pile Area

Sample Area	Sample Number	Sample Date	Tritium pCi/g	Q	MDA	Uranium-234 pCi/g	Q	MDA	Uranium-238 pCi/g	Q	MDA
C-6	J1N3V9	2/1/2012	0.0261	U	0.0342	0.187		0.0645	0.184		0.0760
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.00472	U	0.0332	0.188		0.0566	0.172		0.0712
C-1 resample[a]	J1NLP4	3/12/2012	0.00341	U	0.0438	0.179		0.0499	0.141		0.0571
C-2	J1N3V5	2/1/2012	0.0175	U	0.0361	0.121	U	0.121	0.228		0.107
C-3 resample[a]	J1NLP5	3/12/2012	0.00157	U	0.0397	0.156		0.0700	0.132		0.0557
C-4	J1N3V7	2/1/2012	0.0310	U	0.0416	0.160		0.0477	0.113		0.0477
C-5	J1N3V8	2/1/2012	0.0135	U	0.0342	0.150		0.0521	0.127		0.0572
C-7	J1N3W0	2/1/2012	0.0153	U	0.0357	0.275		0.0575	0.0997		0.0693
C-8	J1N3W1	2/1/2012	0.0510		0.0479	0.118		0.0497	0.151		0.0624
C-9	J1N3W2	2/1/2012	0.0152	U	0.0437	0.190		0.0773	0.144		0.0822
C-10	J1N3W3	2/1/2012	0.202		0.0259	0.0579	U	0.0942	0.208		0.0829
C-11	J1N3W4	2/1/2012	0.0142	U	0.0249	0.0996		0.0792	0.102		0.0720
C-12	J1N3W5	2/1/2012	0.0203		0.0194	0.138		0.0525	0.0866		0.0525

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Tritium pCi/g			Uranium-234 pCi/g			Uranium-238 pCi/g		
C-6	J1N3V9/J1N3W6	2/1/2012	0.0154			0.188			0.178		
C-1 resamplea	J1NLP4	3/12/2012	0.00341			0.179			0.141		
C-2	J1N3V5	2/1/2012	0.0175			0.0605			0.228		
C-3 resamplea	J1NLP5	3/12/2012	0.00157			0.156			0.132		
C-4	J1N3V7	2/1/2012	0.0310			0.160			0.113		
C-5	J1N3V8	2/1/2012	0.0135			0.150			0.127		
C-7	J1N3W0	2/1/2012	0.0153			0.275			0.100		
C-8	J1N3W1	2/1/2012	0.0510			0.118			0.151		
C-9	J1N3W2	2/1/2012	0.0152			0.190			0.144		
C-10	J1N3W3	2/1/2012	0.202			0.0579			0.208		
C-11	J1N3W4	2/1/2012	0.0142			0.100			0.102		
C-12	J1N3W5	2/1/2012	0.0203			0.138			0.0866		

Statistical Computations

	Tritium			Uranium-234			Uranium-238		
95% UCL based on	Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.		
N	12			12			12		
% < Detection limit	75%			17%			0%		
Mean	0.0334			0.148			0.143		
Standard deviation	0.0546			0.0601			0.0434		
Z-statistic	1.64			1.64			1.64		
95% UCL on mean	0.0593			0.176			0.163		
Maximum value	0.202			0.275			0.228		

CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern NS | Date 04/03/12 | Calc. No. 0100D-CA-V0451 | Rev. No. 0
Project 100-D Field Remediation | Job No. 14655 | Checked I. B. Berezovskiy IBB | Date 04/03/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations | Sheet No. 14 of 27

100-D-8 Statistical Calculations

Verification Data - Staging Pile Area

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL
C-6	J1N3V9	2/1/2012	3.2		0.68	78.5	X	0.079	0.44		0.034	1.0	U	1.0	0.063	B	0.042	8.6	X	0.060	7.6	X	0.10	16.2		0.22
Duplicate of J1N3V9	J1N3W6	2/1/2012	2.6		0.72	64.1	X	0.082	0.45		0.036	1.1	U	1.1	0.060	B	0.044	7.6	X	0.063	7.7	X	0.11	17.1		0.24
C-1 resample[a]	J1NLP4	3/12/2012	3.0		0.67	76.0		0.077	0.54		0.033	1.9	B	0.99	0.080	B	0.042	9.3	X	0.059	7.3	X	0.10	15.1		0.22
C-2	J1N3V5	2/1/2012	2.9		0.71	88.6	X	0.082	0.57		0.036	1.2	B	1.1	0.056	B	0.044	9.9	X	0.062	9.0	X	0.11	17.5		0.23
C-3 resample[a]	J1NLP5	3/12/2012	3.0		0.67	78.3		0.078	0.53		0.034	1.5	B	1.0	0.053	B	0.042	9.4	X	0.059	7.4	X	0.10	16.1		0.22
C-4	J1N3V7	2/1/2012	2.9		0.62	73.7	X	0.071	0.48		0.031	0.92	B	0.92	0.096	B	0.039	8.5	X	0.055	8.4	X	0.094	15.2		0.20
C-5	J1N3V8	2/1/2012	3.1		0.70	102	X	0.081	0.45		0.035	1.5	B	1.0	0.11	B	0.043	9.6	X	0.061	6.4	X	0.11	14.6		0.23
C-7	J1N3W0	2/1/2012	3.4		0.70	84.4	X	0.080	0.49		0.035	1.1	B	1.0	0.073	B	0.043	9.7	X	0.061	8.3	X	0.11	15.5		0.23
C-8	J1N3W1	2/1/2012	2.8		0.68	67.3	X	0.078	0.47		0.034	1.0	U	1.0	0.046	B	0.042	6.4	X	0.060	8.0	X	0.10	14.5		0.22
C-9	J1N3W2	2/1/2012	3.2		0.66	85.6	X	0.076	0.50		0.033	1.4	B	0.98	0.075	B	0.041	11.0	X	0.058	8.0	X	0.10	15.2		0.22
C-10	J1N3W3	2/1/2012	3.0		0.65	78.6	X	0.075	0.48		0.032	0.96	U	0.96	0.040	B	0.040	5.4	X	0.057	8.1	X	0.098	15.0		0.21
C-11	J1N3W4	2/1/2012	1.8		0.60	53.1	X	0.070	0.44		0.030	0.90	U	0.90	0.038	U	0.038	4.0	X	0.053	8.3	X	0.092	14.9		0.20
C-12	J1N3W5	2/1/2012	2.0		0.69	50.1	X	0.079	0.44		0.034	1.0	U	1.0	0.070	B	0.043	3.2	X	0.060	7.5	X	0.10	16.9		0.23

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
C-6	J1N3V9/J1N3W6	2/1/2012	2.9	71.3	0.45	0.53	0.062	8.1	7.7	16.7
C-1 resample[a]	J1NLP4	2/1/2012	3.0	76.0	0.54	1.9	0.080	9.3	7.3	15.1
C-2	J1N3V5	3/12/2012	2.9	88.6	0.57	1.2	0.056	9.9	9.0	17.5
C-3 resample[a]	J1NLP5	2/1/2012	3.0	78.3	0.53	1.5	0.053	9.4	7.4	16.1
C-4	J1N3V7	3/12/2012	2.9	73.7	0.48	0.92	0.096	8.5	8.4	15.2
C-5	J1N3V8	2/1/2012	3.1	102	0.45	1.5	0.11	9.6	6.4	14.6
C-7	J1N3W0	2/1/2012	3.4	84.4	0.49	1.1	0.073	9.7	8.3	15.5
C-8	J1N3W1	2/1/2012	2.8	67.3	0.47	0.50	0.046	6.4	8.0	14.5
C-9	J1N3W2	2/1/2012	3.2	85.6	0.50	1.4	0.075	11.0	8.0	15.2
C-10	J1N3W3	2/1/2012	3.0	78.6	0.48	0.48	0.040	5.4	8.1	15.0
C-11	J1N3W4	2/1/2012	1.8	53.1	0.44	0.45	0.019	4.0	8.3	14.9
C-12	J1N3W5	2/1/2012	2.0	50.1	0.44	0.50	0.070	3.2	7.5	16.9

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper
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 normal distribution.	Large data set (n ≥ 10), use MTCAStat normal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	42%	8%	0%	0%	0%
Mean	2.8	75.8	0.49	1.0	0.065	7.9	7.9	15.6
Standard deviation	0.47	14.5	0.042	0.51	0.025	2.5	0.67	0.97
95% UCL on mean	3.1	85.0	0.51	1.3	0.078	9.1	8.2	16.1
Maximum value	3.4	102	0.57	1.9	0.11	11.0	9.0	17.5
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE, GW & River Protection	200 GW Protection	1.51 GW & River Protection	320 GW Protection	0.81 GW & River Protection	18.5 GW & River Protection	15.7 GW Protection	22.0 River Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	NO	NA	NA	NA	NA
WAC 173-340 Compliance?	Because all values are below background (6.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.

CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern NS | Date 04/03/12 | Calc. No. 0100D-CA-V0451
Project 100-D Field Remediation | Job No. 14655 | Checked I. B. Berezovskiy
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Rev. No. 0 | Date 04/03/12 | Sheet No. 15 of 27

100-D-8 Statistical Calculations

Verification Data - Staging Pile Area

Sample Area	Sample Number	Sample Date	Lead			Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate			Dimethyl phthalate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
C-6	J1N3V9	2/1/2012	3.3		0.28	285	X	0.10	9.6	X	0.13	53.2	X	0.097	36.9	X	0.41	92	JB	50	200	JB	25
Duplicate of J1N3V9	J1N3W6	2/1/2012	3.1		0.29	311	X	0.11	9.4	X	0.13	52.3	X	0.10	37.7	X	0.43	86	JB	47	94	JB	24
C-1 resample[a]	J1NLP4	3/12/2012	4.1		0.27	309	X	0.10	11.4	X	0.12	43.9		0.095	38.2	X	0.40	83	JB	47	24	U	24
C-2	J1N3V5	2/1/2012	5.5		0.29	349	X	0.11	10.7	X	0.13	55.2	X	0.10	42.8	X	0.43	85	JB	47	220	JB	24
C-3 resample[a]	J1NLP5	3/12/2012	3.8		0.28	315	X	0.10	10.3	X	0.13	42.6		0.096	36.1	X	0.41	82	JB	47	24	U	24
C-4	J1N3V7	2/1/2012	5.2		0.25	322	X	0.094	9.4	X	0.12	58.3	X	0.088	42.9	X	0.37	90	JB	50	25	U	25
C-5	J1N3V8	2/1/2012	3.9		0.29	288	X	0.11	9.8	X	0.13	42.5	X	0.10	37.4	X	0.42	83	JB	47	140	JB	23
C-7	J1N3W0	2/1/2012	5.2		0.29	340	X	0.11	11.1	X	0.13	55.5	X	0.099	42.9	X	0.42	92	JB	49	25	U	25
C-8	J1N3W1	2/1/2012	5.5		0.28	313	X	0.10	8.2	X	0.13	58.8	X	0.097	41.4	X	0.41	92	JB	50	230	JB	25
C-9	J1N3W2	2/1/2012	5.5		0.27	349	X	0.10	11.5	X	0.12	50.5	X	0.094	42.6	X	0.40	93	JB	50	25	U	25
C-10	J1N3W3	2/1/2012	4.9		0.26	288	X	0.098	7.4	X	0.12	62.4	X	0.092	41.5	X	0.39	91	JB	50	370	B	25
C-11	J1N3W4	2/1/2012	2.5		0.25	276	X	0.092	6.3	X	0.11	60.0	X	0.086	39.5	X	0.36	86	JB	46	68	JB	23
C-12	J1N3W5	2/1/2012	2.8		0.28	255	X	0.10	5.6	X	0.13	51.0	X	0.098	98.2	X	0.41	85	JB	46	23	U	23

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Lead mg/kg			Manganese mg/kg			Nickel mg/kg			Vanadium mg/kg			Zinc mg/kg			Bis(2-ethylhexyl) phthalate ug/kg			Dimethyl phthalate ug/kg		
C-6	J1N3V9/J1N3W6	2/1/2012	3.2			298			9.5			52.8			37.3			89			147		
C-1 resample[a]	J1NLP4	3/12/2012	4.1			309			11.4			43.9			38.2			83			12		
C-2	J1N3V5	2/1/2012	5.5			349			10.7			55.2			42.8			85			220		
C-3 resample[a]	J1NLP5	3/12/2012	3.8			315			10.3			42.6			36.1			82			12		
C-4	J1N3V7	2/1/2012	5.2			322			9.4			58.3			42.9			90			13		
C-5	J1N3V8	2/1/2012	3.9			288			9.8			42.5			37.4			83			140		
C-7	J1N3W0	2/1/2012	5.2			340			11.1			55.5			42.9			92			13		
C-8	J1N3W1	2/1/2012	5.5			313			8.2			58.8			41.4			92			230		
C-9	J1N3W2	2/1/2012	5.5			349			11.5			50.5			42.6			93			13		
C-10	J1N3W3	2/1/2012	4.9			288			7.4			62.4			41.5			91			370		
C-11	J1N3W4	2/1/2012	2.5			276			6.3			60.0			39.5			86			68		
C-12	J1N3W5	2/1/2012	2.8			255			5.6			51.0			98.2			85			12		

Statistical Computations

	Lead	Manganese	Nickel	Vanadium	Zinc	Bis(2-ethylhexyl) phthalate	Dimethyl phthalate
95% UCL based on	Large data set (n ≥ 10), use MTCAStat normal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat 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), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.
N	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	50%
Mean	4.3	309	9.3	52.8	45.1	88	104
Standard deviation	1.1	29.2	2.0	6.9	16.9	4.0	119
95% UCL on mean	4.9	325	10.3	56.8	53.1	90	160
Maximum value	5.5	349	11.5	62.4	98.2	93	370
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	10.2 GW & River Protection	512 GW Protection	19.1 GW Protection	85.1 GW Protection	67.8 River Protection	360 ug/kg River Protection	1600000 ug/kg GW Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
> 10% above Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
WAC 173-340 Compliance?	Because all values are below background (10.2 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern NS Date 04/03/12
Project 100-D Field Remediation Job No. 14655
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy IBB

Rev. No. 0
Date 04/03/12
Sheet No. 16 of 27

1 100-D-8 Statistical Calculations
2 Verification Data - Staging Pile Area

3	Sample	Sample	Sample	Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate			Sulfate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	C-6	J1N3V9	2/1/2012	0.85	B	0.32	0.50	B	0.33	14.1		1.8
6	Duplicate of J1N3V9	J1N3W6	2/1/2012	0.70	B	0.33	0.33	B	0.33	8.7		1.8
7	C-1	J1N3V4	2/1/2012	1.2	B	0.34	1.5		0.33	3.4	B	1.9
8	C-2	J1N3V5	2/1/2012	0.76	B	0.34	0.81	B	0.33	5.3	B	1.9
9	C-3	J1N3V6	2/1/2012	0.35	B	0.34	0.33	U	0.33	1.9	U	1.9
10	C-4	J1N3V7	2/1/2012	0.60	B	0.33	0.33	U	0.33	2.7	B	1.8
11	C-5	J1N3V8	2/1/2012	0.34	UR	0.34	0.33	U	0.33	1.9	B	1.9
12	C-7	J1N3W0	2/1/2012	0.33	UR	0.33	0.33	U	0.33	1.8	U	1.8
13	C-8	J1N3W1	2/1/2012	0.48	B	0.34	0.34	B	0.34	3.8	B	1.9
14	C-9	J1N3W2	2/1/2012	0.35	UR	0.35	0.34	U	0.34	1.9	U	1.9
15	C-10	J1N3W3	2/1/2012	0.53	B	0.33	0.39	B	0.32	1.8	U	1.8
16	C-11	J1N3W4	2/1/2012	0.50	B	0.33	0.37	B	0.32	1.8	U	1.8
17	C-12	J1N3W5	2/1/2012	5.1		0.32	11.4		0.32	4.1	B	1.8

18 Statistical Computation Input Data

19	Sample	Sample	Sample	Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate			Sulfate		
20	Area	Number	Date	mg/kg			mg/kg			mg/kg		
21	C-6	J1N3V9/J1N3W6	2/1/2012	0.78			0.42			11.4		
22	C-1	J1N3V4	2/1/2012	1.2			1.5			3.4		
23	C-2	J1N3V5	2/1/2012	0.76			0.81			5.3		
24	C-3	J1N3V6	2/1/2012	0.35			0.17			0.95		
25	C-4	J1N3V7	2/1/2012	0.60			0.17			2.7		
26	C-5	J1N3V8	2/1/2012	0.17			0.17			1.9		
27	C-7	J1N3W0	2/1/2012	0.17			0.17			0.90		
28	C-8	J1N3W1	2/1/2012	0.48			0.34			3.8		
29	C-9	J1N3W2	2/1/2012	0.18			0.17			0.95		
30	C-10	J1N3W3	2/1/2012	0.53			0.39			0.90		
31	C-11	J1N3W4	2/1/2012	0.50			0.37			0.90		
32	C-12	J1N3W5	2/1/2012	5.1			11.4			4.1		

33 Statistical Computations

34		Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate			Sulfate		
35	95% UCL based on	Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.			Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.			Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.		
36	N	12			12			12		
37	% < Detection limit	25%			42%			42%		
38	Mean	0.90			1.3			3.1		
39	Standard deviation	1.4			3.2			3.0		
40	95% UCL on mean	1.5			2.9			4.5		
41	Maximum value	5.1			11.4			14.1		
42	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	1000 GW Protection			1000 GW Protection			25000 GW Protection		
43	**WAC 173-340 3-PART TEST**									
44	95% UCL > Cleanup Limit?	NA			NA			NA		
45	> 10% above Cleanup Limit?	NA			NA			NA		
46	Any sample > 2X Cleanup Limit?	NA			NA			NA		
47	**WAC 173-340 Compliance?**	Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.			Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required.			Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required.		

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern NS Date 04/03/12 Calc. No. 0100D-CA-V0451 Rev. No. 0
Project 100-D Field Remediation Job No. 14655 Checked I. B. Berezovskiy IBB Date 04/03/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations Sheet No. 17 of 27

100-D-8 Maximum Calculations
Verification Data - Staging Pilea Area

Sample Area	Sample Number	Sample Date	Antimony			Hexavalent Chromium			Mercury			Anthracene (PAH)			Benzo(a)anthracene (PAH)			Benzo(a)pyrene (PAH)			Benzo(b)fluoranthene (PAH)			Benzo(ghi)perylene (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
C-6	J1N3V9	2/1/2012	0.39	U	0.39	0.155	U	0.155	0.0061	U	0.0061	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
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.41	U	0.41	0.155	U	0.155	0.064		0.0053	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
C-1 resample[a]	J1NLP4	3/12/2012	0.41	B	0.38	0.155	U	0.155	0.0064	U	0.0064	3.2	U	3.2	3.3	UN	3.3	6.7	U	6.7	4.4	UN	4.4	7.5	UN	7.5
C-2	J1N3V5	2/1/2012	0.41	U	0.41	0.155	U	0.155	0.0063	U	0.0063	3.4	U	3.4	3.5	U	3.5	7.1	U	7.1	4.7	U	4.7	8.0	U	8.0
C-3 resample[a]	J1NLP5	3/12/2012	0.39	U	0.39	0.155	U	0.155	0.0053	U	0.0053	3.2	U	3.2	3.3	U	3.3	6.7	U	6.7	4.4	U	4.4	7.5	U	7.5
C-4	J1N3V7	2/1/2012	0.36	U	0.36	0.155	U	0.155	0.0065	U	0.0065	3.1	U	3.1	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3	7.4	U	7.4
C-5	J1N3V8	2/1/2012	0.40	U	0.40	0.155	U	0.155	0.0068	U	0.0068	3.1	U	3.1	3.3	U	3.3	6.6	U	6.6	4.3	U	4.3	7.4	U	7.4
C-7	J1N3W0	2/1/2012	0.40	U	0.40	0.155	U	0.155	0.0059	U	0.0059	3.1	U	3.1	3.3	U	3.3	6.6	U	6.6	4.9	J	4.3	7.4	U	7.4
C-8	J1N3W1	2/1/2012	0.39	U	0.39	0.155	U	0.155	0.0060	U	0.0060	3.4	U	3.4	15	J	3.6	8.1	J	7.1	4.7	U	4.7	8.0	U	8.0
C-9	J1N3W2	2/1/2012	0.38	U	0.38	0.213		0.155	0.0055	U	0.0055	3.3	U	3.3	3.4	U	3.4	6.9	U	6.9	4.5	U	4.5	7.7	U	7.7
C-10	J1N3W3	2/1/2012	0.37	U	0.37	0.155	U	0.155	0.0057	U	0.0057	3.2	U	3.2	9.0	J	3.3	9.6	J	8.7	11	J	4.4	7.5	U	7.5
C-11	J1N3W4	2/1/2012	0.35	U	0.35	0.155	U	0.155	0.0052	U	0.0052	3.2	U	3.2	3.4	U	3.4	8.7	J	6.8	9.1	J	4.5	7.6	U	7.6
C-12	J1N3W5	2/1/2012	0.40	U	0.40	0.155	U	0.155	0.0053	U	0.0053	6.6	JX	3.0	180	X	3.1	100		6.3	120		4.1	44		7.1

Statistical Computations

	Antimony			Hexavalent Chromium			Mercury			Anthracene (PAH)			Benzo(a)anthracene (PAH)			Benzo(a)pyrene (PAH)			Benzo(b)fluoranthene (PAH)			Benzo(ghi)perylene (PAH)		
% < Detection limit	92%			92%			92%			92%			75%			67%			67%			92%		
Maximum value	0.41			0.213			0.064			6.6			180			100			120			44		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless otherwise noted	5	GW & River Protection		2	River Protection		0.33	GW & River 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	
WAC 173-340 3-PART TEST																								
Maximum > Cleanup Limit?	NA			NO			NA			NA			YES			YES			YES			NO		
> 10% above Cleanup Limit?	NA			NO			NA			NA			YES			NO			NO			NO		
Any sample > 2X Cleanup Limit?	NA			NO			NA			NA			YES			YES			YES			NO		
3-Part Test Compliance?	Because all values are below background (5 mg/kg) the WAC 173-340 3-part test is not required.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.			A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.			A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.		

Sample Area	Sample Number	Sample Date	Benzo(k)fluoranthene (PAH)			Chrysene (PAH)			Dibenz(a,h)anthracene (PAH)			Fluoranthene (PAH)			Indeno(1,2,3-cd)pyrene (PAH)			Phenanthrene (PAH)			Pyrene (PAH)			Phenol		
			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
C-6	J1N3V9	2/1/2012	4.0	U	4.0	4.9	U	4.9	11	U	11	13	U	13	12	U	12	12	U	12	12	U	12	20	U	20
Duplicate of J1N3V9	J1N3W6	2/1/2012	4.0	U	4.0	4.9	U	4.9	11	U	11	13	U	13	12	U	12	12	U	12	12	U	12	18	U	18
C-1 resample[a]	J1NLP4	3/12/2012	4.1	UN	4.1	5.1	UN	5.1	12	U	12	14	U	14	13	UN	13	13	U	13	13	U	13	18	U	18
C-2	J1N3V5	2/1/2012	4.4	U	4.4	5.4	U	5.4	12	U	12	14	U	14	13	U	13	13	U	13	13	U	13	19	U	19
C-3 resample[a]	J1NLP5	3/12/2012	4.1	U	4.1	5.1	U	5.1	12	U	12	14	U	14	13	U	13	13	U	13	13	U	13	19	U	19
C-4	J1N3V7	2/1/2012	4.0	U	4.0	5.0	U	5.0	11	U	11	13	U	13	12	U	12	12	U	12	12	U	12	35	J	20
C-5	J1N3V8	2/1/2012	4.0	U	4.0	5.0	U	5.0	11	U	11	13	U	13	12	U	12	12	U	12	12	U	12	18	U	18
C-7	J1N3W0	2/1/2012	4.0	U	4.0	5.0	U	5.0	11	U	11	13	U	13	12	U	12	12	U	12	12	U	12	46	J	19
C-8	J1N3W1	2/1/2012	4.4	U	4.4	12	J	5.4	12	U	12	21	J	14	13	U	13	13	U	13	25	JY	13	19	U	19
C-9	J1N3W2	2/1/2012	4.2	U	4.2	5.2	U	5.2	12	U	12	14	U	14	13	U	13	13	U	13	13	U	13	50	J	20
C-10	J1N3W3	2/1/2012	4.1	U	4.1	9.6	J	5.0	11	U	11	13	U	13	12	U	12	12	U	12	12	U	12	19	U	19
C-11	J1N3W4	2/1/2012	4.2	U	4.2	7.1	J	5.1	12	U	12	14	U	14	13	U	13	13	U	13	13	U	13	18	U	18
C-12	J1N3W5	2/1/2012	67		3.9	150		4.7	12	JX	11	300		13	62		12	96		12	320		12	22	J	18

Statistical Computations

	Benzo(k)fluoranthene (PAH)			Chrysene (PAH)			Dibenz(a,h)anthracene (PAH)			Fluoranthene (PAH)			Indeno(1,2,3-cd)pyrene (PAH)			Phenanthrene (PAH)			Pyrene (PAH)			Phenol		
% < Detection limit	92%			67%			92%			83%			92%			92%			83%			67%		
Maximum value	67			150			12			300			62			96			320			50		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (ug/kg)	15	GW & River Protection		100	River Protection		30	GW & River Protection		18000	River Protection		330	GW & River Protection		240000	GW Protection		48000	GWProtection		480000	GW Protection	
WAC 173-340 3-PART TEST																								
Maximum > Cleanup Limit?	YES			YES			NO			NO			NO			NO			NO			NO		
> 10% above Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO			NO		
Any sample > 2X Cleanup Limit?	YES			NO			NO			NO			NO			NO			NO			NO		
3-Part Test Compliance?	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.			A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			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 N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
Job No. 14655

Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

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100-D-8 Maximum Calculations
Verification Data - Staging Pile Area

Sample Area	Sample Number	Sample Date	Dieldrin ug/kg	Dieldrin Q	Dieldrin PQL	4-4'-DDE ug/kg	4-4'-DDE Q	4-4'-DDE PQL
C-6	J1N3V9	2/1/2012	0.22	U	0.22	0.25	U	0.25
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.21	U	0.21	0.25	U	0.25
C-1 resample[a]	J1NLP4	3/12/2012	0.36	JX	0.22	0.26	JX	0.25
C-2	J1N3V5	2/1/2012	0.23	U	0.23	0.26	U	0.26
C-3 resample[a]	J1NLP5	3/12/2012	0.21	U	0.21	0.24	U	0.24
C-4	J1N3V7	2/1/2012	0.23	U	0.23	0.26	U	0.26
C-5	J1N3V8	2/1/2012	0.22	U	0.22	0.25	U	0.25
C-7	J1N3W0	2/1/2012	0.22	U	0.22	0.25	U	0.25
C-8	J1N3W1	2/1/2012	0.22	U	0.22	0.25	U	0.25
C-9	J1N3W2	2/1/2012	0.23	U	0.23	0.26	U	0.26
C-10	J1N3W3	2/1/2012	0.22	U	0.22	0.25	U	0.25
C-11	J1N3W4	2/1/2012	0.22	U	0.22	0.25	U	0.25
C-12	J1N3W5	2/1/2012	0.21	U	0.21	0.24	U	0.24

Statistical Computations

	Dieldrin	4-4'-DDE
% < Detection limit	92%	92%
Maximum value	0.36	0.26
Most Stringent Cleanup Limit for nonradionuclide and RAG type (ug/kg)	3.3 GW & River Protection	3.3 River Protection
WAC 173-340 3-PART TEST		
Maximum > Cleanup Limit?	NO	NO
> 10% above Cleanup Limit?	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO
3-Part Test Compliance?	The data set meets the 3-part test criteria when compared to the most stringent RAG.	The data set meets the 3-part test criteria when compared to the most stringent RAG.

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
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Calc. No. 0100D-CA-V0451
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Ecology Software (MTCAStat) Results, 100-D-8 Waste Site Excavation

Antimony 95% UCL Calculation

DATA	ID
0.92	J1MXX1/J1MXX4
1.5	J1MXW2
1.2	J1MXW3
1.1	J1MXW4
1.4	J1MXW5
1.2	J1MXW6
0.52	J1MXW7
0.88	J1MXW8
1.1	J1MXW9
1.2	J1MXX0
1.5	J1MXX2
1.4	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.2
Lognormal mean 1.2
Std. devn. 0.29
Median 1.2
Min. 0.52
Max. 1.5

Lognormal distribution? Normal distribution?
r-squared is: 0.828 r-squared is: 0.920
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 1.3

Arsenic 95% UCL Calculation

DATA	ID
4.3	J1MXX1/J1MXX4
1.5	J1MXW2
2.0	J1MXW3
1.5	J1MXW4
1.7	J1MXW5
2.5	J1MXW6
1.8	J1MXW7
2.0	J1MXW8
2.8	J1MXW9
2.0	J1MXX0
3.2	J1MXX2
2.0	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 2.3
Lognormal mean 2.3
Std. devn. 0.82
Median 2.0
Min. 1.5
Max. 4.3

Lognormal distribution? Normal distribution?
r-squared is: 0.908 r-squared is: 0.822
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.7

Barium 95% UCL Calculation

DATA	ID
82.1	J1MXX1/J1MXX4
62.1	J1MXW2
57.7	J1MXW3
51.8	J1MXW4
56.3	J1MXW5
57.7	J1MXW6
59.4	J1MXW7
49.3	J1MXW8
61.1	J1MXW9
54.4	J1MXX0
55.9	J1MXX2
60.4	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 59.0
Lognormal mean 59.0
Std. devn. 8.2
Median 57.7
Min. 49.3
Max. 82.1

Lognormal distribution? Normal distribution?
r-squared is: 0.815 r-squared is: 0.748
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 62.9

Chromium 95% UCL Calculation

DATA	ID
11.0	J1MXX1/J1MXX4
4.0	J1MXW2
5.4	J1MXW3
5.1	J1MXW4
3.4	J1MXW5
9.1	J1MXW6
10.9	J1MXW7
8.6	J1MXW8
7.6	J1MXW9
8.6	J1MXX0
5.3	J1MXX2
6.1	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 7.1
Lognormal mean 7.2
Std. devn. 2.6
Median 6.9
Min. 3.4
Max. 11.0

Lognormal distribution? Normal distribution?
r-squared is: 0.957 r-squared is: 0.954
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 9.0

Cobalt 95% UCL Calculation

DATA	ID
5.3	J1MXX1/J1MXX4
7.7	J1MXW2
7.1	J1MXW3
6.9	J1MXW4
8	J1MXW5
7.1	J1MXW6
3.6	J1MXW7
4.8	J1MXW8
6.5	J1MXW9
7.5	J1MXX0
9.6	J1MXX2
7.7	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 6.8
Lognormal mean 6.9
Std. devn. 1.6
Median 7.1
Min. 3.6
Max. 9.6

Lognormal distribution? Normal distribution?
r-squared is: 0.878 r-squared is: 0.933
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 7.6

Copper 95% UCL Calculation

DATA	ID
14.7	J1MXX1/J1MXX4
12.9	J1MXW2
12.6	J1MXW3
12.1	J1MXW4
12.7	J1MXW5
14.1	J1MXW6
9.5	J1MXW7
10.1	J1MXW8
13.3	J1MXW9
14.8	J1MXX0
16.4	J1MXX2
15.8	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 13.3
Lognormal mean 13.3
Std. devn. 2.1
Median 13.1
Min. 9.5
Max. 16.4

Lognormal distribution? Normal distribution?
r-squared is: 0.943 r-squared is: 0.968
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.5

Lead 95% UCL Calculation

DATA	ID
4.3	J1MXX1/J1MXX4
2.9	J1MXW2
3.7	J1MXW3
3.6	J1MXW4
4.2	J1MXW5
3.6	J1MXW6
2.2	J1MXW7
4.0	J1MXW8
3.3	J1MXW9
3.5	J1MXX0
7.1	J1MXX2
3.8	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 3.8
Lognormal mean 3.9
Std. devn. 1.2
Median 3.7
Min. 2.2
Max. 7.1

Lognormal distribution? Normal distribution?
r-squared is: 0.856 r-squared is: 0.751
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 4.4

Manganese 95% UCL Calculation

DATA	ID
239	J1MXX1/J1MXX4
284	J1MXW2
283	J1MXW3
262	J1MXW4
289	J1MXW5
280	J1MXW6
235	J1MXW7
236	J1MXW8
251	J1MXW9
301	J1MXX0
327	J1MXX2
288	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 273
Lognormal mean 273
Std. devn. 28.6
Median 282
Min. 235
Max. 327

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

UCL (Land's method) is 289

Nickel 95% UCL Calculation

DATA	ID
13.2	J1MXX1/J1MXX4
7.0	J1MXW2
9.4	J1MXW3
7.9	J1MXW4
6.6	J1MXW5
11.3	J1MXW6
14.9	J1MXW7
12.1	J1MXW8
10.3	J1MXW9
11.7	J1MXX0
8.5	J1MXX2
9.7	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 10.2
Lognormal mean 10.2
Std. devn. 2.5
Median 10.0
Min. 6.6
Max. 14.9

Lognormal distribution? Normal distribution?
r-squared is: 0.988 r-squared is: 0.985
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.8

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
Job No. 14655

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Ecology Software (MTCAStat) Results, 100-D-8 Waste Site Excavation

Vanadium 95% UCL Calculation

DATA	ID
31.8	J1MXX1/J1MXX4
58.0	J1MXW2
50.6	J1MXW3
48.4	J1MXW4
55.1	J1MXW5
46.8	J1MXW6
13.8	J1MXW7
28.8	J1MXW8
48.8	J1MXW9
51.4	J1MXX0
76.8	J1MXX2
52.5	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 46.9
Lognormal mean 48.1
Std. devn. 16.0
Median 49.7
Min. 13.8
Max. 76.8

Lognormal distribution? Normal distribution?
r-squared is: 0.789 r-squared is: 0.903
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 55.2

Zinc 95% UCL Calculation

DATA	ID
29.2	J1MXX1/J1MXX4
38.9	J1MXW2
35.9	J1MXW3
33.8	J1MXW4
38.4	J1MXW5
36.7	J1MXW6
16.9	J1MXW7
25.2	J1MXW8
34.5	J1MXW9
37.7	J1MXX0
42.7	J1MXX2
38.6	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 34.0
Lognormal mean 34.3
Std. devn. 7.1
Median 36.3
Min. 16.9
Max. 42.7

Lognormal distribution? Normal distribution?
r-squared is: 0.762 r-squared is: 0.850
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 37.4

Chloride 95% UCL Calculation

DATA	ID
0.98	J1MXX1/J1MXX4
5.4	J1MXW2
2.4	J1MXW3
2.0	J1MXW4
0.95	J1MXW5
6.0	J1MXW6
1.0	J1MXW7
0.95	J1MXW8
0.95	J1MXW9
5.3	J1MXX0
1.0	J1MXX2
2.2	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 2.4
Lognormal mean 2.4
Std. devn. 2.0
Median 1.5
Min. 0.95
Max. 6.0

Lognormal distribution? Normal distribution?
r-squared is: 0.820 r-squared is: 0.758
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 3.4

Nitrogen in Nitrate 95% UCL Calculation

DATA	ID
0.68	J1MXX1/J1MXX4
0.53	J1MXW2
1.5	J1MXW3
0.89	J1MXW4
1.3	J1MXW5
0.76	J1MXW6
0.40	J1MXW7
2.4	J1MXW8
3.9	J1MXW9
1.0	J1MXX0
1.3	J1MXX2
4.9	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.6
Lognormal mean 1.6
Std. devn. 1.4
Median 1.2
Min. 0.40
Max. 4.9

Lognormal distribution? Normal distribution?
r-squared is: 0.965 r-squared is: 0.782
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.9

Nitrogen in Nitrite and Nitrate 95% UCL Calculation

DATA	ID
0.58	J1MXX1/J1MXX4
0.15	J1MXW2
1.3	J1MXW3
0.74	J1MXW4
1.4	J1MXW5
0.68	J1MXW6
0.16	J1MXW7
2.1	J1MXW8
3.7	J1MXW9
0.77	J1MXX0
1.0	J1MXX2
5.0	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.5
Lognormal mean 1.6
Std. devn. 1.5
Median 0.89
Min. 0.15
Max. 5.0

Lognormal distribution? Normal distribution?
r-squared is: 0.949 r-squared is: 0.788
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.4

Sulfate 95% UCL Calculation

DATA	ID
1.7	J1MXX1/J1MXX4
4.6	J1MXW2
8.3	J1MXW3
7.6	J1MXW4
7.9	J1MXW5
31.4	J1MXW6
0.90	J1MXW7
7.0	J1MXW8
10.5	J1MXW9
34.7	J1MXX0
11.8	J1MXX2
18.8	J1MXX3

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 12.1
Lognormal mean 14.0
Std. devn. 10.9
Median 8.1
Min. 0.90
Max. 34.7

Lognormal distribution? Normal distribution?
r-squared is: 0.932 r-squared is: 0.829
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 37.4

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

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Ecology Software (MTCAStat) Results, 100-D-8 Waste Site Overburden

Antimony 95% UCL Calculation

DATA	ID
1.7	J1N015/J1N018
1.5	J1N006
1.6	J1N007
1.4	J1N008
1.6	J1N009
1.7	J1N010
1.7	J1N011
1.6	J1N012
1.7	J1N013
1.3	J1N014
1.5	J1N016
1.4	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.6
Lognormal mean 1.6
Std. devn. 0.14
Median 1.6
Min. 1.3
Max. 1.7

Lognormal distribution? Normal distribution?
r-squared is: 0.894 r-squared is: 0.901
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 1.6

Arsenic 95% UCL Calculation

DATA	ID
1.3	J1N015/J1N018
2.0	J1N006
1.8	J1N007
2.0	J1N008
2.1	J1N009
1.7	J1N010
1.1	J1N011
1.6	J1N012
1.7	J1N013
3.2	J1N014
1.3	J1N016
1.5	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.8
Lognormal mean 1.8
Std. devn. 0.54
Median 1.7
Min. 1.1
Max. 3.2

Lognormal distribution? Normal distribution?
r-squared is: 0.939 r-squared is: 0.843
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 2.1

Barium 95% UCL Calculation

DATA	ID
54.4	J1N015/J1N018
58.2	J1N006
55.6	J1N007
57.4	J1N008
59.7	J1N009
59.2	J1N010
55.7	J1N011
50.4	J1N012
52.0	J1N013
88.9	J1N014
55.5	J1N016
47.0	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 57.8
Lognormal mean 57.8
Std. devn. 10.5
Median 55.7
Min. 47.0
Max. 88.9

Lognormal distribution? Normal distribution?
r-squared is: 0.725 r-squared is: 0.640
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 62.8

Chromium 95% UCL Calculation

DATA	ID
4.1	J1N015/J1N018
4.8	J1N006
3.9	J1N007
5.9	J1N008
5.8	J1N009
3.8	J1N010
3.9	J1N011
4.0	J1N012
4.2	J1N013
11.3	J1N014
3.7	J1N016
3.7	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 4.9
Lognormal mean 4.9
Std. devn. 2.2
Median 4.0
Min. 3.7
Max. 11.3

Lognormal distribution? Normal distribution?
r-squared is: 0.696 r-squared is: 0.578
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 5.9

Cobalt 95% UCL Calculation

DATA	ID
10.7	J1N015/J1N018
9.8	J1N006
9.5	J1N007
8.9	J1N008
9.3	J1N009
17.2	J1N010
10.3	J1N011
9.3	J1N012
9.5	J1N013
7.8	J1N014
9.9	J1N016
9.4	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 10.1
Lognormal mean 10.1
Std. devn. 2.3
Median 9.5
Min. 7.8
Max. 17.2

Lognormal distribution? Normal distribution?
r-squared is: 0.675 r-squared is: 0.580
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 11.2

Copper 95% UCL Calculation

DATA	ID
16.3	J1N015/J1N018
16.5	J1N006
15.0	J1N007
14.7	J1N008
15.5	J1N009
13.9	J1N010
16.1	J1N011
14.6	J1N012
15.8	J1N013
15.1	J1N014
15.5	J1N016
14.7	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 15.3
Lognormal mean 15.3
Std. devn. 0.78
Median 15.3
Min. 13.9
Max. 16.5

Lognormal distribution? Normal distribution?
r-squared is: 0.974 r-squared is: 0.976
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 15.7

Lead 95% UCL Calculation

DATA	ID
3.0	J1N015/J1N018
5.4	J1N006
3.1	J1N007
5.3	J1N008
5.4	J1N009
0.85	J1N010
2.5	J1N011
2.8	J1N012
3.2	J1N013
5.0	J1N014
2.9	J1N016
2.3	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 3.5
Lognormal mean 3.6
Std. devn. 1.5
Median 3.1
Min. 0.85
Max. 5.4

Lognormal distribution? Normal distribution?
r-squared is: 0.827 r-squared is: 0.892
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 4.2

Manganese 95% UCL Calculation

DATA	ID
324	J1N015/J1N018
333	J1N006
305	J1N007
313	J1N008
316	J1N009
328	J1N010
332	J1N011
295	J1N012
331	J1N013
381	J1N014
327	J1N016
303	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 324
Lognormal mean 324
Std. devn. 21.9
Median 325
Min. 295
Max. 381

Lognormal distribution? Normal distribution?
r-squared is: 0.864 r-squared is: 0.837
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 334

Nickel 95% UCL Calculation

DATA	ID
8.4	J1N015/J1N018
8.2	J1N006
7.9	J1N007
8.5	J1N008
9.0	J1N009
9.8	J1N010
8.5	J1N011
8.3	J1N012
8.3	J1N013
11.6	J1N014
7.7	J1N016
9.2	J1N017

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 8.8
Lognormal mean 8.8
Std. devn. 1.1
Median 8.5
Min. 7.7
Max. 11.6

Lognormal distribution? Normal distribution?
r-squared is: 0.829 r-squared is: 0.783
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 9.3

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
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Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

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Ecology Software (MTCAStat) Results, 100-D-8 Waste Site Overburden

Vanadium 95% UCL Calculation

DATA	ID
87.4	J1N015/J1N018
82.6	J1N006
74.5	J1N007
73.3	J1N008
77.7	J1N009
81.5	J1N010
83.0	J1N011
78.5	J1N012
83.3	J1N013
50.5	J1N014
85.1	J1N016
80.0	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	78.1
Censored		Lognormal mean	78.3
Detection limit or PQL		Std. devn.	9.6
Method detection limit		Median	80.8
TOTAL	12	Min.	50.5
		Max.	87.4

Lognormal distribution?	Normal distribution?
r-squared is: 0.641	r-squared is: 0.712

Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 82.7

Zinc 95% UCL Calculation

DATA	ID
45.2	J1N015/J1N018
46.1	J1N006
42.1	J1N007
42.6	J1N008
43.8	J1N009
44.2	J1N010
43.6	J1N011
41.4	J1N012
44.2	J1N013
44.4	J1N014
45.0	J1N016
42.6	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	43.8
Censored		Lognormal mean	43.8
Detection limit or PQL		Std. devn.	1.4
Method detection limit		Median	44.0
TOTAL	12	Min.	41.4
		Max.	46.1

Lognormal distribution?	Normal distribution?
r-squared is: 0.978	r-squared is: 0.979

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 44.5

Chloride 95% UCL Calculation

DATA	ID
29.7	J1N015/J1N018
2.9	J1N006
1.0	J1N007
2.6	J1N008
2.8	J1N009
1.2	J1N010
3.1	J1N011
0.95	J1N012
0.95	J1N013
6.7	J1N014
0.95	J1N016
0.95	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	4.5
Censored		Lognormal mean	3.8
Detection limit or PQL		Std. devn.	8.1
Method detection limit		Median	1.9
TOTAL	12	Min.	0.95
		Max.	29.7

Lognormal distribution?	Normal distribution?
r-squared is: 0.794	r-squared is: 0.452

Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 8.3

Nitrogen in Nitrate 95% UCL Calculation

DATA	ID
2.9	J1N015/J1N018
1.6	J1N006
0.66	J1N007
0.47	J1N008
1.3	J1N009
0.20	J1N010
0.47	J1N011
1.5	J1N012
0.49	J1N013
12.3	J1N014
1.2	J1N016
1.8	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	2.1
Censored		Lognormal mean	2.0
Detection limit or PQL		Std. devn.	3.3
Method detection limit		Median	1.3
TOTAL	12	Min.	0.20
		Max.	12.3

Lognormal distribution?	Normal distribution?
r-squared is: 0.929	r-squared is: 0.502

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.3

Nitrogen in Nitrite and Nitrate 95% UCL Calculation

DATA	ID
2.7	J1N015/J1N018
1.6	J1N006
0.64	J1N007
0.63	J1N008
1.3	J1N009
0.60	J1N010
0.64	J1N011
1.5	J1N012
0.54	J1N013
9.6	J1N014
1.3	J1N016
1.8	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	1.9
Censored		Lognormal mean	1.8
Detection limit or PQL		Std. devn.	2.5
Method detection limit		Median	1.3
TOTAL	12	Min.	0.54
		Max.	9.6

Lognormal distribution?	Normal distribution?
r-squared is: 0.848	r-squared is: 0.520

Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 3.1

Sulfate 95% UCL Calculation

DATA	ID
84.2	J1N015/J1N018
6.5	J1N006
0.85	J1N007
7.0	J1N008
10.1	J1N009
2.1	J1N010
2.2	J1N011
3.0	J1N012
0.80	J1N013
8.7	J1N014
6.0	J1N016
4.0	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	11.3
Censored		Lognormal mean	9.9
Detection limit or PQL		Std. devn.	23.2
Method detection limit		Median	5.0
TOTAL	12	Min.	0.80
		Max.	84.2

Lognormal distribution?	Normal distribution?
r-squared is: 0.910	r-squared is: 0.416

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 35.3

Dimethyl phthalate 95% UCL Calculation

DATA	ID
145	J1N015/J1N018
190	J1N006
170	J1N007
210	J1N008
240	J1N009
220	J1N010
120	J1N011
120	J1N012
200	J1N013
180	J1N014
160	J1N016
150	J1N017

Number of samples		Uncensored values	
Uncensored	12	Mean	175
Censored		Lognormal mean	176
Detection limit or PQL		Std. devn.	38
Method detection limit		Median	175
TOTAL	12	Min.	120
		Max.	240

Lognormal distribution?	Normal distribution?
r-squared is: 0.972	r-squared is: 0.983

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 200

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

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Checked I. B. Berezovskiy

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Date 04/03/12
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Ecology Software (MTCAStat) Results, 100-D-8 Waste Site Staging Pile Area

Arsenic 95% UCL Calculation

DATA	ID
2.9	J1N3V9/J1N3W6
3.0	J1NLP4
2.9	J1N3V5
3.0	J1NLP5
2.9	J1N3V7
3.1	J1N3V8
3.4	J1N3W0
2.8	J1N3W1
3.2	J1N3W2
3.0	J1N3W3
1.8	J1N3W4
2.0	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 2.83
Lognormal mean 2.84
Std. devn. 0.47
Median 2.95
Min. 1.8
Max. 3.4

Lognormal distribution? Normal distribution?
r-squared is: 0.726 r-squared is: 0.779
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 3.1

Barium 95% UCL Calculation

DATA	ID
71.3	J1N3V9/J1N3W6
76.0	J1NLP4
88.6	J1N3V5
78.3	J1NLP5
73.7	J1N3V7
102	J1N3V8
84.4	J1N3W0
67.3	J1N3W1
85.6	J1N3W2
78.6	J1N3W3
53.1	J1N3W4
50.1	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 75.8
Lognormal mean 75.9
Std. devn. 14.5
Median 77.2
Min. 50.1
Max. 102

Lognormal distribution? Normal distribution?
r-squared is: 0.926 r-squared is: 0.958
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 85.0

Beryllium 95% UCL Calculation

DATA	ID
0.45	J1N3V9/J1N3W6
0.54	J1NLP4
0.57	J1N3V5
0.53	J1NLP5
0.48	J1N3V7
0.45	J1N3V8
0.49	J1N3W0
0.47	J1N3W1
0.50	J1N3W2
0.48	J1N3W3
0.44	J1N3W4
0.44	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 0.49
Lognormal mean 0.49
Std. devn. 0.042
Median 0.48
Min. 0.44
Max. 0.57

Lognormal distribution? Normal distribution?
r-squared is: 0.938 r-squared is: 0.928
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.51

Boron 95% UCL Calculation

DATA	ID
0.53	J1N3V9/J1N3W6
1.9	J1NLP4
1.2	J1N3V5
1.5	J1NLP5
0.92	J1N3V7
1.5	J1N3V8
1.1	J1N3W0
0.50	J1N3W1
1.4	J1N3W2
0.48	J1N3W3
0.45	J1N3W4
0.50	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.0
Lognormal mean 1.0
Std. devn. 0.51
Median 1.0
Min. 0.45
Max. 1.9

Lognormal distribution? Normal distribution?
r-squared is: 0.883 r-squared is: 0.900
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 1.3

Cadmium 95% UCL Calculation

DATA	ID
0.062	J1N3V9/J1N3W6
0.080	J1NLP4
0.056	J1N3V5
0.053	J1NLP5
0.096	J1N3V7
0.11	J1N3V8
0.073	J1N3W0
0.046	J1N3W1
0.075	J1N3W2
0.040	J1N3W3
0.019	J1N3W4
0.070	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 0.065
Lognormal mean 0.067
Std. devn. 0.025
Median 0.066
Min. 0.019
Max. 0.11

Lognormal distribution? Normal distribution?
r-squared is: 0.895 r-squared is: 0.985
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 0.078

Chromium 95% UCL Calculation

DATA	ID
8.1	J1N3V9/J1N3W6
9.3	J1NLP4
9.9	J1N3V5
9.4	J1NLP5
8.5	J1N3V7
9.6	J1N3V8
9.7	J1N3W0
8.4	J1N3W1
11.0	J1N3W2
5.4	J1N3W3
4.0	J1N3W4
3.2	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 7.9
Lognormal mean 8.0
Std. devn. 2.5
Median 8.9
Min. 3.2
Max. 11.0

Lognormal distribution? Normal distribution?
r-squared is: 0.834 r-squared is: 0.898
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 9.1

Cobalt 95% UCL Calculation

DATA	ID
7.7	J1N3V9/J1N3W6
7.3	J1NLP4
9.0	J1N3V5
7.4	J1NLP5
8.4	J1N3V7
6.4	J1N3V8
8.3	J1N3W0
8.0	J1N3W1
8.0	J1N3W2
8.1	J1N3W3
8.3	J1N3W4
7.5	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 7.9
Lognormal mean 7.9
Std. devn. 0.67
Median 8.0
Min. 6.4
Max. 9.0

Lognormal distribution? Normal distribution?
r-squared is: 0.923 r-squared is: 0.943
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 8.2

Copper 95% UCL Calculation

DATA	ID
16.7	J1N3V9/J1N3W6
15.1	J1NLP4
17.5	J1N3V5
16.1	J1NLP5
15.2	J1N3V7
14.6	J1N3V8
15.5	J1N3W0
14.5	J1N3W1
15.2	J1N3W2
15.0	J1N3W3
14.9	J1N3W4
16.9	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 15.6
Lognormal mean 15.6
Std. devn. 0.97
Median 15.2
Min. 14.5
Max. 17.5

Lognormal distribution? Normal distribution?
r-squared is: 0.911 r-squared is: 0.901
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 16.1

Lead 95% UCL Calculation

DATA	ID
3.2	J1N3V9/J1N3W6
4.1	J1NLP4
5.5	J1N3V5
3.8	J1NLP5
5.2	J1N3V7
3.9	J1N3V8
5.2	J1N3W0
5.5	J1N3W1
5.5	J1N3W2
4.9	J1N3W3
2.5	J1N3W4
2.8	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 4.3
Lognormal mean 4.4
Std. devn. 1.1
Median 4.5
Min. 2.5
Max. 5.5

Lognormal distribution? Normal distribution?
r-squared is: 0.892 r-squared is: 0.908
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 4.9

CALCULATION SHEET

Washington Closure Hanford
Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

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Checked I. B. Berezovskiy

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Ecology Software (MTCAStat) Results, 100-D-8 Waste Site Staging Pile Area

Manganese 95% UCL Calculation

DATA	ID
298	J1N3V9/J1N3W6
309	J1NLP4
349	J1N3V5
315	J1NLP5
322	J1N3V7
288	J1N3V8
340	J1N3W0
313	J1N3W1
349	J1N3W2
288	J1N3W3
276	J1N3W4
255	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 309
Lognormal mean 309
Std. devn. 29.2
Median 311
Min. 255
Max. 349

Lognormal distribution? Normal distribution?
r-squared is: 0.967 r-squared is: 0.972
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 325

Nickel 95% UCL Calculation

DATA	ID
9.5	J1N3V9/J1N3W6
11.4	J1NLP4
10.7	J1N3V5
10.3	J1NLP5
9.4	J1N3V7
9.8	J1N3V8
11.1	J1N3W0
8.2	J1N3W1
11.5	J1N3W2
7.4	J1N3W3
6.3	J1N3W4
5.6	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 9.3
Lognormal mean 9.3
Std. devn. 2.0
Median 9.7
Min. 5.6
Max. 11.5

Lognormal distribution? Normal distribution?
r-squared is: 0.890 r-squared is: 0.928
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 10.3

Vanadium 95% UCL Calculation

DATA	ID
52.8	J1N3V9/J1N3W6
43.9	J1NLP4
55.2	J1N3V5
42.6	J1NLP5
58.3	J1N3V7
42.5	J1N3V8
55.5	J1N3W0
58.8	J1N3W1
50.5	J1N3W2
62.4	J1N3W3
60.0	J1N3W4
51.0	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 52.8
Lognormal mean 52.8
Std. devn. 6.9
Median 54.0
Min. 42.5
Max. 62.4

Lognormal distribution? Normal distribution?
r-squared is: 0.923 r-squared is: 0.940
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 56.8

Zinc 95% UCL Calculation

DATA	ID
37.3	J1N3V9/J1N3W6
38.2	J1NLP4
42.8	J1N3V5
36.1	J1NLP5
42.9	J1N3V7
37.4	J1N3V8
42.9	J1N3W0
41.4	J1N3W1
42.6	J1N3W2
41.5	J1N3W3
39.5	J1N3W4
98.2	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 45.1
Lognormal mean 44.8
Std. devn. 16.9
Median 41.5
Min. 36.1
Max. 98.2

Lognormal distribution? Normal distribution?
r-squared is: 0.515 r-squared is: 0.430
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 53.1

Nitrogen in Nitrate 95% UCL Calculation

DATA	ID
0.78	J1N3V9/J1N3W6
1.2	J1NLP4
0.76	J1N3V5
0.35	J1NLP5
0.60	J1N3V7
0.17	J1N3V8
0.17	J1N3W0
0.48	J1N3W1
0.18	J1N3W2
0.53	J1N3W3
0.50	J1N3W4
5.1	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 0.90
Lognormal mean 0.84
Std. devn. 1.4
Median 0.52
Min. 0.17
Max. 5.1

Lognormal distribution? Normal distribution?
r-squared is: 0.892 r-squared is: 0.496
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 1.5

Nitrogen in Nitrite and Nitrate 95% UCL Calculation

DATA	ID
0.42	J1N3V9/J1N3W6
1.5	J1NLP4
0.81	J1N3V5
0.17	J1NLP5
0.17	J1N3V7
0.17	J1N3V8
0.17	J1N3W0
0.34	J1N3W1
0.17	J1N3W2
0.39	J1N3W3
0.37	J1N3W4
11.4	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 1.3
Lognormal mean 0.94
Std. devn. 3.2
Median 0.36
Min. 0.17
Max. 11.4

Lognormal distribution? Normal distribution?
r-squared is: 0.761 r-squared is: 0.382
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 2.9

Sulfate 95% UCL Calculation

DATA	ID
11.4	J1N3V9/J1N3W6
3.4	J1NLP4
5.3	J1N3V5
0.95	J1NLP5
2.7	J1N3V7
1.9	J1N3V8
0.90	J1N3W0
3.8	J1N3W1
0.95	J1N3W2
0.90	J1N3W3
0.90	J1N3W4
4.1	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 3.1
Lognormal mean 3.2
Std. devn. 3.0
Median 2.3
Min. 0.90
Max. 11.4

Lognormal distribution? Normal distribution?
r-squared is: 0.891 r-squared is: 0.732
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 4.5

Bis(2-ethylhexyl) phthalate 95% UCL Calculation

DATA	ID
89	J1N3V9/J1N3W6
83	J1NLP4
85	J1N3V5
82	J1NLP5
90	J1N3V7
83	J1N3V8
92	J1N3W0
92	J1N3W1
93	J1N3W2
91	J1N3W3
86	J1N3W4
85	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 88
Lognormal mean 88
Std. devn. 4.0
Median 88
Min. 82
Max. 93

Lognormal distribution? Normal distribution?
r-squared is: 0.926 r-squared is: 0.926
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 90

Dimethyl phthalate 95% UCL Calculation

DATA	ID
147	J1N3V9/J1N3W6
12	J1NLP4
220	J1N3V5
12	J1NLP5
13	J1N3V7
140	J1N3V8
13	J1N3W0
230	J1N3W1
13	J1N3W2
370	J1N3W3
68	J1N3W4
12	J1N3W5

Number of samples
Uncensored 12
Censored
Detection limit or PQL
Method detection limit
TOTAL 12

Uncensored values
Mean 104
Lognormal mean 129
Std. devn. 119
Median 40
Min. 12
Max. 370

Lognormal distribution? Normal distribution?
r-squared is: 0.813 r-squared is: 0.806
Recommendations:
Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is 160

CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern **Date** 04/03/12 **Calc. No.** 0100D-CA-V0451 **Rev. No.** 0
Project 100-D Field Remediation **Job No.** 14655 **Checked** I. B. Berezovskiy **Date** 04/03/12
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 25 of 27

Duplicate Analysis - 100-D-8 Waste Site Excavation

Sampling Area	Sample Number	Sample Date	Thorium-228			Thorium-232			Uranium-234			Aluminum			Antimony			Arsenic			Barium			Cadmium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	0.624	J	0.147	0.455	J	0.119	0.144		0.0908	6570	X	1.4	0.87	J	0.35	3.9		0.62	77.4	X	0.071	0.045	B	0.038
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.301	J	0.130	0.231	J	0.112	0.885		0.101	6390	X	1.5	0.96	J	0.38	4.7		0.65	86.8	X	0.075	0.063	B	0.041

Analysis:

TDL		1	1	1	5	0.6	10	2	2
Duplicate Analysis	Both > PQL?	**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)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD				2.8%			11.4%	
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate Analysis - 100-D-8 Waste Site Excavation

Sampling Area	HEIS Number	Sample Date	Calcium			Chromium			Cobalt			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	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	2470	X	13.2	10.4	X	0.054	5.0	X	0.093	14.7		0.20	14300	X	3.5	4.0		0.25	3200	X	3.5	240	X	0.093
Duplicate of J1MXX1	J1MXX4	12/12/2011	2660	X	13.9	11.5	X	0.057	5.5	X	0.099	14.7		0.21	16400	X	3.8	4.5		0.27	3300	X	3.7	238	X	0.099

Analysis:

TDL		100	1	2	1	5	5	75	5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD	7.4%	10.0%		0.0%	13.7%		3.1%	0.8%
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 100-D-8 Waste Site Excavation

Sampling Area	HEIS Number	Sample Date	Mercury			Nickel			Potassium			Silicon			Sodium			Vanadium			Zinc			Nitrogen in Nitrate		
			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
A-10	J1MXX1	12/12/2011	0.012	BN	0.0057	12.9	X	0.11	759		38.3	139	J	5.3	165		55.1	32.2	X	0.088	29.3	X	0.37	0.82	BJ	0.30
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.015	BN	0.0055	13.5	X	0.12	652		40.6	141	J	5.6	140		58.4	31.3	X	0.093	29.1	X	0.39	0.53	BJ	0.32

Analysis:

TDL		0.2	4	400	2	50	2.5	1	0.75
Duplicate Analysis	Both > PQL?	**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)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD				1.4%		2.8%	0.7%	
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 100-D-8 Waste Site Excavation

Sampling Area	HEIS Number	Sample Date	Nitrogen in Nitrite and Nitrate		
			mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	0.81		0.32
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.35	B	0.32

Analysis:

TDL		0.75
Duplicate Analysis	Both > PQL?	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)
	RPD	
	Difference > 2 TDL?	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/03/12
Job No. 14655

Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

Rev. No. 0
Date 04/03/12
Sheet No. 26 of 27

Duplicate Analysis - 100-D-8 Waste Site Overburden

Sampling Area	Sample Number	Sample Date	Thorium-228			Thorium-232			Uranium-238			Aluminum			Antimony			Arsenic			Barium			Calcium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
B-10	J1N015	12/13/2011	0.485		0.186	0.220		0.165	0.338		0.116	4470	X	1.4	1.7		0.34	1.3		0.59	55.0	X	0.068	5780	X	12.7
Duplicate of J1N015	J1N018	12/13/2011	0.302		0.113	0.296		0.127	0.288		0.154	4250	X	1.5	1.7		0.37	1.3		0.64	53.7	X	0.073	5470	X	13.6

Analysis:

TDL		1	1	1	5	0.6	10	2	100
Duplicate Analysis	Both > PQL?	**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)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD				5.0%			2.4%	5.5%
	Difference > 2 TDL?	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate Analysis - 100-D-8 Waste Site Overburden

Sampling Area	HEIS Number	Sample Date	Chromium			Cobalt			Copper			Iron			Lead			Magnesium			Manganese			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
B-10	J1N015	12/13/2011	4.2	X	0.052	10.6		0.45	16.8		0.97	27200	X	3.4	2.9		1.2	4380	X	3.3	321	X	0.090	7.9	X	0.11
Duplicate of J1N015	J1N018	12/13/2011	3.9	X	0.056	10.7		0.48	15.8		1.0	28400	X	3.7	3.1		1.3	4750	X	3.6	326	X	0.096	8.9	X	0.12

Analysis:

TDL		1	2	1	5	5	75	5	4
Duplicate Analysis	Both > PQL?	**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)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD		0.9%	6.1%	4.3%		8.1%	1.5%	
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 100-D-8 Waste Site Overburden

Sampling Area	HEIS Number	Sample Date	Potassium			Silicon			Sodium			Vanadium			Zinc			Chloride			Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate		
			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
B-10	J1N015	12/13/2011	576		36.8	239		5.1	418		53.0	85.7		0.42	44.0	X	0.36	25.6		2.0	2.6		0.31	2.4		0.30
Duplicate of J1N015	J1N018	12/13/2011	590		39.5	257		5.5	387		56.9	89.0		0.45	46.3	X	0.38	33.8		1.9	3.2		0.30	3.0		0.30

Analysis:

TDL		400	2	50	2.5	1	2	0.75	0.75
Duplicate Analysis	Both > PQL?	**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)**	**Yes (calc RPD)**	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
	RPD		7.3%	7.7%	3.8%	5.1%	27.6%		
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable

Duplicate Analysis - 100-D-8 Waste Site Overburden

Sampling Area	HEIS Number	Sample Date	Dimethyl phthalate		
			ug/kg	Q	PQL
B-10	J1N015	12/13/2011	170	JB	23
Duplicate of J1N015	J1N018	12/13/2011	120	JB	22

Analysis:

TDL		660
Duplicate Analysis	Both > PQL?	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)
	RPD	
	Difference > 2 TDL?	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator N. K. Schiffern
Project 100-D Field Remediation
Subject 100-D-8 Waste Site Cleanup Verification 95% UCL Calculations

Date 04/04/12
Job No. 14655

Calc. No. 0100D-CA-V0451
Checked I. B. Berezovskiy

Rev. No. 0
Date 04/04/12
Sheet No. 27 of 27

Duplicate Analysis - 100-D-8 Waste Site Staging Pile Area

Sampling Area	Sample Number	Sample Date	Uranium-234			Uranium-238			Aluminum			Arsenic			Barium			Beryllium			Cadmium			Calcium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
C-6	J1N3V9	2/1/2012	0.187		0.0645	0.184		0.0760	6020	X	1.6	3.2		0.68	78.5	X	0.079	0.44		0.034	0.063	B	0.042	10800	X	14.6
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.188		0.0566	0.172		0.0712	6200	X	1.7	2.6		0.72	64.1	X	0.082	0.45		0.036	0.060	B	0.044	10700	X	15.3

Analysis:

TDL		1	1	5	10	2	0.2	0.2	100
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD			2.9%		20.2%			0.9%
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable

Duplicate Analysis - 100-D-8 Waste Site Staging Pile Area

Sampling Area	HEIS Number	Sample Date	Chromium			Cobalt			Copper			Iron			Lead			Magnesium			Manganese			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
C-6	J1N3V9	2/1/2012	8.6	X	0.060	7.6	X	0.10	16.2		0.22	21600	X	3.9	3.3		0.28	4300	X	3.8	285	X	0.10	9.6	X	0.13
Duplicate of J1N3V9	J1N3W6	2/1/2012	7.6	X	0.063	7.7	X	0.11	17.1		0.24	21600	X	4.1	3.1		0.29	4480	X	4.0	311	X	0.11	9.4	X	0.13

Analysis:

TDL		1	2	1	5	5	75	5	4
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD	12.3%		5.4%	0.0%		4.1%	8.7%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate Analysis - 100-D-8 Waste Site Staging Pile Area

Sampling Area	HEIS Number	Sample Date	Potassium			Silicon			Sodium			Vanadium			Zinc			Nitrogen in Nitrate			Nitrogen in Nitrite and Nitrate			Sulfate		
			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
C-6	J1N3V9	2/1/2012	845		42.4	396	X	5.9	286		61.0	53.2	X	0.097	36.9	X	0.41	0.85	B	0.32	0.50	B	0.33	14.1		1.8
Duplicate of J1N3V9	J1N3W6	2/1/2012	815		44.4	336	X	6.1	312		63.9	52.3	X	0.10	37.7	X	0.43	0.70	B	0.33	0.33	B	0.33	8.7		1.8

Analysis:

TDL		400	2	50	2.5	1	0.75	0.75	5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)		No-Stop (acceptable)
	RPD		16.4%	8.7%	1.7%	2.1%			
	Difference > 2 TDL?	No - acceptable	Not applicable	Not applicable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable

Duplicate Analysis - 100-D-8 Waste Site Staging Pile Area

Sampling Area	HEIS Number	Sample Date	Bis(2-ethylhexyl) phthalate			Dimethyl phthalate		
			ug/kg	Q	PQL	ug/kg	Q	PQL
C-6	J1N3V9	2/1/2012	92	JB	50	200	JB	25
Duplicate of J1N3V9	J1N3W6	2/1/2012	86	JB	47	94	JB	24

Analysis:

TDL		660	660
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)
	RPD		
	Difference > 2 TDL?	No - acceptable	No - acceptable

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Radionuclides

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Carbon-14			Cesium-137 GEA			Cobalt-60 GEA			Europium-152 GEA			Europium-154 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
A-10	J1MXX1	12/12/2011	-0.0819	U	0.127	0.105	UJ	0.456	-0.00345	U	0.0291	-0.0106	U	0.0273	-0.0305	U	0.0776	-0.0321	U	0.101
Duplicate of J1MXX1	J1MXX4	12/12/2011	-0.0615	U	0.111	0.227	UJ	0.457	-0.00388	U	0.0336	0.00624	U	0.0383	0.0551	U	0.0955	0.0416	U	0.134
A-1	J1MXW2	12/12/2011	0.00156	U	0.228	-0.00218	UJ	0.457	-0.00902	U	0.0240	-0.00239	U	0.0279	0.0275	U	0.0643	-0.0194	U	0.0882
A-2	J1MXW3	12/12/2011	-0.0253	U	0.112	0.222	UJ	0.456	-0.000606	U	0.0257	-0.00481	U	0.0265	0.0281	U	0.0728	0.0283	U	0.0878
A-3	J1MXW4	12/12/2011	-0.00173	U	0.0607	0.217	UJ	0.456	0.000115	U	0.0369	0.0172	U	0.0415	-0.00864	U	0.0978	0.00282	U	0.108
A-4	J1MXW5	12/12/2011	0.0216	U	0.242	0.0612	UJ	0.456	-0.00704	U	0.0257	0.00638	U	0.0304	0.00686	U	0.0674	0.0286	U	0.0955
A-5	J1MXW6	12/12/2011	0.00266	U	0.116	0.0365	UJ	0.456	0.00909	U	0.0275	0.00458	U	0.0254	-0.157	U	0.0731	0.0203	U	0.0875
A-6	J1MXW7	12/12/2011	-0.0111	U	0.110	0.247	UJ	0.457	-0.0161	U	0.0309	0.00826	U	0.0372	-0.0598	U	0.0761	0.0198	U	0.131
A-7	J1MXW8	12/12/2011	-0.0278	U	0.0701	0.119	UJ	0.454	0.00916	U	0.0435	-0.0146	U	0.0385	0.00177	U	0.103	-0.00815	U	0.126
A-8	J1MXW9	12/12/2011	0.0289	U	0.138	0.240	UJ	0.454	0.00540	U	0.0221	-0.00211	U	0.0224	-0.0151	U	0.0495	-0.00440	U	0.0745
A-9	J1MXX0	12/12/2011	-0.0482	U	0.117	-0.0268	UJ	0.454	-0.0106	U	0.0265	-0.00267	U	0.0262	0.0620	U	0.0767	-0.0194	U	0.0760
A-11	J1MXX2	12/12/2011	-0.0135	U	0.0991	0.231	UJ	0.456	-0.0000556	U	0.0335	0.00590	U	0.0328	-0.0277	U	0.0777	0.0486	U	0.114
A-12	J1MXX3	12/12/2011	-0.0267	U	0.0620	0.319	UJ	0.457	-0.0112	U	0.0388	-0.00941	U	0.0397	0.0376	U	0.0980	-0.0321	U	0.113
B-10	J1N015	12/13/2011	-0.0257	U	0.222	0.00471	U	0.460	-0.00850	U	0.0249	-0.0175	U	0.0236	0.0111	U	0.0665	-0.00635	U	0.0941
Duplicate of J1N015	J1N018	12/13/2011	-0.0381	U	0.133	0.103	U	0.461	0.00978	U	0.0247	-0.00887	U	0.0216	-0.00555	U	0.0554	-0.0236	U	0.0760
B-1	J1N006	12/13/2011	0.000204	U	0.0969	-0.0683	U	0.460	0.00413	U	0.0357	0.00429	U	0.0331	-0.0288	U	0.0788	0.0196	U	0.107
B-2	J1N007	12/13/2011	-0.0531	U	0.256	-0.0487	U	0.461	-0.00916	U	0.0263	-0.00602	U	0.0281	0.0132	U	0.0724	-0.0720	U	0.0812
B-3	J1N008	12/13/2011	-0.00601	U	0.0611	0.0629	U	0.460	-0.00459	U	0.0391	-0.00645	U	0.0363	0.00865	U	0.0977	-0.0286	U	0.116
B-4	J1N009	12/13/2011	-0.00757	U	0.144	-0.161	U	0.459	0.00690	U	0.0251	-0.000809	U	0.0242	-0.0128	U	0.0508	-0.00145	U	0.0801
B-5	J1N010	12/13/2011	0.0338	U	0.109	0.00976	U	0.459	0.00280	U	0.0383	0.0106	U	0.0404	0.00162	U	0.0910	-0.00186	U	0.119
B-6	J1N011	12/13/2011	-0.0393	U	0.244	0.214	U	0.460	0.00771	U	0.0273	-0.00164	U	0.0306	0.00259	U	0.0690	-0.00628	U	0.0898
B-7	J1N012	12/13/2011	-0.0132	U	0.0589	0.0733	U	0.461	-0.00403	U	0.0393	0.00426	U	0.0391	0.0257	U	0.0981	0.0260	U	0.117
B-8	J1N013	12/13/2011	-0.0371	U	0.117	0.336	U	0.460	0.00534	U	0.0289	-0.00202	U	0.0267	-0.00963	U	0.0768	-0.0613	U	0.0765
B-9	J1N014	12/13/2011	0.0772	U	0.188	-0.113	U	0.461	0.138		0.0280	0.00295	U	0.0320	-0.00837	U	0.0645	0.0315	U	0.101
B-11	J1N016	12/13/2011	-0.0320	U	0.0959	-0.0392	U	0.458	0.000320	U	0.0345	-0.00792	U	0.0343	-0.0244	U	0.0825	-0.0385	U	0.107
B-12	J1N017	12/13/2011	0.0288	U	0.0581	0.140	U	0.459	0.0147	U	0.0375	0.00336	U	0.0322	-0.0143	U	0.0924	0.00144	U	0.0963
C-6	J1N3V9	2/1/2012	-0.00280	U	0.0249	0.0902	U	0.456	0.00768	U	0.0210	-0.00339	U	0.0222	0.0101	U	0.0431	-0.0190	U	0.0785
Duplicate of J1N3V9	J1N3W6	2/1/2012	-0.00679	U	0.0381	0.192	U	0.457	-0.00449	U	0.0228	-0.000299	U	0.0250	-0.000119	U	0.0581	0.0186	U	0.0793
C-1	J1N3V4	2/1/2012	0.0254	U	0.0282	0.124	U	0.455	0.0616		0.0221	-0.00347	U	0.0254	-0.00496	U	0.0458	0.0107	U	0.0277
C-1 resample[a]	J1NLP4	3/12/2012	-0.0332	U	0.256	-0.104	U	0.465	0.0433	U	0.0262	-0.000290	U	0.00846	0.00450	U	0.0412	-0.00998	U	0.0454
C-2	J1N3V5	2/1/2012	0.000839	U	0.118	-0.146	U	0.456	-0.00543	U	0.0330	-0.00499	U	0.0324	0.00942	U	0.0895	-0.0256	U	0.114
C-3	J1N3V6	2/1/2012	-0.109	U	0.0849	0.211	U	0.455	0.0567	U	0.0499	0.0297	U	0.0455	0.0671	U	0.116	0.0359	U	0.135
C-3 resample[a]	J1NLP5	3/12/2012	-0.00199	U	0.129	0.111	U	0.463	0.00397	U	0.0273	-0.0120	U	0.0256	0.0154	U	0.0805	-0.0279	U	0.0855
C-4	J1N3V7	2/1/2012	-0.0692	U	0.0754	0.0863	U	0.455	0.00273	U	0.0369	-0.0132	U	0.0324	-0.0366	U	0.0955	-0.0414	U	0.103
C-5	J1N3V8	2/1/2012	-0.0100	U	0.0421	0.284	U	0.456	-0.00964	U	0.0281	-0.00233	U	0.0289	0.0321	U	0.0685	-0.0197	U	0.0914
C-7	J1N3W0	2/1/2012	-0.0131	U	0.0666	-0.0211	U	0.456	-0.00303	U	0.0360	0.0124	U	0.0387	0.0223	U	0.0956	-0.0271	U	0.107
C-8	J1N3W1	2/1/2012	0.0186	U	0.107	0.00308	U	0.457	0.0156	U	0.0360	0.00257	U	0.0318	-0.00211	U	0.0847	0.0249	U	0.116
C-9	J1N3W2	2/1/2012	-0.0000620	U	0.152	0.120	U	0.459	0.0208	U	0.0329	0.00564	U	0.0297	0.00916	U	0.0894	0.00910	U	0.0976
C-10	J1N3W3	2/1/2012	0.0812	U	0.220	-0.0750	U	0.458	0.00789	U	0.0239	0.0118	U	0.0273	-0.00870	U	0.0551	-0.0382	U	0.0745
C-11	J1N3W4	2/1/2012	0.0100	U	0.0223	0.207	U	0.456	0.0156	U	0.0192	0.00876	U	0.0251	-0.0134	U	0.0398	0.0274	U	0.0717
C-12	J1N3W5	2/1/2012	-0.0663	U	0.0668	0.0327	U	0.458	0.0361	U	0.0397	0.00325	U	0.0315	0.0135	U	0.0865	-0.00187	U	0.0981

[a] Due to RAG exceedances and further excavation, resamples were taken.

Grey cells indicate not applicable or data will not be used.

Acronyms and notes apply to all of the tables in this attachment.

None: Data qualified with B, C, J and/or X are considered acceptable values.

AEA = Alpha Spectroscopy

B = blank contamination (inorganic constituents)

C = detected in both the sample and the associated quality control blank, and the sample concentration was </=5X the blank concentration.

D = reported from a dilution

GEA = Gamma Spectroscopy

HEIS = Hanford Environmental Information System

J = estimate

M = sample duplicate precision not met.

N= recovery exceeds upper or lower control limits.

PAH = polycyclic aromatice hydrocarbon

PQL = practical quantitation limit

Q = qualifier

R = detected, but due to a major QA deficiency, the data is unusable.

RAG = remedial action goal

SVOA = semivolatile organic compounds

U = undetected

X (metals) = Serial dilution in the analytical batch indicates that physical and chemical interferences are present.

X (SVOAs) = MS, MSD: recovery exceeds upper or lower control limits.

Y = more than 40 % difference between columns, higher result reported.

Attachment	1	Sheet No.	1 of 33
Originator	N. K. Schiffern	Date	04/04/12
Checked	I. B. Berezovskiy	Date	04/04/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Radionuclides

Sample Location	HEIS Number	Sample Date	Europium-155 GEA			Nickel-63			Plutonium-238 AEA			Plutonium-239/240 AEA			Technetium-99			Thorium-228 AEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
A-10	J1MXX1	12/12/2011	0.0463	U	0.0985	-5.11	U	13.3	0	UJ	0.126	0	U	0.126	0.420	U	0.582	0.624	J	0.147
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.0330	U	0.0853	-0.608	U	12.9	0	UJ	0.135	0	U	0.135	0.499	U	0.590	0.301	J	0.130
A-1	J1MXW2	12/12/2011	0.00199	U	0.0701	-3.11	U	13.6	-0.00708	UJ	0.142	0	U	0.106	0.287	U	0.587	0.353	J	0.149
A-2	J1MXW3	12/12/2011	-0.0665	U	0.0818	0.444	U	13.1	0	UJ	0.137	-0.00365	U	0.153	0.407	U	0.590	0.449	J	0.134
A-3	J1MXW4	12/12/2011	-0.0300	U	0.0874	2.68	U	13.1	-0.00739	UJ	0.149	-0.00739	U	0.149	0.489	U	0.581	0.337	J	0.159
A-4	J1MXW5	12/12/2011	0.0262	U	0.0764	-0.935	U	13.0	-0.00163	UJ	0.122	-0.00325	U	0.136	0.334	U	0.588	0.556	J	0.233
A-5	J1MXW6	12/12/2011	0.00509	U	0.0861	0.919	U	17.7	-0.00280	UJ	0.117	-0.00140	U	0.105	0.263	U	0.591	0.430	J	0.230
A-6	J1MXW7	12/12/2011	0.0316	U	0.0843	-2.30	U	14.0	0	UJ	0.133	-0.00355	U	0.148	0.183	U	0.584	0.167	UJ	0.179
A-7	J1MXW8	12/12/2011	0.0367	U	0.0997	-1.11	U	13.7	0	UJ	0.146	-0.00195	U	0.146	0.715		0.581	0.229	J	0.139
A-8	J1MXW9	12/12/2011	0.0277	U	0.0585	-2.56	U	14.1	0	UJ	0.125	-0.00166	U	0.125	0.402	U	0.590	0.353	J	0.149
A-9	J1MXX0	12/12/2011	0.0139	U	0.0908	-2.76	U	13.5	0	UJ	0.131	0	U	0.131	0.429	U	0.585	0.331	J	0.111
A-11	J1MXX2	12/12/2011	0.00427	U	0.0766	0.500	U	13.4	0	UJ	0.121	-0.00161	U	0.120	0.406	U	0.587	0.378	J	0.148
A-12	J1MXX3	12/12/2011	0.0149	U	0.0921	1.91	U	13.4	-0.00181	UJ	0.135	-0.00181	U	0.135	0.507	U	0.583	0.491	J	0.148
B-10	J1N015	12/13/2011	0.0542	U	0.0791	3.87	U	12.4	0	U	0.177	0	U	0.177	0.217	U	0.628	0.485		0.186
Duplicate of J1N015	J1N018	12/13/2011	0.0361	U	0.0633	0.588	U	13.9	0	U	0.135	0	U	0.135	0.372	U	0.629	0.302		0.113
B-1	J1N006	12/13/2011	-0.00373	U	0.0766	2.56	U	12.6	0.0678	U	0.130	-0.00174	U	0.130	0.103	U	0.631	0.255		0.155
B-2	J1N007	12/13/2011	0.0546	U	0.0864	3.00	U	12.9	-0.00696	U	0.140	-0.00696	U	0.140	0.290	U	0.621	0.389		0.119
B-3	J1N008	12/13/2011	-0.00352	U	0.0882	20.8		12.6	-0.00217	U	0.162	-0.00433	U	0.181	0.0896	U	0.636	0.238		0.124
B-4	J1N009	12/13/2011	0.0219	U	0.0630	2.97	U	12.5	-0.00280	U	0.117	0	U	0.105	0.185	U	0.631	0.535		0.150
B-5	J1N010	12/13/2011	-0.00396	U	0.0848	5.30	U	13.6	0	U	0.136	0.0344	U	0.136	0.184	U	0.628	0.315		0.136
B-6	J1N011	12/13/2011	0.0147	U	0.0830	4.58	U	13.2	0	U	0.142	-0.00189	U	0.142	0.439	U	0.628	0.355		0.168
B-7	J1N012	12/13/2011	0.0141	U	0.0899	6.52	U	13.0	-0.00701	U	0.141	0	U	0.105	0.168	U	0.628	0.235	U	0.251
B-8	J1N013	12/13/2011	-0.0339	U	0.0872	-1.41	U	12.8	0	U	0.107	-0.00143	U	0.107	-0.207	U	0.624	0.437		0.236
B-9	J1N014	12/13/2011	0.0402	U	0.0792	5.03	U	12.8	0	U	0.129	0.0690	U	0.129	0.342	U	0.610	0.488		0.229
B-11	J1N016	12/13/2011	0.00337	U	0.0741	5.37	U	12.9	0	U	0.119	-0.00159	U	0.119	0.369	U	0.627	0.463		0.139
B-12	J1N017	12/13/2011	0.00199	U	0.0853	1.18	U	13.0	-0.00177	U	0.133	-0.00177	U	0.133	0.362	U	0.621	0.172		0.131
C-6	J1N3V9	2/1/2012	0.0224	U	0.0373	2.48	U	8.39	0	U	0.0648	0	U	0.0648	0.0707	U	0.606			
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.00161	U	0.0560	2.68	U	8.89	0.0142	U	0.0593	-0.00568	U	0.0802	-0.271	U	0.604			
C-1	J1N3V4	2/1/2012	0.0608		0.0376	1.63	U	10.3	-0.00297	U	0.0711	-0.00447	U	0.119	-0.0617	U	0.606			
C-1 resample[a]	J1NLP4	3/12/2012	0.0127	U	0.0260	2.70	U	12.5	-0.00158	U	0.0660	0.0158	U	0.0660	0.478	U	0.605			
C-2	J1N3V5	2/1/2012	0.0185	U	0.0874	2.13	U	9.51	-0.00147	U	0.0613	-0.00440	U	0.0770	-0.178	U	0.602			
C-3	J1N3V6	2/1/2012	0.0187	U	0.116	3.53	U	8.61	-0.00244	U	0.102	-0.0292	U	0.190	-0.0790	U	0.626			
C-3 resample[a]	J1NLP5	3/12/2012	-0.00925	U	0.0919	4.53	U	12.9	-0.00157	U	0.0656	-0.00157	U	0.0656	0.146	U	0.612			
C-4	J1N3V7	2/1/2012	0.0343	U	0.104	2.28	U	9.39	-0.00291	U	0.0698	-0.00146	U	0.0609	0.148	U	0.614			
C-5	J1N3V8	2/1/2012	0.0147	U	0.0657	7.63	U	8.41	0	U	0.0744	0	U	0.0744	-0.144	U	0.600			
C-7	J1N3W0	2/1/2012	0.0208	U	0.0951	-0.431	U	9.35	-0.00359	U	0.0860	0	U	0.0750	0.00199	U	0.617			
C-8	J1N3W1	2/1/2012	0.0386	U	0.0824	6.89	U	9.30	0	U	0.0851	-0.00407	U	0.0975	-0.00863	U	0.611			
C-9	J1N3W2	2/1/2012	0.0128	U	0.107	7.30	U	8.89	0	U	0.0691	0	U	0.0691	-0.0458	U	0.609			
C-10	J1N3W3	2/1/2012	-0.00942	U	0.0681	2.58	U	9.32	-0.00387	U	0.0926	0	U	0.0808	-0.207	U	0.612			
C-11	J1N3W4	2/1/2012	0.0494	U	0.0371	1.82	U	8.74	0	U	0.0806	0.0193	U	0.0806	0.137	U	0.611			
C-12	J1N3W5	2/1/2012	0.0710	U	0.0977	0.701	U	8.74	-0.00162	U	0.0676	0	U	0.0676	0.116	U	0.616			

Attachment	1	Sheet No.	2 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Radionuclides

Sample Location	HEIS Number	Sample Date	Thorium-230 AEA			Thorium-232 AEA			Total beta radiostrontium			Tritium			Uranium-234 AEA			Uranium-235 AEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
A-10	J1MXX1	12/12/2011	0.0971	U	0.110	0.455	J	0.119	-0.0301	U	0.186	0.0132	UJ	0.0203	0.144		0.0908	0.0242	UJ	0.0908
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.229		0.133	0.231	J	0.112	0.0765	U	0.181	0.00922	UJ	0.0172	0.885		0.101	0	UJ	0.101
A-1	J1MXW2	12/12/2011	0.104	U	0.132	0.386	J	0.132	0.102	U	0.200	0.0140	UJ	0.0179	0.177		0.139	-0.00531	UJ	0.127
A-2	J1MXW3	12/12/2011	0.203		0.138	0.205	J	0.115	0.0657	U	0.177	0.0268	UJ	0.0279	0.312		0.110	-0.00394	UJ	0.118
A-3	J1MXW4	12/12/2011	0.0834	U	0.156	0.250	J	0.156	0.0842	U	0.159	0.00855	UJ	0.0179	0.272		0.103	0.0273	UJ	0.103
A-4	J1MXW5	12/12/2011	0.0551	U	0.256	0.122	UJ	0.229	-0.0293	U	0.177	0.00894	UJ	0.0168	0.308		0.0966	0	UJ	0.0966
A-5	J1MXW6	12/12/2011	0.242	U	0.227	0.605	J	0.227	0.0669	U	0.179	0.00910	UJ	0.0115	0.234		0.0877	0	UJ	0.0877
A-6	J1MXW7	12/12/2011	0.167	U	0.158	0.253	J	0.158	0.0325	U	0.176	0.00505	UJ	0.0204	0.227		0.0953	-0.00127	UJ	0.0953
A-7	J1MXW8	12/12/2011	0.260		0.122	0.359	J	0.122	0.0455	U	0.176	0.0119	UJ	0.0147	0.196		0.0926	0.0247	UJ	0.0926
A-8	J1MXW9	12/12/2011	0.139	U	0.132	0.455	J	0.132	0.102	U	0.191	0.0115	J	0.0107	0.0788	U	0.114	-0.00109	UJ	0.0989
A-9	J1MXX0	12/12/2011	0.0971	U	0.110	0.422	J	0.119	0.0450	U	0.174	0.0178	J	0.0145	0.0632	U	0.130	0.0179	UJ	0.120
A-11	J1MXX2	12/12/2011	0.132		0.121	0.407	J	0.099	0.0375	U	0.167	0.0117	J	0.00995	0.783		0.113	0.0602	UJ	0.113
A-12	J1MXX3	12/12/2011	0.277		0.130	0.452	J	0.130	0.0330	U	0.184	0.0104	UJ	0.0157	0.214		0.101	0	UJ	0.101
B-10	J1N015	12/13/2011	0.261		0.165	0.220		0.165	0.0227	U	0.163	0.0257	U	0.0346	0.245		0.116	0	U	0.116
Duplicate of J1N015	J1N018	12/13/2011	0.132	U	0.111	0.296		0.127	0.130	U	0.177	0.0188	U	0.0372	0.125	U	0.154	0.0231	U	0.123
B-1	J1N006	12/13/2011	0.144	U	0.137	0.326		0.137	0.0211	U	0.142	0.00192	U	0.0350	0.0974	U	0.153	-0.00542	U	0.130
B-2	J1N007	12/13/2011	0.104	U	0.117	0.486		0.134	0.0846	U	0.158	0.00729	U	0.0404	0.301		0.160	-0.00426	U	0.128
B-3	J1N008	12/13/2011	0.235		0.114	0.235		0.114	-0.0116	U	0.171	-0.000122	U	0.0346	0.135		0.0848	0	U	0.0848
B-4	J1N009	12/13/2011	0.175		0.133	0.390		0.133	0.0358	U	0.173	0.0218	U	0.0367	0.216		0.102	0	U	0.102
B-5	J1N010	12/13/2011	0.136	U	0.140	0.347		0.117	0.0231	U	0.151	-0.0000595	U	0.0382	0.181		0.0848	0	U	0.0848
B-6	J1N011	12/13/2011	0.0881	U	0.165	0.353		0.165	-0.00600	U	0.169	0.0234	U	0.0358	0.0891	U	0.0846	-0.00113	U	0.0846
B-7	J1N012	12/13/2011	0.172	U	0.248	0.294		0.222	0.0318	U	0.161	0.00264	U	0.0317	0.188		0.165	-0.00256	U	0.107
B-8	J1N013	12/13/2011	0.174	U	0.297	0.186	U	0.233	-0.0162	U	0.159	0.0121	U	0.0348	0.225		0.137	-0.00131	U	0.119
B-9	J1N014	12/13/2011	0.301		0.226	0.361		0.226	0.129	U	0.178	0.0343	U	0.0442	0.172		0.0930	0	U	0.0930
B-11	J1N016	12/13/2011	0.294		0.123	0.164		0.123	0.0212	U	0.164	0.0318	U	0.0360	0.244		0.131	0	U	0.131
B-12	J1N017	12/13/2011	0.204		0.129	0.479		0.129	0.0593	U	0.171	0.0321	U	0.0348	0.0708	U	0.0899	0	U	0.0899
C-6	J1N3V9	2/1/2012							0.0319	U	0.156	0.0261	U	0.0342	0.187		0.0645	0	U	0.0563
Duplicate of J1N3V9	J1N3W6	2/1/2012							0.00945	U	0.138	0.00472	U	0.0332	0.188		0.0566	0	U	0.0566
C-1	J1N3W4	2/1/2012							0.0544	U	0.159	0.0239	U	0.0356	0.175		0.0845	0.00616	U	0.0739
C-1 resample[a]	J1NLP4	3/12/2012							0.0316	U	0.157	0.00341	U	0.0438	0.179		0.0499	0	U	0.0499
C-2	J1N3V5	2/1/2012							-0.0169	U	0.177	0.0175	U	0.0361	0.121	U	0.121	-0.00340	U	0.0814
C-3	J1N3V6	2/1/2012							0.0285	U	0.170	0.00216	U	0.0326	0.168		0.0650	0	U	0.0453
C-3 resample[a]	J1NLP5	3/12/2012							-0.0242	U	0.157	0.00157	U	0.0397	0.156		0.0700	-0.00267	U	0.0638
C-4	J1N3V7	2/1/2012							0.0413	U	0.213	0.0310	U	0.0416	0.160		0.0477	0.0103	U	0.0477
C-5	J1N3V8	2/1/2012							0.0539	U	0.155	0.0135	U	0.0342	0.150		0.0521	0	U	0.0455
C-7	J1N3W0	2/1/2012							0.0330	U	0.161	0.0153	U	0.0357	0.275		0.0575	0.0309	U	0.0693
C-8	J1N3W1	2/1/2012							0.0347	U	0.159	0.0510		0.0479	0.118		0.0497	0	U	0.0497
C-9	J1N3W2	2/1/2012							0.0918	U	0.163	0.0152	U	0.0437	0.190		0.0773	0.0275	U	0.0683
C-10	J1N3W3	2/1/2012							0.142	U	0.157	0.202		0.0259	0.0579	U	0.0942	0.00362	U	0.0797
C-11	J1N3W4	2/1/2012							0.107	U	0.150	0.0142	U	0.0249	0.0996		0.0792	-0.00240	U	0.0575
C-12	J1N3W5	2/1/2012							0.133	U	0.156	0.0203		0.0194	0.138		0.0525	-0.00126	U	0.0525

Attachment	1	Sheet No.	3 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Radionuclides

Sample Location	HEIS Number	Sample Date	Uranium-238 AEA		
			pCi/g	Q	MDA
A-10	J1MXX1	12/12/2011	0.0956	U	0.0908
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.698		0.101
A-1	J1MXW2	12/12/2011	0.0795	U	0.0993
A-2	J1MXW3	12/12/2011	0.382		0.148
A-3	J1MXW4	12/12/2011	0.134		0.114
A-4	J1MXW5	12/12/2011	0.205		0.0966
A-5	J1MXW6	12/12/2011	0.372		0.0978
A-6	J1MXW7	12/12/2011	0.328		0.106
A-7	J1MXW8	12/12/2011	0.243		0.111
A-8	J1MXW9	12/12/2011	0.155		0.141
A-9	J1MXX0	12/12/2011	0.358		0.0895
A-11	J1MXX2	12/12/2011	0.602		0.113
A-12	J1MXX3	12/12/2011	0.184		0.121
B-10	J1N015	12/13/2011	0.338		0.116
Duplicate of J1N015	J1N018	12/13/2011	0.288		0.154
B-1	J1N006	12/13/2011	0.108	U	0.101
B-2	J1N007	12/13/2011	0.356		0.165
B-3	J1N008	12/13/2011	0.110		0.102
B-4	J1N009	12/13/2011	0.134		0.102
B-5	J1N010	12/13/2011	0.201		0.0946
B-6	J1N011	12/13/2011	0.178		0.0943
B-7	J1N012	12/13/2011	0.0384	U	0.154
B-8	J1N013	12/13/2011	0.154	U	0.169
B-9	J1N014	12/13/2011	0.122		0.104
B-11	J1N016	12/13/2011	0.137	U	0.147
B-12	J1N017	12/13/2011	0.192		0.0899
C-6	J1N3V9	2/1/2012	0.184		0.0760
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.172		0.0712
C-1	J1N3V4	2/1/2012	0.0665	U	0.0778
C-1 resample[1]	J1NLP4	3/12/2012	0.141		0.0571
C-2	J1N3V5	2/1/2012	0.228		0.107
C-3	J1N3V6	2/1/2012	0.167		0.0684
C-3 resample[1]	J1NLP5	3/12/2012	0.132		0.0557
C-4	J1N3V7	2/1/2012	0.113		0.0477
C-5	J1N3V8	2/1/2012	0.127		0.0572
C-7	J1N3W0	2/1/2012	0.0997		0.0693
C-8	J1N3W1	2/1/2012	0.151		0.0624
C-9	J1N3W2	2/1/2012	0.144		0.0822
C-10	J1N3W3	2/1/2012	0.208		0.0829
C-11	J1N3W4	2/1/2012	0.102		0.0720
C-12	J1N3W5	2/1/2012	0.0866		0.0525

Attachment	1	Sheet No.	4 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Metals

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	6570	X	1.4	0.87	J	0.35	3.9		0.62	77.4	X	0.071	0.031	UJ	0.031	0.92	U	0.92
Duplicate of J1MXX1	J1MXX4	12/12/2011	6390	X	1.5	0.96	J	0.38	4.7		0.65	86.8	X	0.075	0.033	UJ	0.033	0.97	U	0.97
A-1	J1MXW2	12/12/2011	4140	X	1.4	1.5	J	0.35	1.5		0.61	62.1	X	0.071	0.031	UNJ	0.031	0.91	U	0.91
A-2	J1MXW3	12/12/2011	4590	X	1.4	1.2	J	0.34	2.0		0.60	57.7	X	0.069	0.030	UJ	0.030	0.89	U	0.89
A-3	J1MXW4	12/12/2011	4270	X	1.5	1.1	J	0.36	1.5		0.62	51.8	X	0.072	0.031	UJ	0.031	0.92	U	0.92
A-4	J1MXW5	12/12/2011	4000	X	1.5	1.4	J	0.36	1.7		0.63	56.3	X	0.073	0.032	UJ	0.032	0.94	U	0.94
A-5	J1MXW6	12/12/2011	6090	X	1.5	1.2	J	0.37	2.5		0.63	57.7	X	0.073	0.032	UJ	0.032	0.94	U	0.94
A-6	J1MXW7	12/12/2011	4730	X	1.4	0.52	BJ	0.34	1.8		0.59	59.4	X	0.068	0.034	BJ	0.030	0.88	U	0.88
A-7	J1MXW8	12/12/2011	4670	X	1.4	0.88	J	0.35	2.0		0.60	49.3	X	0.070	0.030	UJ	0.030	0.90	U	0.90
A-8	J1MXW9	12/12/2011	5480	X	1.4	1.1	J	0.34	2.8		0.59	61.1	X	0.068	0.029	UJ	0.029	0.87	U	0.87
A-9	J1MXX0	12/12/2011	6150	X	1.5	1.2	J	0.38	2.0		0.66	54.4	X	0.076	0.033	UJ	0.033	0.98	U	0.98
A-11	J1MXX2	12/12/2011	5100	X	1.4	1.5	J	0.34	3.2		0.59	55.9	X	0.068	0.15	UJ	0.15	0.88	U	0.88
A-12	J1MXX3	12/12/2011	5170	X	1.4	1.4	J	0.35	2.0		0.60	60.4	X	0.069	0.030	UJ	0.030	0.89	U	0.89
B-10	J1N015	12/13/2011	4470	X	1.4	1.7		0.34	1.3		0.59	55.0	X	0.068	0.15	U	0.15	0.88	U	0.88
Duplicate of J1N015	J1N018	12/13/2011	4250	X	1.5	1.7		0.37	1.3		0.64	53.7	X	0.073	0.16	U	0.16	0.94	U	0.94
B-1	J1N006	12/13/2011	5070	X	1.5	1.5		0.37	2.0		0.64	58.2	X	0.073	0.16	U	0.16	0.94	U	0.94
B-2	J1N007	12/13/2011	4190	X	1.5	1.6		0.37	1.8		0.65	55.6	X	0.075	0.16	U	0.16	0.97	U	0.97
B-3	J1N008	12/13/2011	5020	X	1.6	1.4		0.39	2.0		0.67	57.4	X	0.077	0.17	U	0.17	0.99	U	0.99
B-4	J1N009	12/13/2011	5170	X	1.5	1.6		0.37	2.1		0.64	59.7	X	0.073	0.16	U	0.16	0.95	U	0.95
B-5	J1N010	12/13/2011	4250	X	2.0	1.7		0.49	1.7		0.86	59.2	X	0.099	0.21	U	0.21	1.3	U	1.3
B-6	J1N011	12/13/2011	4220	X	1.5	1.7		0.36	1.1		0.62	55.7	X	0.071	0.15	U	0.15	0.92	U	0.92
B-7	J1N012	12/13/2011	3810	X	1.4	1.6		0.35	1.6		0.62	50.4	X	0.071	0.15	U	0.15	0.91	U	0.91
B-8	J1N013	12/13/2011	4520	X	1.4	1.7		0.34	1.7		0.60	52.0	X	0.069	0.15	U	0.15	0.88	U	0.88
B-9	J1N014	12/13/2011	9380	X	1.5	1.3		0.38	3.2		0.66	88.9	X	0.076	0.033	U	0.033	2.3		0.98
B-11	J1N016	12/13/2011	4360	X	1.5	1.5		0.36	1.3		0.62	55.5	X	0.071	0.15	U	0.15	0.92	U	0.92
B-12	J1N017	12/13/2011	4250	X	1.5	1.4		0.36	1.5		0.63	47.0	X	0.073	0.16	U	0.16	0.94	U	0.94
C-6	J1N3V9	2/1/2012	6020	X	1.6	0.39	U	0.39	3.2		0.68	78.5	X	0.079	0.44		0.034	1.0	U	1.0
Duplicate of J1N3V9	J1N3W6	2/1/2012	6200	X	1.7	0.41	U	0.41	2.6		0.72	64.1	X	0.082	0.45		0.036	1.1	U	1.1
C-1	J1N3V4	2/1/2012	8320	X	1.7	0.43	B	0.42	2.9		0.73	88.7	X	0.084	0.46		0.037	1.7	B	1.1
C-1 resample[a]	J1NLP4	3/12/2012	7220		1.6	0.41	B	0.38	3.0		0.67	76.0		0.077	0.54		0.033	1.9	B	0.99
C-2	J1N3V5	2/1/2012	9250	X	1.7	0.41	U	0.41	2.9		0.71	88.6	X	0.082	0.57		0.036	1.2	B	1.1
C-3	J1N3V6	2/1/2012	8490	X	1.6	0.40	U	0.40	3.9		0.70	83.7	X	0.080	0.47		0.035	1.2	B	1.0
C-3 resample[a]	J1NLP5	3/12/2012	7010		1.6	0.39	U	0.39	3.0		0.67	78.3		0.078	0.53		0.034	1.5	B	1.0
C-4	J1N3V7	2/1/2012	6800	X	1.5	0.36	U	0.36	2.9		0.62	73.7	X	0.071	0.48		0.031	0.92	B	0.92
C-5	J1N3V8	2/1/2012	7660	X	1.6	0.40	U	0.40	3.1		0.70	102	X	0.081	0.45		0.035	1.5	B	1.0
C-7	J1N3W0	2/1/2012	7650	X	1.6	0.40	U	0.40	3.4		0.70	84.4	X	0.080	0.49		0.035	1.1	B	1.0
C-8	J1N3W1	2/1/2012	6330	X	1.6	0.39	U	0.39	2.8		0.68	67.3	X	0.078	0.47		0.034	1.0	U	1.0
C-9	J1N3W2	2/1/2012	8860	X	1.5	0.38	U	0.38	3.2		0.66	85.6	X	0.076	0.50		0.033	1.4	B	0.98
C-10	J1N3W3	2/1/2012	5040	X	1.5	0.37	U	0.37	3.0		0.65	78.6	X	0.075	0.48		0.032	0.96	U	0.96
C-11	J1N3W4	2/1/2012	4820	X	1.4	0.35	U	0.35	1.8		0.60	53.1	X	0.070	0.44		0.030	0.90	U	0.90
C-12	J1N3W5	2/1/2012	4520	X	1.6	0.40	U	0.40	2.0		0.69	50.1	X	0.079	0.44		0.034	1.0	U	1.0
Equipment Blank	J1N019	12/13/2011	292	X	1.4	0.34	U	0.34	0.59	U	0.59	2.5	X	0.068	0.050	B	0.030	0.88	U	0.88

Attachment	1	Sheet No.	5 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Metals

Sample Location	HEIS Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Hexavalent Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	0.045	B	0.038	2470	X	13.2	10.4	X	0.054	5.0	X	0.093	14.7		0.20	0.155	U	0.155
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.063	B	0.041	2660	X	13.9	11.5	X	0.057	5.5	X	0.099	14.7		0.21	0.155	U	0.155
A-1	J1MXW2	12/12/2011	0.038	U	0.038	6420	X	13.1	4.0	X	0.054	7.7	X	0.093	12.9		0.20	0.155	U	0.155
A-2	J1MXW3	12/12/2011	0.037	U	0.037	5090	X	12.8	5.4	X	0.052	7.1	X	0.090	12.6		0.20	0.155	U	0.155
A-3	J1MXW4	12/12/2011	0.039	U	0.039	5230	X	13.3	5.1	X	0.055	6.9	X	0.094	12.1		0.20	0.155	U	0.155
A-4	J1MXW5	12/12/2011	0.039	U	0.039	5280	X	13.5	3.4	X	0.056	8.0	X	0.096	12.7		0.21	0.155	U	0.155
A-5	J1MXW6	12/12/2011	0.039	U	0.039	5970	X	13.6	9.1	X	0.056	7.1	X	0.096	14.1		0.21	0.155	U	0.155
A-6	J1MXW7	12/12/2011	0.041	B	0.037	1530	X	12.7	10.9	X	0.052	3.6	X	0.090	9.5		0.20	0.155	U	0.155
A-7	J1MXW8	12/12/2011	0.038	U	0.038	3130	X	12.9	8.6	X	0.053	4.8	X	0.092	10.1		0.20	0.155	U	0.155
A-8	J1MXW9	12/12/2011	0.036	U	0.036	4900	X	12.5	7.6	X	0.052	6.5	X	0.089	13.3		0.19	0.155	U	0.155
A-9	J1MXX0	12/12/2011	0.041	U	0.041	6130	X	14.0	8.6	X	0.058	7.5	X	0.10	14.8		0.22	0.155	U	0.155
A-11	J1MXX2	12/12/2011	0.037	U	0.037	5740	X	12.6	5.3	X	0.052	9.6	X	0.45	16.4		0.97	0.155	U	0.155
A-12	J1MXX3	12/12/2011	0.037	U	0.037	5570	X	12.8	6.1	X	0.053	7.7	X	0.091	15.8		0.20	0.155	U	0.155
B-10	J1N015	12/13/2011	0.037	U	0.037	5780	X	12.7	4.2	X	0.052	10.6		0.45	16.8		0.97	0.155	U	0.155
Duplicate of J1N015	J1N018	12/13/2011	0.040	U	0.040	5470	X	13.6	3.9	X	0.056	10.7		0.48	15.8		1.0	0.155	U	0.155
B-1	J1N006	12/13/2011	0.039	U	0.039	6350	X	13.6	4.8	X	0.056	9.8		0.48	16.5		1.0	0.155	U	0.155
B-2	J1N007	12/13/2011	0.040	U	0.040	5550	X	13.9	3.9	X	0.057	9.5		0.49	15.0		1.1	0.155	U	0.155
B-3	J1N008	12/13/2011	0.042	U	0.042	5770	X	14.3	5.9	X	0.059	8.9		0.51	14.7		1.1	0.155	U	0.155
B-4	J1N009	12/13/2011	0.040	U	0.040	5920	X	13.6	5.8	X	0.056	9.3		0.48	15.5		1.0	0.155	U	0.155
B-5	J1N010	12/13/2011	0.053	U	0.053	5430	X	18.3	3.8	X	0.075	17.2		0.65	13.9		1.4	0.155	U	0.155
B-6	J1N011	12/13/2011	0.038	U	0.038	5680	X	13.2	3.9	X	0.054	10.3		0.47	16.1		1.0	0.155	U	0.155
B-7	J1N012	12/13/2011	0.038	U	0.038	5400	X	13.1	4.0	X	0.054	9.3		0.47	14.6		1.0	0.155	U	0.155
B-8	J1N013	12/13/2011	0.037	U	0.037	5550	X	12.7	4.2	X	0.052	9.5		0.45	15.8		0.98	0.155	U	0.155
B-9	J1N014	12/13/2011	0.069	B	0.041	4490	X	14.1	11.3	X	0.058	7.8		0.10	15.1		0.22	0.155	U	0.155
B-11	J1N016	12/13/2011	0.038	U	0.038	5740	X	13.2	3.7	X	0.054	9.9		0.47	15.5		1.0	0.155	U	0.155
B-12	J1N017	12/13/2011	0.039	U	0.039	5340	X	13.5	3.7	X	0.056	9.4		0.48	14.7		1.0	0.155	U	0.155
C-6	J1N3V9	2/1/2012	0.063	B	0.042	10800	X	14.6	8.6	X	0.060	7.6	X	0.10	16.2		0.22	0.155	U	0.155
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.060	B	0.044	10700	X	15.3	7.6	X	0.063	7.7	X	0.11	17.1		0.24	0.155	U	0.155
C-1	J1N3V4	2/1/2012	0.073	B	0.045	4200	X	15.6	13.7	X	0.064	7.5	X	0.11	15.6		0.24	0.155	U	0.155
C-1 resample[a]	J1NLP4	3/12/2012	0.080	B	0.042	8310		14.3	9.3	X	0.059	7.3	X	0.10	15.1		0.22	0.155	U	0.155
C-2	J1N3V5	2/1/2012	0.056	B	0.044	4840	X	15.2	9.9	X	0.062	9.0	X	0.11	17.5		0.23	0.155	U	0.155
C-3	J1N3V6	2/1/2012	0.11	B	0.043	4800	X	14.9	12.2	X	0.061	7.4	X	0.11	16.7		0.23	0.155	U	0.155
C-3 resample[a]	J1NLP5	3/12/2012	0.053	B	0.042	5760		14.4	9.4	X	0.059	7.4	X	0.10	16.1		0.22	0.155	U	0.155
C-4	J1N3V7	2/1/2012	0.096	B	0.039	5970	X	13.3	8.5	X	0.055	8.4	X	0.094	15.2		0.20	0.155	U	0.155
C-5	J1N3V8	2/1/2012	0.11	B	0.043	8210	X	14.9	9.6	X	0.061	6.4	X	0.11	14.6		0.23	0.155	U	0.155
C-7	J1N3W0	2/1/2012	0.073	B	0.043	5270	X	14.9	9.7	X	0.061	8.3	X	0.11	15.5		0.23	0.155	U	0.155
C-8	J1N3W1	2/1/2012	0.046	B	0.042	6080	X	14.5	6.4	X	0.060	8.0	X	0.10	14.5		0.22	0.155	U	0.155
C-9	J1N3W2	2/1/2012	0.075	B	0.041	4920	X	14.1	11.0	X	0.058	8.0	X	0.10	15.2		0.22	0.213		0.155
C-10	J1N3W3	2/1/2012	0.040	B	0.040	6330	X	13.8	5.4	X	0.057	8.1	X	0.098	15.0		0.21	0.155	U	0.155
C-11	J1N3W4	2/1/2012	0.038	U	0.038	5980	X	12.9	4.0	X	0.053	8.3	X	0.092	14.9		0.20	0.155	U	0.155
C-12	J1N3W5	2/1/2012	0.070	B	0.043	5310	X	14.7	3.2	X	0.060	7.5	X	0.10	16.9		0.23	0.155	U	0.155
Equipment Blank	J1N019	12/13/2011	0.037	U	0.037	54.8	X	12.7	0.14	BX	0.052	0.11	B	0.090	0.27	B	0.20			

Attachment	1	Sheet No.	6 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Metals

Sample Location	HEIS Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Molybdenum		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	14300	X	3.5	4.0		0.25	3200	X	3.5	240	X	0.093	0.012	BN	0.0057	0.24	U	0.24
Duplicate of J1MXX1	J1MXX4	12/12/2011	16400	X	3.8	4.5		0.27	3300	X	3.7	238	X	0.099	0.015	BN	0.0055	0.26	U	0.26
A-1	J1MXW2	12/12/2011	23500	X	3.5	2.9		0.25	4020	X	3.4	284	X	0.093	0.0056	UN	0.0056	0.24	U	0.24
A-2	J1MXW3	12/12/2011	21400	X	3.4	3.7		0.24	4060	X	3.3	283	X	0.090	0.0052	UN	0.0052	0.24	U	0.24
A-3	J1MXW4	12/12/2011	19900	X	3.6	3.6		0.25	3750	X	3.5	262	X	0.094	0.0053	UN	0.0053	0.25	U	0.25
A-4	J1MXW5	12/12/2011	23500	X	3.6	4.2		0.26	3870	X	3.5	289	X	0.096	0.0054	UN	0.0054	0.25	U	0.25
A-5	J1MXW6	12/12/2011	20200	X	3.7	3.6		0.26	4530	X	3.6	280	X	0.096	0.0056	UN	0.0056	0.25	U	0.25
A-6	J1MXW7	12/12/2011	7340	X	3.4	2.2		0.24	2680	X	3.3	235	X	0.090	0.011	BN	0.0057	0.23	U	0.23
A-7	J1MXW8	12/12/2011	12500	X	3.5	4.0		0.25	3100	X	3.4	236	X	0.092	0.0080	BN	0.0056	0.24	U	0.24
A-8	J1MXW9	12/12/2011	19600	X	3.4	3.3		0.24	4120	X	3.3	251	X	0.089	0.0093	BN	0.0053	0.23	U	0.23
A-9	J1MXX0	12/12/2011	21100	X	3.8	3.5		0.27	4510	X	3.7	301	X	0.10	0.0056	UN	0.0056	0.26	U	0.26
A-11	J1MXX2	12/12/2011	26200	X	3.4	7.1		1.2	4600	X	3.3	327	X	0.090	0.0055	UN	0.0055	0.23	U	0.23
A-12	J1MXX3	12/12/2011	22000	X	3.5	3.8		0.25	4190	X	3.4	288	X	0.091	0.0056	UN	0.0056	0.24	U	0.24
B-10	J1N015	12/13/2011	27200	X	3.4	2.9		1.2	4380	X	3.3	321	X	0.090	0.0051	U	0.0051	0.23	U	0.23
Duplicate of J1N015	J1N018	12/13/2011	28400	X	3.7	3.1		1.3	4750	X	3.6	326	X	0.096	0.0051	U	0.0051	0.25	U	0.25
B-1	J1N006	12/13/2011	27000	X	3.7	5.4		1.3	4650	X	3.6	333	X	0.096	0.0049	UN	0.0049	0.26	B	0.25
B-2	J1N007	12/13/2011	25500	X	3.7	3.1		1.3	4210	X	3.6	305	X	0.098	0.0050	U	0.0050	0.26	U	0.26
B-3	J1N008	12/13/2011	24900	X	3.9	5.3		1.4	4360	X	3.8	313	X	0.10	0.0057	U	0.0057	0.26	U	0.26
B-4	J1N009	12/13/2011	25900	X	3.7	5.4		1.3	4570	X	3.6	316	X	0.097	0.0056	U	0.0056	0.25	U	0.25
B-5	J1N010	12/13/2011	26300	X	4.9	1.7	U	1.7	4350	X	4.8	328	X	0.13	0.0064	U	0.0064	0.34	U	0.34
B-6	J1N011	12/13/2011	27000	X	3.6	2.5		1.3	4540	X	3.5	332	X	0.094	0.0055	U	0.0055	0.24	U	0.24
B-7	J1N012	12/13/2011	25500	X	3.5	2.8		1.3	4350	X	3.5	295	X	0.093	0.0054	U	0.0054	0.24	U	0.24
B-8	J1N013	12/13/2011	26900	X	3.4	3.2		1.2	4410	X	3.3	331	X	0.090	0.0051	U	0.0051	0.23	U	0.23
B-9	J1N014	12/13/2011	23400	X	3.8	5.0		0.27	4860	X	3.7	381	X	0.10	0.0071	B	0.0054	0.26	U	0.26
B-11	J1N016	12/13/2011	27300	X	3.6	2.9		1.3	4440	X	3.5	327	X	0.094	0.0056	U	0.0056	0.24	U	0.24
B-12	J1N017	12/13/2011	26000	X	3.6	2.3	B	1.3	4410	X	3.5	303	X	0.096	0.0050	U	0.0050	0.25	U	0.25
C-6	J1N3V9	2/1/2012	21600	X	3.9	3.3		0.28	4300	X	3.8	285	X	0.10	0.0061	U	0.0061	0.27	U	0.27
Duplicate of J1N3V9	J1N3W6	2/1/2012	21600	X	4.1	3.1		0.29	4480	X	4.0	311	X	0.11	0.064		0.0053	0.28	U	0.28
C-1	J1N3V4	2/1/2012	21600	X	4.2	9.4	M	0.30	4090	X	4.1	347	X	0.11	0.0075	UN	0.0075	0.34	B	0.29
C-1 resample[a]	J1NLP4	3/12/2012	19600		3.8	4.1		0.27	4560	X	3.7	309	X	0.10	0.0064	U	0.0064	0.26	U	0.26
C-2	J1N3V5	2/1/2012	24700	X	4.1	5.5		0.29	4450	X	4.0	349	X	0.11	0.0063	U	0.0063	0.28	U	0.28
C-3	J1N3V6	2/1/2012	20500	X	4.0	6.7		0.29	4450	X	3.9	319	X	0.11	0.0077	B	0.0055	0.28	U	0.28
C-3 resample[a]	J1NLP5	3/12/2012	19300		3.9	3.8		0.28	4540	X	3.8	315	X	0.10	0.0053	U	0.0053	0.27	U	0.27
C-4	J1N3V7	2/1/2012	23700	X	3.6	5.2		0.25	4230	X	3.5	322	X	0.094	0.0065	U	0.0065	0.24	U	0.24
C-5	J1N3V8	2/1/2012	18300	X	4.0	3.9		0.29	4200	X	3.9	288	X	0.11	0.0068	U	0.0068	0.28	U	0.28
C-7	J1N3W0	2/1/2012	22800	X	4.0	5.2		0.29	4210	X	3.9	340	X	0.11	0.0059	U	0.0059	0.27	U	0.27
C-8	J1N3W1	2/1/2012	23000	X	3.9	5.5		0.28	4000	X	3.8	313	X	0.10	0.0060	U	0.0060	0.27	U	0.27
C-9	J1N3W2	2/1/2012	22400	X	3.8	5.5		0.27	4450	X	3.7	349	X	0.10	0.0055	U	0.0055	0.26	U	0.26
C-10	J1N3W3	2/1/2012	23200	X	3.7	4.9		0.26	3780	X	3.6	288	X	0.098	0.0057	U	0.0057	0.26	U	0.26
C-11	J1N3W4	2/1/2012	23100	X	3.5	2.5		0.25	3640	X	3.4	276	X	0.092	0.0052	U	0.0052	0.24	U	0.24
C-12	J1N3W5	2/1/2012	21000	X	4.0	2.8		0.28	3200	X	3.9	255	X	0.10	0.0053	U	0.0053	0.27	U	0.27
Equipment Blank	J1N019	12/13/2011	698	X	3.4	0.56		0.24	30.5	X	3.3	7.2	X	0.090	0.0050	U	0.0050	0.23	U	0.23

Attachment	1	Sheet No.	7 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Metals

Sample Location	HEIS Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	12.9	X	0.11	759		38.3	0.80	U	0.80	139	J	5.3	0.15	U	0.15	165		55.1
Duplicate of J1MXX1	J1MXX4	12/12/2011	13.5	X	0.12	652		40.6	0.85	U	0.85	141	J	5.6	0.16	U	0.16	140		58.4
A-1	J1MXW2	12/12/2011	7.0	XM	0.11	534		38.2	0.80	U	0.80	193	J	5.3	0.15	U	0.15	323		54.9
A-2	J1MXW3	12/12/2011	9.4	X	0.11	617		37.1	0.78	U	0.78	194	J	5.1	0.14	U	0.14	288		53.4
A-3	J1MXW4	12/12/2011	7.9	X	0.12	629		38.6	0.81	U	0.81	236	J	5.3	0.15	U	0.15	286		55.6
A-4	J1MXW5	12/12/2011	6.6	X	0.12	567		39.3	0.82	U	0.82	175	J	5.4	0.15	U	0.15	310		56.5
A-5	J1MXW6	12/12/2011	11.3	X	0.12	910		39.4	0.83	U	0.83	231	J	5.4	0.15	U	0.15	292		56.7
A-6	J1MXW7	12/12/2011	14.9	X	0.11	527		36.9	0.77	U	0.77	90.9	J	5.1	0.14	U	0.14	98.7	B	53.1
A-7	J1MXW8	12/12/2011	12.1	X	0.11	638		37.6	0.79	U	0.79	158	J	5.2	0.15	U	0.15	188		54.1
A-8	J1MXW9	12/12/2011	10.3	X	0.11	773		36.4	0.76	U	0.76	165	J	5.0	0.14	U	0.14	278		52.4
A-9	J1MXX0	12/12/2011	11.7	X	0.12	856		40.8	0.86	U	0.86	259	J	5.6	0.16	U	0.16	323		58.8
A-11	J1MXX2	12/12/2011	8.5	X	0.11	751		36.7	0.77	U	0.77	131	J	5.1	0.14	U	0.14	360		52.9
A-12	J1MXX3	12/12/2011	9.7	X	0.11	685		37.3	0.78	U	0.78	216	J	5.2	0.15	U	0.15	290		53.7
B-10	J1N015	12/13/2011	7.9	X	0.11	576		36.8	0.77	U	0.77	239		5.1	0.14	U	0.14	418		53.0
Duplicate of J1N015	J1N018	12/13/2011	8.9	X	0.12	590		39.5	0.83	U	0.83	257		5.5	0.15	U	0.15	387		56.9
B-1	J1N006	12/13/2011	8.2	X	0.12	747		39.5	0.83	U	0.83	270	N	5.4	0.15	U	0.15	345		56.8
B-2	J1N007	12/13/2011	7.9	X	0.12	560		40.4	0.85	U	0.85	192		5.6	0.16	U	0.16	325		58.1
B-3	J1N008	12/13/2011	8.5	X	0.12	788		41.6	0.87	U	0.87	368		5.7	0.16	U	0.16	332		59.9
B-4	J1N009	12/13/2011	9.0	X	0.12	764		39.6	0.83	U	0.83	280		5.5	0.15	U	0.15	326		57.0
B-5	J1N010	12/13/2011	9.8	X	0.16	523		53.1	1.1	U	1.1	199		7.3	0.21	U	0.21	303		76.5
B-6	J1N011	12/13/2011	8.5	X	0.12	531		38.4	0.81	U	0.81	184		5.3	0.15	U	0.15	338		55.3
B-7	J1N012	12/13/2011	8.3	X	0.11	448		38.2	0.80	U	0.80	190		5.3	0.15	U	0.15	310		55.0
B-8	J1N013	12/13/2011	8.3	X	0.11	494		37.0	0.78	U	0.78	217		5.1	0.14	U	0.14	342		53.3
B-9	J1N014	12/13/2011	11.6	X	0.12	2310		40.9	0.86	U	0.86	469		5.6	0.16	U	0.16	300		58.9
B-11	J1N016	12/13/2011	7.7	X	0.12	570		38.4	0.81	U	0.81	267		5.3	0.15	U	0.15	361		55.3
B-12	J1N017	12/13/2011	9.2	X	0.12	505		39.2	0.82	U	0.82	264		5.4	0.15	U	0.15	329		56.5
C-6	J1N3V9	2/1/2012	9.6	X	0.13	845		42.4	0.89	U	0.89	396	X	5.9	0.17	U	0.17	286		61.0
Duplicate of J1N3V9	J1N3W6	2/1/2012	9.4	X	0.13	815		44.4	0.93	U	0.93	336	X	6.1	0.17	U	0.17	312		63.9
C-1	J1N3V4	2/1/2012	10.7	X	0.14	1870		45.4	0.95	U	0.95	397	X	6.3	0.18	U	0.18	217		65.3
C-1 resample[a]	J1NLP4	3/12/2012	11.4	X	0.12	1500		41.5	0.87	U	0.87	673	XN	5.7	0.16	U	0.16	236		59.7
C-2	J1N3V5	2/1/2012	10.7	X	0.13	1760		44.2	0.93	U	0.93	399	X	6.1	0.17	U	0.17	236		63.5
C-3	J1N3V6	2/1/2012	11.7	X	0.13	1530		43.4	0.91	U	0.91	491	X	6.0	0.17	U	0.17	201		62.5
C-3 resample[a]	J1NLP5	3/12/2012	10.3	X	0.13	1320		41.8	0.88	U	0.88	820	X	5.8	0.16	U	0.16	184		60.2
C-4	J1N3V7	2/1/2012	9.4	X	0.12	1360		38.6	0.81	U	0.81	340	X	5.3	0.15	U	0.15	275		55.5
C-5	J1N3V8	2/1/2012	9.8	X	0.13	1300		43.5	0.91	U	0.91	508	X	6.0	0.17	U	0.17	223		62.5
C-7	J1N3W0	2/1/2012	11.1	X	0.13	1510		43.3	0.91	U	0.91	347	X	6.0	0.17	U	0.17	256		62.4
C-8	J1N3W1	2/1/2012	8.2	X	0.13	1100		42.2	0.89	U	0.89	439	X	5.8	0.16	U	0.16	284		60.7
C-9	J1N3W2	2/1/2012	11.5	X	0.12	1830		40.9	0.86	U	0.86	373	X	5.6	0.16	U	0.16	244		58.9
C-10	J1N3W3	2/1/2012	7.4	X	0.12	1050		40.2	0.84	U	0.84	286	X	5.6	0.16	U	0.16	256		57.9
C-11	J1N3W4	2/1/2012	6.3	X	0.11	747		37.5	0.79	U	0.79	271	X	5.2	0.15	U	0.15	327		54.0
C-12	J1N3W5	2/1/2012	5.6	X	0.13	847		42.7	0.90	U	0.90	268	X	5.9	0.17	U	0.17	271		61.4
Equipment Blank	J1N019	12/13/2011	0.13	BX	0.11	58.3	B	36.9	0.77	U	0.77	139		5.1	0.14	U	0.14	53.2	U	53.2

Attachment	1	Sheet No.	8 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results - Metals and Physical

Sample Location	HEIS Number	Sample Date	Vanadium			Zinc			Percent Moisture			pH		
			mg/kg	Q	PQL	mg/kg	Q	PQL	%	Q	PQL	pH unit	Q	PQL
A-10	J1MXX1	12/12/2011	32.2	X	0.088	29.3	X	0.37	4.4		0.10			
Duplicate of J1MXX1	J1MXX4	12/12/2011	31.3	X	0.093	29.1	X	0.39	5.5		0.10			
A-1	J1MXW2	12/12/2011	58.0	X	0.088	38.9	X	0.37	2.3		0.10			
A-2	J1MXW3	12/12/2011	50.6	X	0.085	35.9	X	0.36	3.0		0.10			
A-3	J1MXW4	12/12/2011	48.4	X	0.089	33.8	X	0.38	2.6		0.10			
A-4	J1MXW5	12/12/2011	55.1	X	0.090	38.4	X	0.38	2.4		0.10			
A-5	J1MXW6	12/12/2011	46.8	X	0.090	36.7	X	0.38	3.7		0.10			
A-6	J1MXW7	12/12/2011	13.8	X	0.085	16.9	X	0.36	2.6		0.10			
A-7	J1MXW8	12/12/2011	28.8	X	0.086	25.2	X	0.36	2.6		0.10			
A-8	J1MXW9	12/12/2011	48.8	X	0.084	34.5	X	0.35	2.1		0.10			
A-9	J1MXX0	12/12/2011	51.4	X	0.094	37.7	X	0.40	4.4		0.10			
A-11	J1MXX2	12/12/2011	76.8	X	0.42	42.7	X	0.36	2.1		0.10			
A-12	J1MXX3	12/12/2011	52.5	X	0.086	38.6	X	0.36	4.5		0.10			
B-10	J1N015	12/13/2011	85.7		0.42	44.0	X	0.36	2.3		0.10			
Duplicate of J1N015	J1N018	12/13/2011	89.0		0.45	46.3	X	0.38	2.1		0.10			
B-1	J1N006	12/13/2011	82.6		0.45	46.1	X	0.38	2.0		0.10			
B-2	J1N007	12/13/2011	74.5		0.46	42.1	X	0.39	1.4		0.10			
B-3	J1N008	12/13/2011	73.3		0.48	42.6	X	0.40	7.9		0.10			
B-4	J1N009	12/13/2011	77.7		0.45	43.8	X	0.38	2.4		0.10			
B-5	J1N010	12/13/2011	81.5		0.61	44.2	X	0.52	22.9		0.10			
B-6	J1N011	12/13/2011	83.0		0.44	43.6	X	0.37	2.1		0.10			
B-7	J1N012	12/13/2011	78.5		0.44	41.4	X	0.37	1.6		0.10			
B-8	J1N013	12/13/2011	83.3		0.42	44.2	X	0.36	2.0		0.10			
B-9	J1N014	12/13/2011	50.5		0.094	44.4	X	0.40	2.7		0.10			
B-11	J1N016	12/13/2011	85.1		0.44	45.0	X	0.37	2.1		0.10			
B-12	J1N017	12/13/2011	80.0		0.45	42.6	X	0.38	2.3		0.10			
C-6	J1N3V9	2/1/2012	53.2	X	0.097	36.9	X	0.41	8.8		0.10	9.25		0.0100
Duplicate of J1N3V9	J1N3W6	2/1/2012	52.3	X	0.10	37.7	X	0.43	8.6		0.10	9.27		0.0100
C-1	J1N3V4	2/1/2012	46.6	X	0.10	61.3	XN	0.44	9.7		0.10	8.41		0.0100
C-1 resample[a]	J1NLP4	3/12/2012	43.9		0.095	38.2	X	0.40	8.6		0.10			
C-2	J1N3V5	2/1/2012	55.2	X	0.10	42.8	X	0.43	9.9		0.10	8.96		0.0100
C-3	J1N3V6	2/1/2012	47.1	X	0.10	43.1	X	0.42	9.2		0.10	8.99		0.0100
C-3 resample[a]	J1NLP5	3/12/2012	42.6		0.096	36.1	X	0.41	5.8		0.10			
C-4	J1N3V7	2/1/2012	58.3	X	0.088	42.9	X	0.37	9.9		0.10	8.99		0.0100
C-5	J1N3V8	2/1/2012	42.5	X	0.10	37.4	X	0.42	8.4		0.10	9.15		0.0100
C-7	J1N3W0	2/1/2012	55.5	X	0.099	42.9	X	0.42	9.9		0.10	9.06		0.0100
C-8	J1N3W1	2/1/2012	58.8	X	0.097	41.4	X	0.41	10.9		0.10	9.17		0.0100
C-9	J1N3W2	2/1/2012	50.5	X	0.094	42.6	X	0.40	12.1		0.10	9.21		0.0100
C-10	J1N3W3	2/1/2012	62.4	X	0.092	41.5	X	0.39	7.3		0.10	8.91		0.0100
C-11	J1N3W4	2/1/2012	60.0	X	0.086	39.5	X	0.36	5.9		0.10	9.22		0.0100
C-12	J1N3W5	2/1/2012	51.0	X	0.098	98.2	X	0.41	4.9		0.10	8.81		0.0100
Equipment Blank	J1N019	12/13/2011	0.72	B	0.085	1.8	XC	0.36	0.10	U	0.10			

Attachment	1	Sheet No.	9 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results -Anions

Sample Location	HEIS Number	Sample Date	Bromide			Chloride			Fluoride			Nitrogen in Nitrate			Nitrogen in Nitrite			Nitrogen in Nitrite and Nitrate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	0.38	U	0.38	1.9	U	1.9	0.80	U	0.80	0.82	BJ	0.30	0.33	UR	0.33	0.81		0.32
Duplicate of J1MXX1	J1MXX4	12/12/2011	0.40	U	0.40	2.0	U	2.0	0.84	U	0.84	0.53	BJ	0.32	0.35	UR	0.35	0.35	B	0.32
A-1	J1MXW2	12/12/2011	0.39	U	0.39	5.4		2.0	0.83	U	0.83	0.53	BMJ	0.32	0.34	UR	0.34	0.30	U	0.30
A-2	J1MXW3	12/12/2011	0.39	U	0.39	2.4	B	2.0	0.83	U	0.83	1.5	BJ	0.32	0.34	UR	0.34	1.3		0.30
A-3	J1MXW4	12/12/2011	0.39	U	0.39	2.0	B	2.0	0.83	U	0.83	0.89	BJ	0.32	0.34	UR	0.34	0.74	B	0.31
A-4	J1MXW5	12/12/2011	0.38	U	0.38	1.9	U	1.9	0.81	U	0.81	1.3	BJ	0.31	0.33	UR	0.33	1.4		0.31
A-5	J1MXW6	12/12/2011	0.40	U	0.40	6.0		2.0	0.85	U	0.85	0.76	BJ	0.32	0.35	UR	0.35	0.68	B	0.32
A-6	J1MXW7	12/12/2011	0.39	U	0.39	2.0	U	2.0	0.84	U	0.84	0.40	BJ	0.32	0.34	UR	0.34	0.31	U	0.31
A-7	J1MXW8	12/12/2011	0.38	U	0.38	1.9	U	1.9	0.81	U	0.81	2.4	BJ	0.31	0.33	UR	0.33	2.1		0.30
A-8	J1MXW9	12/12/2011	0.38	U	0.38	1.9	U	1.9	0.80	U	0.80	3.9	J	0.31	0.33	UR	0.33	3.7		0.31
A-9	J1MXX0	12/12/2011	0.38	U	0.38	5.3		1.9	0.81	U	0.81	1.0	BJ	0.31	0.33	UR	0.33	0.77	B	0.32
A-11	J1MXX2	12/12/2011	0.39	U	0.39	2.0	U	2.0	0.83	U	0.83	1.3	BJ	0.32	0.34	UR	0.34	1.0		0.29
A-12	J1MXX3	12/12/2011	0.40	U	0.40	2.2	B	2.0	0.84	U	0.84	4.9	J	0.32	0.34	UR	0.34	5.0		0.31
B-10	J1N015	12/13/2011	0.39	U	0.39	25.6		2.0	0.82	U	0.82	2.6		0.31	0.33	UR	0.33	2.4		0.30
Duplicate of J1N015	J1N018	12/13/2011	0.37	U	0.37	33.8		1.9	0.79	U	0.79	3.2		0.30	0.32	UR	0.32	3.0		0.30
B-1	J1N006	12/13/2011	0.39	U	0.39	2.9	B	2.0	0.83	U	0.83	1.6	B	0.32	0.34	UR	0.34	1.6	C	0.30
B-2	J1N007	12/13/2011	0.39	U	0.39	2.0	U	2.0	0.82	U	0.82	0.66	BM	0.31	0.33	UR	0.33	0.64	BC	0.30
B-3	J1N008	12/13/2011	0.41	U	0.41	2.6	B	2.1	0.87	U	0.87	0.47	B	0.33	0.35	UR	0.35	0.63	BC	0.33
B-4	J1N009	12/13/2011	0.39	U	0.39	2.8	B	2.0	0.83	U	0.83	1.3	B	0.32	0.34	UR	0.34	1.3	C	0.31
B-5	J1N010	12/13/2011	0.48	U	0.48	2.4	U	2.4	1.0	U	1.0	0.39	UR	0.39	0.41	UR	0.41	0.60	BC	0.39
B-6	J1N011	12/13/2011	0.37	U	0.37	3.1	B	1.9	0.78	U	0.78	0.47	B	0.30	0.32	UR	0.32	0.64	BC	0.31
B-7	J1N012	12/13/2011	0.38	U	0.38	1.9	U	1.9	0.81	U	0.81	1.5	B	0.31	0.33	UR	0.33	1.5	C	0.31
B-8	J1N013	12/13/2011	0.37	U	0.37	1.9	U	1.9	0.78	U	0.78	0.49	B	0.30	0.32	UR	0.32	0.54	BC	0.31
B-9	J1N014	12/13/2011	0.39	U	0.39	6.7		2.0	0.83	U	0.83	12.3		0.32	0.34	UR	0.34	9.6		0.31
B-11	J1N016	12/13/2011	0.38	U	0.38	1.9	U	1.9	0.81	U	0.81	1.2	B	0.31	0.33	UR	0.33	1.3	C	0.30
B-12	J1N017	12/13/2011	0.37	U	0.37	1.9	U	1.9	0.79	U	0.79	1.8	B	0.30	0.32	UR	0.32	1.8		0.31
C-6	J1N3V9	2/1/2012	0.40	U	0.40	2.0	U	2.0	0.85	U	0.85	0.85	B	0.32	0.35	UR	0.35	0.50	B	0.33
Duplicate of J1N3V9	J1N3W6	2/1/2012	0.40	U	0.40	2.1	U	2.1	0.86	U	0.86	0.70	B	0.33	0.35	UR	0.35	0.33	B	0.33
C-1	J1N3V4	2/1/2012	0.42	U	0.42	2.1	U	2.1	0.88	U	0.88	1.2	B	0.34	0.36	UR	0.36	1.5		0.33
C-2	J1N3V5	2/1/2012	0.42	U	0.42	2.1	U	2.1	0.89	U	0.89	0.76	B	0.34	0.36	UR	0.36	0.81	B	0.33
C-3	J1N3V6	2/1/2012	0.42	U	0.42	2.1	U	2.1	0.89	U	0.89	0.35	B	0.34	0.36	UR	0.36	0.33	U	0.33
C-4	J1N3V7	2/1/2012	0.41	U	0.41	2.1	U	2.1	0.87	U	0.87	0.60	B	0.33	0.36	UR	0.36	0.33	U	0.33
C-5	J1N3V8	2/1/2012	0.42	U	0.42	2.1	U	2.1	0.88	U	0.88	0.34	UR	0.34	0.36	UR	0.36	0.33	U	0.33
C-7	J1N3W0	2/1/2012	0.40	U	0.40	2.0	U	2.0	0.85	U	0.85	0.33	UR	0.33	0.35	UR	0.35	0.33	U	0.33
C-8	J1N3W1	2/1/2012	0.42	U	0.42	2.1	U	2.1	0.90	U	0.90	0.48	B	0.34	0.37	UR	0.37	0.34	B	0.34
C-9	J1N3W2	2/1/2012	0.44	U	0.44	2.2	U	2.2	0.93	U	0.93	0.35	UR	0.35	0.38	UR	0.38	0.34	U	0.34
C-10	J1N3W3	2/1/2012	0.41	U	0.41	2.1	U	2.1	0.87	U	0.87	0.53	B	0.33	0.36	UR	0.36	0.39	B	0.32
C-11	J1N3W4	2/1/2012	0.40	U	0.40	2.1	U	2.1	0.86	U	0.86	0.50	B	0.33	0.35	UR	0.35	0.37	B	0.32
C-12	J1N3W5	2/1/2012	0.40	U	0.40	2.0	U	2.0	0.84	U	0.84	5.1		0.32	0.34	UR	0.34	11.4		0.32
Equipment Blank	J1N019	12/13/2011																		

Attachment	1	Sheet No.	10 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sampling Results -Anions

Sample Location	HEIS Number	Sample Date	Phosphorus in Phosphate			Sulfate		
			mg/kg	Q	PQL	mg/kg	Q	PQL
A-10	J1MXX1	12/12/2011	1.2	UR	1.2	2.4	B	1.7
Duplicate of J1MXX1	J1MXX4	12/12/2011	1.3	UR	1.3	1.8	U	1.8
A-1	J1MXW2	12/12/2011	1.2	UR	1.2	4.6	B	1.7
A-2	J1MXW3	12/12/2011	1.3	UR	1.3	8.3		1.7
A-3	J1MXW4	12/12/2011	1.2	UR	1.2	7.6		1.7
A-4	J1MXW5	12/12/2011	1.2	UR	1.2	7.9		1.7
A-5	J1MXW6	12/12/2011	1.3	UR	1.3	31.4		1.8
A-6	J1MXW7	12/12/2011	1.3	UR	1.3	1.8	U	1.8
A-7	J1MXW8	12/12/2011	1.2	UR	1.2	7.0		1.7
A-8	J1MXW9	12/12/2011	1.2	UR	1.2	10.5		1.7
A-9	J1MXX0	12/12/2011	1.2	UR	1.2	34.7		1.7
A-11	J1MXX2	12/12/2011	1.3	UR	1.3	11.8		1.8
A-12	J1MXX3	12/12/2011	1.3	UR	1.3	18.8		1.8
B-10	J1N015	12/13/2011	1.2	UR	1.2	76.9		1.7
Duplicate of J1N015	J1N018	12/13/2011	1.2	UR	1.2	91.5		1.7
B-1	J1N006	12/13/2011	1.3	UR	1.3	6.5		1.7
B-2	J1N007	12/13/2011	1.2	UR	1.2	1.7	U	1.7
B-3	J1N008	12/13/2011	1.3	UR	1.3	7.0		1.8
B-4	J1N009	12/13/2011	1.3	UR	1.3	10.1		1.8
B-5	J1N010	12/13/2011	1.5	UR	1.5	2.1	B	2.1
B-6	J1N011	12/13/2011	1.2	UR	1.2	2.2	B	1.7
B-7	J1N012	12/13/2011	1.2	UR	1.2	3.0	B	1.7
B-8	J1N013	12/13/2011	1.2	UR	1.2	1.6	U	1.6
B-9	J1N014	12/13/2011	4.1	B	1.2	8.7		1.7
B-11	J1N016	12/13/2011	1.2	UR	1.2	6.0		1.7
B-12	J1N017	12/13/2011	1.2	UR	1.2	4.0	B	1.7
C-6	J1N3V9	2/1/2012	1.3	UR	1.3	14.1		1.8
Duplicate of J1N3V9	J1N3W6	2/1/2012	1.3	UR	1.3	8.7		1.8
C-1	J1N3V4	2/1/2012	1.7	B	1.3	3.4	B	1.9
C-2	J1N3V5	2/1/2012	1.3	UR	1.3	5.3	B	1.9
C-3	J1N3V6	2/1/2012	1.3	UR	1.3	1.9	U	1.9
C-4	J1N3V7	2/1/2012	1.3	UR	1.3	2.7	B	1.8
C-5	J1N3V8	2/1/2012	1.3	UR	1.3	1.9	B	1.9
C-7	J1N3W0	2/1/2012	1.3	UR	1.3	1.8	U	1.8
C-8	J1N3W1	2/1/2012	1.4	UR	1.4	3.8	B	1.9
C-9	J1N3W2	2/1/2012	1.4	UR	1.4	1.9	U	1.9
C-10	J1N3W3	2/1/2012	1.3	UR	1.3	1.8	U	1.8
C-11	J1N3W4	2/1/2012	1.3	UR	1.3	1.8	U	1.8
C-12	J1N3W5	2/1/2012	1.3	UR	1.3	4.1	B	1.8
Equipment Blank	J1N019	12/13/2011						

Attachment	1	Sheet No.	11 of 33
Originator	N. K. Schiffern	Date	04/03/12
Checked	I. B. Berezovskiy	Date	04/03/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1MXX1, A-10			J1MXX4, Duplicate of J1MXX1			J1MXW2, A-1			J1MXW3, A-2		
		12/12/2011			12/12/2011			12/12/2011			12/12/2011		
		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	26	U	26
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	21	U	21	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	11	U	11
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	9.6	U	9.6	9.8	U	9.8	9.7	U	9.7	9.4	U	9.4
2,4,6-Trichlorophenol	SVOA	9.6	U	9.6	9.8	U	9.8	9.7	U	9.7	9.4	U	9.4
2,4-Dichlorophenol	SVOA	9.6	U	9.6	9.8	U	9.8	9.7	U	9.7	9.4	U	9.4
2,4-Dimethylphenol	SVOA	64	U	64	65	U	65	64	U	64	62	U	62
2,4-Dinitrophenol	SVOA	320	UJ	320	330	UJ	330	320	UJ	320	310	UJ	310
2,4-Dinitrotoluene	SVOA	64	U	64	65	U	65	64	U	64	62	U	62
2,6-Dinitrotoluene	SVOA	27	U	27	27	U	27	27	U	27	26	U	26
2-Chloronaphthalene	SVOA	9.6	U	9.6	9.8	U	9.8	9.7	U	9.7	9.4	U	9.4
2-Chlorophenol	SVOA	20	U	20	21	U	21	20	U	20	20	U	20
2-Methylnaphthalene	SVOA	18	U	18	19	U	19	18	U	18	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	12	U	12
2-Nitroaniline	SVOA	48	U	48	49	U	49	48	U	48	47	U	47
2-Nitrophenol	SVOA	9.6	U	9.6	9.8	U	9.8	9.7	U	9.7	9.4	U	9.4
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	32	U	32	31	U	31
3,3'-Dichlorobenzidine	SVOA	87	U	87	88	U	88	87	U	87	84	U	84
3-Nitroaniline	SVOA	70	U	70	72	U	72	71	U	71	68	U	68
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	320	U	320	310	U	310
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	18	U	18	18	U	18
4-Chloro-3-methylphenol	SVOA	64	U	64	65	U	65	64	U	64	62	U	62
4-Chloroaniline	SVOA	79	U	79	80	U	80	79	U	79	77	U	77
4-Chlorophenylphenyl ether	SVOA	20	U	20	21	U	21	20	U	20	20	U	20
4-Nitroaniline	SVOA	70	U	70	71	U	71	70	U	70	68	U	68
4-Nitrophenol	SVOA	93	U	93	95	U	95	94	U	94	91	U	91
Acenaphthene	SVOA	9.9	U	9.9	10	U	10	10	U	10	9.7	U	9.7
Acenaphthylene	SVOA	16	U	16	17	U	17	16	U	16	16	U	16
Anthracene	SVOA	16	U	16	17	U	17	16	U	16	16	U	16
Benzo(a)anthracene	SVOA	19	U	19	20	U	20	19	U	19	19	U	19
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	19	U	19	19	U	19
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	25	U	25	25	U	25
Benzo(ghi)perylene	SVOA	15	U	15	16	U	16	15	U	15	15	U	15
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	39	U	39	38	U	38
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	22	U	22	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	22	U	22	22	U	22
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	44	U	44	45	U	45	44	U	44	43	U	43
Butylbenzylphthalate	SVOA	41	U	41	42	U	42	42	U	42	40	U	40
Carbazole	SVOA	35	U	35	35	U	35	35	U	35	34	U	34
Chrysene	SVOA	26	U	26	26	U	26	26	U	26	25	U	25
Di-n-butylphthalate	SVOA	28	U	28	28	U	28	28	U	28	27	U	27
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	18	U	18	18	U	18
Dibenzofuran	SVOA	19	U	19	20	U	20	19	U	19	19	U	19
Diethyl phthalate	SVOA	25	U	25	25	U	25	25	U	25	24	U	24
Dimethyl phthalate	SVOA	660	U	22	660	U	23	660	U	22	660	U	22
Fluoranthene	SVOA	35	U	35	35	U	35	35	U	35	34	U	34
Fluorene	SVOA	17	U	17	18	U	18	17	U	17	17	U	17
Hexachlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27
Hexachlorobutadiene	SVOA	9.6	U	9.6	9.8	U	9.8	9.7	U	9.7	9.4	U	9.4
Hexachlorocyclopentadiene	SVOA	48	U	48	49	U	49	48	U	48	47	U	47
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	20	U	20
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	21	U	21	21	U	21
Isophorone	SVOA	16	U	16	17	U	17	16	U	16	16	U	16
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	30	U	30	29	U	29
N-Nitrosodiphenylamine	SVOA	20	U	20	21	U	21	20	U	20	20	U	20
Naphthalene	SVOA	30	U	30	30	U	30	30	U	30	29	U	29
Nitrobenzene	SVOA	21	U	21	22	U	22	21	U	21	21	U	21
Pentachlorophenol	SVOA	320	U	320	320	U	320	320	U	320	310	U	310
Phenanthrene	SVOA	16	U	16	17	U	17	16	U	16	16	U	16
Phenol	SVOA	17	U	17	18	U	18	17	U	17	17	U	17
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	11	U	11

Attachment	1	Sheet No.	12 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1MXW4, A-3 12/12/2011			J1MXW5, A-4 12/12/2011			J1MXW6, A-5 12/12/2011			J1MXW7, A-6 12/12/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27	28	U	28	28	U	28	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
2,4-Dichlorophenol	SVOA	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
2,4-Dimethylphenol	SVOA	64	U	64	65	U	65	66	U	66	67	U	67
2,4-Dinitrophenol	SVOA	320	UJ	320	330	UJ	330	330	UJ	330	340	UJ	340
2,4-Dinitrotoluene	SVOA	64	U	64	65	U	65	66	U	66	67	U	67
2,6-Dinitrotoluene	SVOA	27	U	27	28	U	28	28	U	28	28	U	28
2-Chloronaphthalene	SVOA	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
2-Chlorophenol	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	18	U	18	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	48	U	48	50	U	50	50	U	50	51	U	51
2-Nitrophenol	SVOA	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	33	U	33	33	U	33	34	U	34
3,3'-Dichlorobenzidine	SVOA	87	U	87	89	U	89	90	U	90	91	U	91
3-Nitroaniline	SVOA	71	U	71	72	U	72	73	U	73	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	330	U	330	330	U	330	340	U	340
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	65	U	65	66	U	66	67	U	67
4-Chloroaniline	SVOA	79	U	79	81	U	81	82	U	82	83	U	83
4-Chlorophenylphenyl ether	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
4-Nitroaniline	SVOA	70	U	70	72	U	72	72	U	72	74	U	74
4-Nitrophenol	SVOA	94	U	94	96	U	96	97	U	97	99	U	99
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	26	U	26	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	40	U	40	40	U	40	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	46	U	46	46	U	46	47	U	47
Butylbenzylphthalate	SVOA	42	U	42	43	U	43	43	U	43	44	U	44
Carbazole	SVOA	35	U	35	36	U	36	36	U	36	37	U	37
Chrysene	SVOA	26	U	26	27	U	27	27	U	27	27	U	27
Di-n-butylphthalate	SVOA	28	U	28	29	U	29	29	U	29	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	15	U	15
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	19	U	19	20	U	20	20	U	20	20	U	20
Diethyl phthalate	SVOA	25	U	25	26	U	26	26	U	26	26	U	26
Dimethyl phthalate	SVOA	660	U	22	660	U	23	660	U	23	660	U	23
Fluoranthene	SVOA	35	U	35	36	U	36	36	U	36	37	U	37
Fluorene	SVOA	17	U	17	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	28	U	28	29	U	29	29	U	29	29	U	29
Hexachlorobutadiene	SVOA	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
Hexachlorocyclopentadiene	SVOA	48	U	48	50	U	50	50	U	50	51	U	51
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	22	U	22	22	U	22
Isophorone	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	31	U	31	31	U	31	32	U	32
N-Nitrosodiphenylamine	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
Naphthalene	SVOA	30	U	30	31	U	31	31	U	31	32	U	32
Nitrobenzene	SVOA	21	U	21	22	U	22	22	U	22	22	U	22
Pentachlorophenol	SVOA	320	U	320	330	U	330	330	U	330	340	U	340
Phenanthrene	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Phenol	SVOA	17	U	17	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12

Attachment	1	Sheet No.	13 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1MXW8, A-7			J1MXW9, A-8			J1MXX0, A-9			J1MXX2, A-11		
		12/12/2011			12/12/2011			12/12/2011			12/12/2011		
		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	27	U	27
1,2-Dichlorobenzene	SVOA	21	U	21	21	U	21	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	13	U	13	14	U	14	13	U	13
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.9	U	9.9	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.9	U	9.9	9.8	U	9.8
2,4-Dichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.9	U	9.9	9.8	U	9.8
2,4-Dimethylphenol	SVOA	64	U	64	64	U	64	66	U	66	65	U	65
2,4-Dinitrophenol	SVOA	320	UJ	320	330	UJ	330	330	UJ	330	330	UJ	330
2,4-Dinitrotoluene	SVOA	64	U	64	64	U	64	66	U	66	65	U	65
2,6-Dinitrotoluene	SVOA	27	U	27	27	U	27	28	U	28	27	U	27
2-Chloronaphthalene	SVOA	9.7	U	9.7	9.8	U	9.8	9.9	U	9.9	9.8	U	9.8
2-Chlorophenol	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	18	U	18	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	49	U	49	50	U	50	49	U	49
2-Nitrophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.9	U	9.9	9.8	U	9.8
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	33	U	33	32	U	32
3,3'-Dichlorobenzidine	SVOA	87	U	87	88	U	88	89	U	89	88	U	88
3-Nitroaniline	SVOA	71	U	71	71	U	71	72	U	72	71	U	71
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	330	U	330	320	U	320
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	64	U	64	66	U	66	65	U	65
4-Chloroaniline	SVOA	80	U	80	80	U	80	81	U	81	80	U	80
4-Chlorophenylphenyl ether	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
4-Nitroaniline	SVOA	70	U	70	71	U	71	72	U	72	71	U	71
4-Nitrophenol	SVOA	94	U	94	95	U	95	96	U	96	95	U	95
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	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	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	40	U	40	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	22	U	22	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	22	U	22	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	45	U	45	46	U	46	45	U	45
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	43	U	43	42	U	42
Carbazole	SVOA	35	U	35	35	U	35	36	U	36	35	U	35
Chrysene	SVOA	26	U	26	26	U	26	27	U	27	26	U	26
Di-n-butylphthalate	SVOA	28	U	28	28	U	28	29	U	29	28	U	28
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	19	U	19	20	U	20	20	U	20	20	U	20
Diethyl phthalate	SVOA	25	U	25	25	U	25	26	U	26	25	U	25
Dimethyl phthalate	SVOA	660	U	22	660	U	22	660	U	23	660	U	23
Fluoranthene	SVOA	35	U	35	35	U	35	36	U	36	35	U	35
Fluorene	SVOA	17	U	17	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	28	U	28	28	U	28	29	U	29	28	U	28
Hexachlorobutadiene	SVOA	9.7	U	9.7	9.8	U	9.8	9.9	U	9.9	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	50	U	50	49	U	49
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	21	U	21	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	31	U	31	30	U	30
N-Nitrosodiphenylamine	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
Naphthalene	SVOA	30	U	30	30	U	30	31	U	31	30	U	30
Nitrobenzene	SVOA	21	U	21	21	U	21	22	U	22	22	U	22
Pentachlorophenol	SVOA	320	U	320	320	U	320	330	U	330	320	U	320
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
Phenol	SVOA	17	U	17	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12

Attachment	1	Sheet No.	14 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1MXX3, A-12			J1N015, B-10			J1N018, Duplicate of J1N015			J1N006, B-1		
		12/12/2011			12/13/2011			1/0/1900			12/13/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27	28	U	28	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	21	U	21	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	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8
2,4-Dichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8
2,4-Dimethylphenol	SVOA	64	U	64	65	U	65	64	U	64	65	U	65
2,4-Dinitrophenol	SVOA	320	UJ	320	330	U	330	320	U	320	330	U	330
2,4-Dinitrotoluene	SVOA	64	U	64	65	U	65	64	U	64	65	U	65
2,6-Dinitrotoluene	SVOA	27	U	27	28	U	28	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.7	U	9.7	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8
2-Chlorophenol	SVOA	20	U	20	21	U	21	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	18	U	18	19	U	19	18	U	18	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	49	U	49	48	U	48	49	U	49
2-Nitrophenol	SVOA	9.7	U	9.7	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	32	U	32	32	U	32
3,3'-Dichlorobenzidine	SVOA	87	U	87	89	U	89	87	U	87	89	U	89
3-Nitroaniline	SVOA	71	U	71	72	U	72	71	U	71	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	320	U	320	320	U	320
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	65	U	65	64	U	64	65	U	65
4-Chloroaniline	SVOA	80	U	80	81	U	81	79	U	79	81	U	81
4-Chlorophenylphenyl ether	SVOA	20	U	20	21	U	21	20	U	20	21	U	21
4-Nitroaniline	SVOA	70	U	70	71	U	71	70	U	70	71	U	71
4-Nitrophenol	SVOA	94	U	94	95	U	95	94	U	94	95	U	95
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	19	U	19	20	U	20	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	25	U	25	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	39	U	39	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	45	U	45	44	U	44	45	U	45
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	42	U	42	42	U	42
Carbazole	SVOA	35	U	35	35	U	35	35	U	35	35	U	35
Chrysene	SVOA	26	U	26	27	U	27	26	U	26	27	U	27
Di-n-butylphthalate	SVOA	28	U	28	29	U	29	28	U	28	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	18	U	18	19	U	19
Dibenzofuran	SVOA	19	U	19	20	U	20	19	U	19	20	U	20
Diethyl phthalate	SVOA	25	U	25	26	U	26	25	U	25	26	U	26
Dimethyl phthalate	SVOA	660	U	22	170	JB	23	120	JB	22	190	JB	23
Fluoranthene	SVOA	35	U	35	35	U	35	35	U	35	35	U	35
Fluorene	SVOA	17	U	17	18	U	18	17	U	17	18	U	18
Hexachlorobenzene	SVOA	28	U	28	29	U	29	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.7	U	9.7	9.8	U	9.8	9.7	U	9.7	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	48	U	48	49	U	49
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	21	U	21	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	31	U	31	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	20	U	20	21	U	21	20	U	20	21	U	21
Naphthalene	SVOA	30	U	30	31	U	31	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	22	U	22	21	U	21	22	U	22
Pentachlorophenol	SVOA	320	U	320	320	U	320	320	U	320	320	U	320
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	17	U	17
Phenol	SVOA	17	U	17	18	U	18	17	U	17	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12

Attachment	1	Sheet No.	15 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1N007, B-2 12/13/2011			J1N008, B-3 12/13/2011			J1N009, B-4 12/13/2011			J1N010, B-5 12/13/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27	29	U	29	26	U	26	34	U	34
1,2-Dichlorobenzene	SVOA	21	U	21	23	U	23	21	U	21	27	U	27
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	11	U	11	15	U	15
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	17	U	17
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.3	U	9.3	12	U	12
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.3	U	9.3	12	U	12
2,4-Dichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.3	U	9.3	12	U	12
2,4-Dimethylphenol	SVOA	64	U	64	68	U	68	62	U	62	81	U	81
2,4-Dinitrophenol	SVOA	320	U	320	340	U	340	310	U	310	410	U	410
2,4-Dinitrotoluene	SVOA	64	U	64	68	U	68	62	U	62	81	U	81
2,6-Dinitrotoluene	SVOA	27	U	27	29	U	29	26	U	26	34	U	34
2-Chloronaphthalene	SVOA	9.7	U	9.7	10	U	10	9.3	U	9.3	12	U	12
2-Chlorophenol	SVOA	20	U	20	22	U	22	20	U	20	26	U	26
2-Methylnaphthalene	SVOA	18	U	18	19	U	19	18	U	18	23	U	23
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	12	U	12	16	U	16
2-Nitroaniline	SVOA	49	U	49	51	U	51	47	U	47	61	U	61
2-Nitrophenol	SVOA	9.7	U	9.7	10	U	10	9.3	U	9.3	12	U	12
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	34	U	34	31	U	31	40	U	40
3,3'-Dichlorobenzidine	SVOA	88	U	88	92	U	92	84	U	84	110	U	110
3-Nitroaniline	SVOA	71	U	71	75	U	75	68	U	68	90	U	90
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	340	U	340	310	U	310	400	U	400
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	18	U	18	23	U	23
4-Chloro-3-methylphenol	SVOA	64	U	64	68	U	68	62	U	62	81	U	81
4-Chloroaniline	SVOA	80	U	80	84	U	84	77	U	77	100	U	100
4-Chlorophenylphenyl ether	SVOA	20	U	20	22	U	22	20	U	20	26	U	26
4-Nitroaniline	SVOA	70	U	70	74	U	74	68	U	68	89	U	89
4-Nitrophenol	SVOA	94	U	94	99	U	99	91	U	91	120	U	120
Acenaphthene	SVOA	10	U	10	11	U	11	9.6	U	9.6	13	U	13
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	21	U	21
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	21	U	21
Benzo(a)anthracene	SVOA	19	U	19	20	U	20	19	U	19	25	U	25
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	19	U	19	25	U	25
Benzo(b)fluoranthene	SVOA	25	U	25	27	U	27	24	U	24	32	U	32
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	20	U	20
Benzo(k)fluoranthene	SVOA	39	U	39	41	U	41	37	U	37	49	U	49
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	24	U	24	21	U	21	28	U	28
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	24	U	24	21	U	21	28	U	28
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	16	U	16	20	U	20
Bis(2-ethylhexyl) phthalate	SVOA	92	J	45	47	U	47	43	U	43	56	U	56
Butylbenzylphthalate	SVOA	42	U	42	44	U	44	40	U	40	53	U	53
Carbazole	SVOA	35	U	35	37	U	37	34	U	34	44	U	44
Chrysene	SVOA	26	U	26	28	U	28	25	U	25	33	U	33
Di-n-butylphthalate	SVOA	28	U	28	30	U	30	27	U	27	36	U	36
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	13	U	13	18	U	18
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	18	U	18	23	U	23
Dibenzofuran	SVOA	19	U	19	20	U	20	19	U	19	25	U	25
Diethyl phthalate	SVOA	25	U	25	27	U	27	24	U	24	32	U	32
Dimethyl phthalate	SVOA	170	JB	22	210	JB	24	240	JB	21	220	JB	28
Fluoranthene	SVOA	35	U	35	37	U	37	34	U	34	44	U	44
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	22	U	22
Hexachlorobenzene	SVOA	28	U	28	30	U	30	27	U	27	36	U	36
Hexachlorobutadiene	SVOA	9.7	U	9.7	10	U	10	9.3	U	9.3	12	U	12
Hexachlorocyclopentadiene	SVOA	49	U	49	51	U	51	47	U	47	61	U	61
Hexachloroethane	SVOA	21	U	21	22	U	22	20	U	20	26	U	26
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	23	U	23	21	U	21	27	U	27
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	21	U	21
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	32	U	32	29	U	29	38	U	38
N-Nitrosodiphenylamine	SVOA	20	U	20	22	U	22	20	U	20	26	U	26
Naphthalene	SVOA	30	U	30	32	U	32	29	U	29	38	U	38
Nitrobenzene	SVOA	21	U	21	23	U	23	21	U	21	27	U	27
Pentachlorophenol	SVOA	320	U	320	340	U	340	310	U	310	400	U	400
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	21	U	21
Phenol	SVOA	18	U	18	18	U	18	17	U	17	22	U	22
Pyrene	SVOA	12	U	12	12	U	12	11	U	11	15	U	15

Attachment	1	Sheet No.	16 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1N011, B-6 12/13/2011			J1N012, B-7 12/13/2011			J1N013, B-8 12/13/2011			J1N014, B-9 12/13/2011		
		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	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	21	U	21	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	13	U	13	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
2,4,6-Trichlorophenol	SVOA	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
2,4-Dichlorophenol	SVOA	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
2,4-Dimethylphenol	SVOA	63	U	63	64	U	64	65	U	65	66	U	66
2,4-Dinitrophenol	SVOA	320	U	320	320	U	320	330	U	330	330	U	330
2,4-Dinitrotoluene	SVOA	63	U	63	64	U	64	65	U	65	66	U	66
2,6-Dinitrotoluene	SVOA	27	U	27	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
2-Chlorophenol	SVOA	20	U	20	20	U	20	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	12	U	12	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	48	U	48	49	U	49	49	U	49	50	U	50
2-Nitrophenol	SVOA	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	32	U	32	33	U	33
3,3'-Dichlorobenzidine	SVOA	86	U	86	88	U	88	88	U	88	90	U	90
3-Nitroaniline	SVOA	70	U	70	71	U	71	71	U	71	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	320	U	320	330	U	330
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	63	U	63	64	U	64	65	U	65	66	U	66
4-Chloroaniline	SVOA	79	U	79	80	U	80	80	U	80	82	U	82
4-Chlorophenylphenyl ether	SVOA	20	U	20	20	U	20	21	U	21	21	U	21
4-Nitroaniline	SVOA	70	U	70	71	U	71	71	U	71	73	U	73
4-Nitrophenol	SVOA	93	U	93	94	U	94	95	U	95	97	U	97
Acenaphthene	SVOA	9.9	U	9.9	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	19	U	19	19	U	19	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	19	U	19	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	15	U	15	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	38	U	38	39	U	39	39	U	39	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	22	U	22	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	44	U	44	45	U	45	45	U	45	46	U	46
Butylbenzylphthalate	SVOA	41	U	41	42	U	42	42	U	42	43	U	43
Carbazole	SVOA	35	U	35	35	U	35	35	U	35	36	U	36
Chrysene	SVOA	26	U	26	26	U	26	26	U	26	27	U	27
Di-n-butylphthalate	SVOA	28	U	28	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
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	19	U	19	19	U	19	20	U	20	20	U	20
Diethyl phthalate	SVOA	25	U	25	25	U	25	25	U	25	26	U	26
Dimethyl phthalate	SVOA	120	JB	22	120	JB	22	200	JB	22	180	JB	23
Fluoranthene	SVOA	35	U	35	35	U	35	35	U	35	36	U	36
Fluorene	SVOA	17	U	17	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
Hexachlorocyclopentadiene	SVOA	48	U	48	49	U	49	49	U	49	50	U	50
Hexachloroethane	SVOA	20	U	20	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	21	U	21	22	U	22	22	U	22
Isophorone	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	20	U	20	20	U	20	21	U	21	21	U	21
Naphthalene	SVOA	30	U	30	30	U	30	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	21	U	21	22	U	22	22	U	22
Pentachlorophenol	SVOA	320	U	320	320	U	320	320	U	320	330	U	330
Phenanthrene	SVOA	16	U	16	17	U	17	17	U	17	17	U	17
Phenol	SVOA	17	U	17	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12

Attachment	1	Sheet No.	17 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1N016, B-11			J1N017, B-12			J1N3V9, C-6			J1N3W6, Duplicate of J1N3V9		
		12/13/2011			12/13/2011			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	27	U	27	31	U	31	29	U	29
1,2-Dichlorobenzene	SVOA	22	U	22	21	U	21	24	U	24	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	13	U	13	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	15	U	15	14	U	14
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	9.8	U	9.8	11	U	11	10	U	10
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	9.8	U	9.8	11	U	11	10	U	10
2,4-Dichlorophenol	SVOA	9.9	U	9.9	9.8	U	9.8	11	U	11	10	U	10
2,4-Dimethylphenol	SVOA	65	U	65	64	U	64	72	U	72	68	U	68
2,4-Dinitrophenol	SVOA	330	U	330	320	U	320	360	U	360	340	U	340
2,4-Dinitrotoluene	SVOA	65	U	65	64	U	64	72	U	72	68	U	68
2,6-Dinitrotoluene	SVOA	28	U	28	27	U	27	31	U	31	29	U	29
2-Chloronaphthalene	SVOA	9.9	U	9.9	9.8	U	9.8	11	U	11	10	U	10
2-Chlorophenol	SVOA	21	U	21	20	U	20	23	U	23	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	21	U	21	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	14	U	14	13	U	13
2-Nitroaniline	SVOA	50	U	50	49	U	49	55	U	55	51	U	51
2-Nitrophenol	SVOA	9.9	U	9.9	9.8	U	9.8	11	U	11	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	32	U	32	36	U	36	34	U	34
3,3'-Dichlorobenzidine	SVOA	89	U	89	88	U	88	98	U	98	92	U	92
3-Nitroaniline	SVOA	72	U	72	71	U	71	80	U	80	75	U	75
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	320	U	320	360	U	360	340	U	340
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	21	U	21	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	64	U	64	72	U	72	68	U	68
4-Chloroaniline	SVOA	81	U	81	80	U	80	89	U	89	84	U	84
4-Chlorophenylphenyl ether	SVOA	21	U	21	20	U	20	23	U	23	21	U	21
4-Nitroaniline	SVOA	72	U	72	71	U	71	79	U	79	74	U	74
4-Nitrophenol	SVOA	96	U	96	95	U	95	110	U	110	99	U	99
Acenaphthene	SVOA	10	U	10	10	U	10	11	U	11	11	U	11
Acenaphthylene	SVOA	17	U	17	17	U	17	19	U	19	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	19	U	19	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	22	U	22	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	22	U	22	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	29	U	29	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	17	U	17	16	U	16
Benzo(k)fluoranthene	SVOA	40	U	40	39	U	39	44	U	44	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	22	U	22	25	U	25	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	22	U	22	25	U	25	24	U	24
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	18	U	18	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	45	U	45	92	JB	50	86	JB	47
Butylbenzylphthalate	SVOA	43	U	43	42	U	42	47	U	47	44	U	44
Carbazole	SVOA	36	U	36	35	U	35	39	U	39	37	U	37
Chrysene	SVOA	27	U	27	26	U	26	29	U	29	28	U	28
Di-n-butylphthalate	SVOA	29	U	29	28	U	28	32	U	32	30	U	30
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	16	U	16	15	U	15
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	21	U	21	19	U	19
Dibenzofuran	SVOA	20	U	20	20	U	20	22	U	22	20	U	20
Diethyl phthalate	SVOA	26	U	26	25	U	25	28	U	28	27	U	27
Dimethyl phthalate	SVOA	160	JB	23	150	JB	22	200	JB	25	94	JB	24
Fluoranthene	SVOA	36	U	36	35	U	35	39	U	39	37	U	37
Fluorene	SVOA	18	U	18	18	U	18	20	U	20	18	U	18
Hexachlorobenzene	SVOA	29	U	29	28	U	28	32	U	32	30	U	30
Hexachlorobutadiene	SVOA	9.9	U	9.9	9.8	U	9.8	11	U	11	10	U	10
Hexachlorocyclopentadiene	SVOA	50	U	50	49	U	49	55	U	55	51	U	51
Hexachloroethane	SVOA	21	U	21	21	U	21	23	U	23	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	21	U	21	24	U	24	23	U	23
Isophorone	SVOA	17	U	17	17	U	17	19	U	19	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	30	U	30	34	U	34	32	U	32
N-Nitrosodiphenylamine	SVOA	21	U	21	20	U	20	23	U	23	21	U	21
Naphthalene	SVOA	31	U	31	30	U	30	34	U	34	32	U	32
Nitrobenzene	SVOA	22	U	22	21	U	21	24	U	24	23	U	23
Pentachlorophenol	SVOA	330	U	330	320	U	320	360	U	360	340	U	340
Phenanthrene	SVOA	17	U	17	17	U	17	19	U	19	17	U	17
Phenol	SVOA	18	U	18	18	U	18	20	U	20	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	13	U	13	12	U	12

Attachment	1	Sheet No.	18 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1N3V4, C-1			J1NLP4, C-1 resample[a]			J1N3V5, C-2			J1N3V6, C-3		
		2/1/2012			3/12/2012			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	29	U	29
1,2-Dichlorobenzene	SVOA	23	U	23	22	U	22	23	U	23	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	13	U	13
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	11	U	11
2,4,6-Trichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	11	U	11
2,4-Dichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	11	U	11
2,4-Dimethylphenol	SVOA	68	U	68	67	U	67	68	U	68	69	U	69
2,4-Dinitrophenol	SVOA	340	U	340	340	U	340	340	UX	340	350	U	350
2,4-Dinitrotoluene	SVOA	68	U	68	67	U	67	68	U	68	69	U	69
2,6-Dinitrotoluene	SVOA	29	U	29	29	U	29	29	U	29	29	U	29
2-Chloronaphthalene	SVOA	10	U	10	10	U	10	10	U	10	11	U	11
2-Chlorophenol	SVOA	22	U	22	21	U	21	22	U	22	22	U	22
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	20	U	20	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	14	U	14
2-Nitroaniline	SVOA	51	U	51	51	U	51	52	U	52	53	U	53
2-Nitrophenol	SVOA	10	U	10	10	U	10	10	U	10	11	U	11
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	34	U	34	34	U	34	35	U	35
3,3'-Dichlorobenzidine	SVOA	92	U	92	92	U	92	93	U	93	95	U	95
3-Nitroaniline	SVOA	75	U	75	75	U	75	75	U	75	77	U	77
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	340	U	340	340	UX	340	350	U	350
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	20	U	20	20	U	20
4-Chloro-3-methylphenol	SVOA	68	U	68	67	U	67	68	U	68	69	U	69
4-Chloroaniline	SVOA	84	U	84	84	U	84	84	U	84	86	U	86
4-Chlorophenylphenyl ether	SVOA	22	U	22	21	U	21	22	U	22	22	U	22
4-Nitroaniline	SVOA	74	U	74	74	U	74	75	U	75	76	U	76
4-Nitrophenol	SVOA	99	U	99	99	U	99	100	U	100	100	U	100
Acenaphthene	SVOA	11	U	11	11	U	11	11	U	11	11	U	11
Acenaphthylene	SVOA	17	U	17	17	U	17	18	U	18	18	U	18
Anthracene	SVOA	17	U	17	17	U	17	18	U	18	18	U	18
Benzo(a)anthracene	SVOA	21	U	21	20	U	20	21	U	21	21	U	21
Benzo(a)pyrene	SVOA	21	U	21	20	U	20	21	U	21	21	U	21
Benzo(b)fluoranthene	SVOA	27	U	27	27	U	27	27	U	27	28	U	28
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	17	U	17
Benzo(k)fluoranthene	SVOA	41	U	41	41	U	41	41	U	41	42	U	42
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	24	U	24	24	U	24	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	24	U	24	24	U	24	24	U	24
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	120	JB	47	83	JB	47	85	JB	47	87	JB	48
Butylbenzylphthalate	SVOA	44	U	44	44	U	44	44	U	44	45	U	45
Carbazole	SVOA	37	U	37	37	U	37	37	U	37	38	U	38
Chrysene	SVOA	28	U	28	28	U	28	28	U	28	28	U	28
Di-n-butylphthalate	SVOA	30	U	30	30	U	30	30	U	30	31	U	31
Di-n-octylphthalate	SVOA	15	U	15	15	U	15	15	U	15	15	U	15
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	20	U	20	20	U	20
Dibenzofuran	SVOA	21	U	21	20	U	20	21	U	21	21	U	21
Diethyl phthalate	SVOA	27	U	27	27	U	27	27	U	27	27	U	27
Dimethyl phthalate	SVOA	24	U	24	24	U	24	220	JB	24	150	JB	24
Fluoranthene	SVOA	37	U	37	37	U	37	37	U	37	38	U	38
Fluorene	SVOA	18	U	18	18	U	18	19	U	19	19	U	19
Hexachlorobenzene	SVOA	30	U	30	30	U	30	30	U	30	31	U	31
Hexachlorobutadiene	SVOA	10	U	10	10	U	10	10	U	10	11	U	11
Hexachlorocyclopentadiene	SVOA	51	U	51	51	U	51	52	U	52	53	U	53
Hexachloroethane	SVOA	22	U	22	22	U	22	22	U	22	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	22	U	22	23	U	23	23	U	23
Isophorone	SVOA	17	U	17	17	U	17	18	U	18	18	U	18
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	32	U	32	32	U	32	33	U	33
N-Nitrosodiphenylamine	SVOA	22	U	22	21	U	21	22	U	22	22	U	22
Naphthalene	SVOA	32	U	32	32	U	32	32	U	32	33	U	33
Nitrobenzene	SVOA	23	U	23	22	U	22	23	U	23	23	U	23
Pentachlorophenol	SVOA	360	J	340	340	U	340	340	U	340	370	J	350
Phenanthrene	SVOA	17	U	17	17	U	17	18	U	18	18	U	18
Phenol	SVOA	50	J	18	18	U	18	19	U	19	19	U	19
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	13	U	13

Attachment	1	Sheet No.	19 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1NLP5, C-3 resample[a]			J1N3V7, C-4			J1N3V8, C-5			J1N3W0, C-7		
		3/12/12 10:10			2/1/2012			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	31	U	31	28	U	28	30	U	30
1,2-Dichlorobenzene	SVOA	23	U	23	24	U	24	22	U	22	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	13	U	13	12	U	12	13	U	13
1,4-Dichlorobenzene	SVOA	14	U	14	15	U	15	14	U	14	15	U	15
2,4,5-Trichlorophenol	SVOA	10	U	10	11	U	11	10	U	10	11	U	11
2,4,6-Trichlorophenol	SVOA	10	U	10	11	U	11	10	U	10	11	U	11
2,4-Dichlorophenol	SVOA	10	U	10	11	U	11	10	U	10	11	U	11
2,4-Dimethylphenol	SVOA	68	U	68	72	U	72	67	U	67	70	U	70
2,4-Dinitrophenol	SVOA	340	UX	340	360	U	360	340	U	340	360	U	360
2,4-Dinitrotoluene	SVOA	68	U	68	72	U	72	67	U	67	70	U	70
2,6-Dinitrotoluene	SVOA	29	U	29	31	U	31	28	U	28	30	U	30
2-Chloronaphthalene	SVOA	10	U	10	11	U	11	10	U	10	11	U	11
2-Chlorophenol	SVOA	22	U	22	23	U	23	21	U	21	22	U	22
2-Methylnaphthalene	SVOA	20	U	20	21	U	21	19	U	19	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	14	U	14	13	U	13	14	U	14
2-Nitroaniline	SVOA	52	U	52	55	U	55	51	U	51	53	U	53
2-Nitrophenol	SVOA	10	U	10	11	U	11	10	U	10	11	U	11
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	36	U	36	33	U	33	35	U	35
3,3'-Dichlorobenzidine	SVOA	93	U	93	98	U	98	91	U	91	96	U	96
3-Nitroaniline	SVOA	75	U	75	80	U	80	74	U	74	78	U	78
4,6-Dinitro-2-methylphenol	SVOA	340	UX	340	360	U	360	330	U	330	350	U	350
4-Bromophenylphenyl ether	SVOA	20	U	20	21	U	21	19	U	19	20	U	20
4-Chloro-3-methylphenol	SVOA	68	U	68	72	U	72	67	U	67	70	U	70
4-Chloroaniline	SVOA	84	U	84	89	U	89	83	U	83	87	U	87
4-Chlorophenylphenyl ether	SVOA	22	U	22	23	U	23	21	U	21	22	U	22
4-Nitroaniline	SVOA	75	U	75	79	U	79	74	U	74	77	U	77
4-Nitrophenol	SVOA	100	U	100	110	U	110	98	U	98	100	U	100
Acenaphthene	SVOA	11	U	11	11	U	11	10	U	10	11	U	11
Acenaphthylene	SVOA	18	U	18	19	U	19	17	U	17	18	U	18
Anthracene	SVOA	18	U	18	19	U	19	17	U	17	18	U	18
Benzo(a)anthracene	SVOA	21	U	21	22	U	22	20	U	20	21	U	21
Benzo(a)pyrene	SVOA	21	U	21	22	U	22	20	U	20	21	U	21
Benzo(b)fluoranthene	SVOA	27	U	27	29	U	29	27	U	27	28	U	28
Benzo(ghi)perylene	SVOA	16	U	16	17	U	17	16	U	16	17	U	17
Benzo(k)fluoranthene	SVOA	41	U	41	44	U	44	41	U	41	43	U	43
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	25	U	25	23	U	23	25	U	25
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	25	U	25	23	U	23	25	U	25
Bis(2-chloroethyl) ether	SVOA	17	U	17	18	U	18	17	U	17	18	U	18
Bis(2-ethylhexyl) phthalate	SVOA	82	JB	47	90	JB	50	83	JB	47	92	JB	49
Butylbenzylphthalate	SVOA	44	U	44	47	U	47	44	U	44	46	U	46
Carbazole	SVOA	37	U	37	39	U	39	37	U	37	38	U	38
Chrysene	SVOA	28	U	28	29	U	29	27	U	27	29	U	29
Di-n-butylphthalate	SVOA	30	U	30	32	U	32	29	U	29	31	U	31
Di-n-octylphthalate	SVOA	15	U	15	16	U	16	15	U	15	15	U	15
Dibenz[a,h]anthracene	SVOA	20	U	20	21	U	21	19	U	19	20	U	20
Dibenzofuran	SVOA	21	U	21	22	U	22	20	U	20	21	U	21
Diethyl phthalate	SVOA	27	U	27	28	U	28	26	U	26	28	U	28
Dimethyl phthalate	SVOA	24	U	24	25	U	25	140	JB	23	25	U	25
Fluoranthene	SVOA	37	U	37	39	U	39	37	U	37	38	U	38
Fluorene	SVOA	19	U	19	20	U	20	18	U	18	19	U	19
Hexachlorobenzene	SVOA	30	U	30	32	U	32	29	U	29	31	U	31
Hexachlorobutadiene	SVOA	10	U	10	11	U	11	10	U	10	11	U	11
Hexachlorocyclopentadiene	SVOA	52	U	52	55	U	55	51	U	51	53	U	53
Hexachloroethane	SVOA	22	U	22	23	U	23	22	U	22	23	U	23
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	24	U	24	22	U	22	23	U	23
Isophorone	SVOA	18	U	18	19	U	19	17	U	17	18	U	18
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	34	U	34	31	U	31	33	U	33
N-Nitrosodiphenylamine	SVOA	22	U	22	23	U	23	21	U	21	22	U	22
Naphthalene	SVOA	32	U	32	34	U	34	31	U	31	33	U	33
Nitrobenzene	SVOA	23	U	23	24	U	24	22	U	22	23	U	23
Pentachlorophenol	SVOA	340	U	340	360	U	360	330	U	330	350	U	350
Phenanthrene	SVOA	18	U	18	19	U	19	17	U	17	18	U	18
Phenol	SVOA	19	U	19	35	J	20	18	U	18	46	J	19
Pyrene	SVOA	12	U	12	13	U	13	12	U	12	13	U	13

Attachment	1	Sheet No.	20 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1N3W1, C-8			J1N3W2, C-9			J1N3W3, C-10			J1N3W4, C-11		
		2/1/2012			2/1/2012			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	30	U	30	31	U	31	30	U	30	28	U	28
1,2-Dichlorobenzene	SVOA	24	U	24	24	U	24	24	U	24	22	U	22
1,3-Dichlorobenzene	SVOA	13	U	13	13	U	13	13	U	13	12	U	12
1,4-Dichlorobenzene	SVOA	15	U	15	15	U	15	15	U	15	14	U	14
2,4,5-Trichlorophenol	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
2,4,6-Trichlorophenol	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
2,4-Dichlorophenol	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
2,4-Dimethylphenol	SVOA	71	U	71	72	U	72	71	U	71	66	U	66
2,4-Dinitrophenol	SVOA	360	U	360	370	U	370	360	U	360	330	U	330
2,4-Dinitrotoluene	SVOA	71	U	71	72	U	72	71	U	71	66	U	66
2,6-Dinitrotoluene	SVOA	30	U	30	31	U	31	30	U	30	28	U	28
2-Chloronaphthalene	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
2-Chlorophenol	SVOA	23	U	23	23	U	23	23	U	23	21	U	21
2-Methylnaphthalene	SVOA	21	U	21	21	U	21	21	U	21	19	U	19
2-Methylphenol (cresol, o-)	SVOA	14	U	14	14	U	14	14	U	14	13	U	13
2-Nitroaniline	SVOA	54	U	54	55	U	55	54	U	54	50	U	50
2-Nitrophenol	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
3+4 Methylphenol (cresol, m+p)	SVOA	36	U	36	36	U	36	36	U	36	33	U	33
3,3'-Dichlorobenzidine	SVOA	97	U	97	99	U	99	97	U	97	90	U	90
3-Nitroaniline	SVOA	79	U	79	80	U	80	79	U	79	73	U	73
4,6-Dinitro-2-methylphenol	SVOA	360	U	360	360	U	360	360	U	360	330	U	330
4-Bromophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	19	U	19
4-Chloro-3-methylphenol	SVOA	71	U	71	72	U	72	71	U	71	66	U	66
4-Chloroaniline	SVOA	89	U	89	90	U	90	88	U	88	82	U	82
4-Chlorophenylphenyl ether	SVOA	23	U	23	23	U	23	23	U	23	21	U	21
4-Nitroaniline	SVOA	78	U	78	80	U	80	78	U	78	72	U	72
4-Nitrophenol	SVOA	110	U	110	110	U	110	100	U	100	97	U	97
Acenaphthene	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
Acenaphthylene	SVOA	18	U	18	19	U	19	18	U	18	17	U	17
Anthracene	SVOA	18	U	18	19	U	19	18	U	18	17	U	17
Benzo(a)anthracene	SVOA	22	U	22	22	U	22	22	U	22	20	U	20
Benzo(a)pyrene	SVOA	22	U	22	22	U	22	22	U	22	20	U	20
Benzo(b)fluoranthene	SVOA	28	U	28	29	U	29	28	U	28	26	U	26
Benzo(ghi)perylene	SVOA	17	U	17	18	U	18	17	U	17	16	U	16
Benzo(k)fluoranthene	SVOA	43	U	43	44	U	44	43	U	43	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	25	U	25	25	U	25	25	U	25	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	25	U	25	25	U	25	25	U	25	23	U	23
Bis(2-chloroethyl) ether	SVOA	18	U	18	18	U	18	18	U	18	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	92	JB	50	93	JB	50	91	JB	50	86	JB	46
Butylbenzylphthalate	SVOA	47	U	47	47	U	47	46	U	46	43	U	43
Carbazole	SVOA	39	U	39	39	U	39	39	U	39	36	U	36
Chrysene	SVOA	29	U	29	30	U	30	29	U	29	27	U	27
Di-n-butylphthalate	SVOA	31	U	31	32	U	32	31	U	31	29	U	29
Di-n-octylphthalate	SVOA	16	U	16	16	U	16	16	U	16	14	U	14
Dibenz[a,h]anthracene	SVOA	21	U	21	21	U	21	21	U	21	19	U	19
Dibenzofuran	SVOA	22	U	22	22	U	22	22	U	22	20	U	20
Diethyl phthalate	SVOA	28	U	28	29	U	29	28	U	28	26	U	26
Dimethyl phthalate	SVOA	230	JB	25	25	U	25	370	B	25	68	JB	23
Fluoranthene	SVOA	39	U	39	39	U	39	39	U	39	36	U	36
Fluorene	SVOA	19	U	19	20	U	20	19	U	19	18	U	18
Hexachlorobenzene	SVOA	31	U	31	32	U	32	31	U	31	29	U	29
Hexachlorobutadiene	SVOA	11	U	11	11	U	11	11	U	11	10	U	10
Hexachlorocyclopentadiene	SVOA	54	U	54	55	U	55	54	U	54	50	U	50
Hexachloroethane	SVOA	23	U	23	23	U	23	23	U	23	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	24	U	24	24	U	24	24	U	24	22	U	22
Isophorone	SVOA	18	U	18	19	U	19	18	U	18	17	U	17
N-Nitroso-di-n-dipropylamine	SVOA	34	U	34	34	U	34	33	U	33	31	U	31
N-Nitrosodiphenylamine	SVOA	23	U	23	23	U	23	23	U	23	21	U	21
Naphthalene	SVOA	34	U	34	34	U	34	33	U	33	31	U	31
Nitrobenzene	SVOA	24	U	24	24	U	24	24	U	24	22	U	22
Pentachlorophenol	SVOA	360	U	360	360	U	360	360	U	360	330	U	330
Phenanthrene	SVOA	18	U	18	19	U	19	18	U	18	17	U	17
Phenol	SVOA	19	U	19	50	J	20	19	U	19	18	U	18
Pyrene	SVOA	13	U	13	13	U	13	13	U	13	12	U	12

Attachment	1	Sheet No.	21 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (SVOAs).

CONSTITUENT	CLASS	J1N3W5, C-12			J1N019, Equipment Blank		
		2/1/2012			12/13/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	26	U	26
1,2-Dichlorobenzene	SVOA	22	U	22	20	U	20
1,3-Dichlorobenzene	SVOA	12	U	12	11	U	11
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13
2,4,5-Trichlorophenol	SVOA	10	U	10	9.2	U	9.2
2,4,6-Trichlorophenol	SVOA	10	U	10	9.2	U	9.2
2,4-Dichlorophenol	SVOA	10	U	10	9.2	U	9.2
2,4-Dimethylphenol	SVOA	66	U	66	61	U	61
2,4-Dinitrophenol	SVOA	340	U	340	310	U	310
2,4-Dinitrotoluene	SVOA	66	U	66	61	U	61
2,6-Dinitrotoluene	SVOA	28	U	28	26	U	26
2-Chloronaphthalene	SVOA	10	U	10	9.2	U	9.2
2-Chlorophenol	SVOA	21	U	21	19	U	19
2-Methylnaphthalene	SVOA	19	U	19	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	12	U	12
2-Nitroaniline	SVOA	50	U	50	46	U	46
2-Nitrophenol	SVOA	10	U	10	9.2	U	9.2
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	30	U	30
3,3'-Dichlorobenzidine	SVOA	91	U	91	83	U	83
3-Nitroaniline	SVOA	74	U	74	67	U	67
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	300	U	300
4-Bromophenylphenyl ether	SVOA	19	U	19	18	U	18
4-Chloro-3-methylphenol	SVOA	66	U	66	61	U	61
4-Chloroaniline	SVOA	83	U	83	76	U	76
4-Chlorophenylphenyl ether	SVOA	21	U	21	19	U	19
4-Nitroaniline	SVOA	73	U	73	67	U	67
4-Nitrophenol	SVOA	98	U	98	90	U	90
Acenaphthene	SVOA	10	U	10	9.5	U	9.5
Acenaphthylene	SVOA	17	U	17	16	U	16
Anthracene	SVOA	17	U	17	16	U	16
Benzo(a)anthracene	SVOA	140	J	20	18	U	18
Benzo(a)pyrene	SVOA	95	J	20	18	U	18
Benzo(b)fluoranthene	SVOA	200	JK	26	24	U	24
Benzo(ghi)perylene	SVOA	51	J	16	15	U	15
Benzo(k)fluoranthene	SVOA	40	UK	40	37	U	37
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	21	U	21
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	21	U	21
Bis(2-chloroethyl) ether	SVOA	17	U	17	15	U	15
Bis(2-ethylhexyl) phthalate	SVOA	85	JB	46	42	U	42
Butylbenzylphthalate	SVOA	43	U	43	40	U	40
Carbazole	SVOA	36	U	36	33	U	33
Chrysene	SVOA	130	J	27	25	U	25
Di-n-butylphthalate	SVOA	29	U	29	27	U	27
Di-n-octylphthalate	SVOA	15	U	15	13	U	13
Dibenz[a,h]anthracene	SVOA	19	U	19	18	U	18
Dibenzofuran	SVOA	20	U	20	18	U	18
Diethyl phthalate	SVOA	26	U	26	24	U	24
Dimethyl phthalate	SVOA	23	U	23	110	JB	21
Fluoranthene	SVOA	270	J	36	33	U	33
Fluorene	SVOA	18	U	18	17	U	17
Hexachlorobenzene	SVOA	29	U	29	27	U	27
Hexachlorobutadiene	SVOA	10	U	10	9.2	U	9.2
Hexachlorocyclopentadiene	SVOA	50	U	50	46	U	46
Hexachloroethane	SVOA	21	U	21	20	U	20
Indeno(1,2,3-cd)pyrene	SVOA	43	J	22	20	U	20
Isophorone	SVOA	17	U	17	16	U	16
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	29	U	29
N-Nitrosodiphenylamine	SVOA	21	U	21	19	U	19
Naphthalene	SVOA	31	U	31	29	U	29
Nitrobenzene	SVOA	22	U	22	20	U	20
Pentachlorophenol	SVOA	330	U	330	300	U	300
Phenanthrene	SVOA	130	J	17	16	U	16
Phenol	SVOA	22	J	18	17	U	17
Pyrene	SVOA	240	J	12	11	U	11

Attachment	1	Sheet No.	22 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	L B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1MXX1, A-10			J1MXX4, Duplicate of J1MXX1			J1MXW2, A-1			J1MXW3, A-2		
		12/12/2011			12/12/2011			12/12/2011			12/12/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.8	U	9.8	9.7	U	9.7	9.5	U	9.5	9.4	U	9.4
Acenaphthylene	PAH	8.8	U	8.8	8.7	U	8.7	8.6	U	8.6	8.5	U	8.5
Anthracene	PAH	3.0	U	3.0	2.9	U	2.9	2.9	U	2.9	2.9	U	2.9
Benzo(a)anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.0	U	3.0	3.0	U	3.0
Benzo(a)pyrene	PAH	6.3	U	6.3	6.2	U	6.2	6.1	U	6.1	6.0	U	6.0
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.1	U	4.1	4.0	U	4.0	4.0	U	4.0
Benzo(ghi)perylene	PAH	7.1	U	7.1	6.9	U	6.9	6.9	U	6.9	6.8	U	6.8
Benzo(k)fluoranthene	PAH	3.9	U	3.9	3.8	U	3.8	3.8	U	3.8	3.7	U	3.7
Chrysene	PAH	4.7	U	4.7	4.7	U	4.7	4.6	U	4.6	4.6	U	4.6
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	10	U	10	10	U	10
Fluoranthene	PAH	13	U	13	13	U	13	12	U	12	12	U	12
Fluorene	PAH	5.2	U	5.2	5.1	U	5.1	5.0	U	5.0	5.0	U	5.0
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Naphthalene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Phenanthrene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Pyrene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Aroclor-1016	PCB	2.7	U	2.7	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7
Aroclor-1221	PCB	7.7	U	7.7	8.1	U	8.1	7.7	U	7.7	7.9	U	7.9
Aroclor-1232	PCB	1.9	U	1.9	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0
Aroclor-1242	PCB	4.5	U	4.5	4.7	U	4.7	4.5	U	4.5	4.6	U	4.6
Aroclor-1248	PCB	4.5	U	4.5	4.7	U	4.7	4.5	U	4.5	4.6	U	4.6
Aroclor-1254	PCB	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aroclor-1260	PCB	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aldrin	PEST	0.24	U	0.24	0.25	U	0.25	0.24	U	0.24	0.24	U	0.24
Alpha-BHC	PEST	0.21	U	0.21	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21
alpha-Chlordane	PEST	0.31	U	0.31	0.33	U	0.33	0.31	U	0.31	0.31	U	0.31
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.64	U	0.64	0.67	U	0.67	0.65	U	0.65	0.64	U	0.64
Delta-BHC	PEST	0.38	U	0.38	0.41	U	0.41	0.39	U	0.39	0.39	U	0.39
Dichlorodiphenyldichloroethane	PEST	0.52	U	0.52	0.55	U	0.55	0.53	U	0.53	0.53	U	0.53
Dichlorodiphenyldichloroethylene	PEST	0.23	U	0.23	0.24	U	0.24	0.23	U	0.23	0.23	U	0.23
Dichlorodiphenyltrichloroethane	PEST	0.57	U	0.57	0.60	U	0.60	0.57	U	0.57	0.57	U	0.57
Dieldrin	PEST	0.20	U	0.20	0.21	U	0.21	0.20	U	0.20	0.20	U	0.2
Endosulfan I	PEST	0.17	U	0.17	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17
Endosulfan II	PEST	0.28	U	0.28	0.29	U	0.29	0.28	U	0.28	0.28	U	0.28
Endosulfan sulfate	PEST	0.26	U	0.26	0.28	U	0.28	0.27	U	0.27	0.27	U	0.27
Endrin	PEST	0.29	U	0.29	0.31	U	0.31	0.30	U	0.30	0.29	U	0.29
Endrin aldehyde	PEST	0.16	UJ	0.16	0.17	UJ	0.17	0.17	UJ	0.17	0.16	UJ	0.16
Endrin ketone	PEST	0.47	U	0.47	0.49	U	0.49	0.48	U	0.48	0.47	U	0.47
Gamma-BHC (Lindane)	PEST	0.45	U	0.45	0.47	U	0.47	0.45	U	0.45	0.45	U	0.45
gamma-Chlordane	PEST	0.26	U	0.26	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26
Heptachlor	PEST	0.21	U	0.21	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21
Heptachlor epoxide	PEST	0.41	U	0.41	0.43	U	0.43	0.41	U	0.41	0.41	U	0.41
Methoxychlor	PEST	0.43	U	0.43	0.46	U	0.46	0.44	U	0.44	0.43	U	0.43
Toxaphene	PEST	15	UJ	15	16	UJ	16	15	UJ	15	15	UJ	15

Attachment	1	Sheet No.	23 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1MXW4, A-3 12/12/2011			J1MXW5, A-4 12/12/2011			J1MXW6, A-5 12/12/2011			J1MXW7, A-6 12/12/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.8	U	9.8	9.6	U	9.6	9.6	U	9.6	9.6	U	9.6
Acenaphthylene	PAH	8.8	U	8.8	8.6	U	8.6	8.7	U	8.7	8.7	U	8.7
Anthracene	PAH	3.0	U	3.0	2.9	U	2.9	2.9	U	2.9	2.9	U	2.9
Benzo(a)anthracene	PAH	3.1	U	3.1	3.0	U	3.0	3.1	U	3.1	3.1	U	3.1
Benzo(a)pyrene	PAH	6.3	U	6.3	6.1	U	6.1	6.2	U	6.2	6.2	U	6.2
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.0	U	4.0	4.1	U	4.1	4.0	U	4.0
Benzo(ghi)perylene	PAH	7.0	U	7.0	6.9	U	6.9	6.9	U	6.9	6.9	U	6.9
Benzo(k)fluoranthene	PAH	3.8	U	3.8	3.8	U	3.8	3.8	U	3.8	3.8	U	3.8
Chrysene	PAH	4.7	U	4.7	4.6	U	4.6	4.7	U	4.7	4.7	U	4.7
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	12	U	12	13	U	13	13	U	13
Fluorene	PAH	5.1	U	5.1	5.0	U	5.0	5.1	U	5.1	5.1	U	5.1
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	11	U	11	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	11	U	11	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	11	U	11	12	U	12	12	U	12
Pyrene	PAH	12	U	12	11	U	11	12	U	12	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Aroclor-1221	PCB	8.0	U	8.0	7.8	U	7.8	7.8	U	7.8	7.8	U	7.8
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	4.5	U	4.5	4.5	U	4.5	4.5	U	4.5
Aroclor-1248	PCB	4.7	U	4.7	4.5	U	4.5	4.5	U	4.5	4.5	U	4.5
Aroclor-1254	PCB	2.6	U	2.6	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5
Aroclor-1260	PCB	2.6	U	2.6	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5
Aldrin	PEST	0.26	U	0.26	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25
Alpha-BHC	PEST	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
alpha-Chlordane	PEST	0.33	U	0.33	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.68	U	0.68	0.65	U	0.65	0.67	U	0.67	0.66	U	0.66
Delta-BHC	PEST	0.41	U	0.41	0.39	U	0.39	0.40	U	0.40	0.40	U	0.40
Dichlorodiphenyldichloroethane	PEST	0.56	U	0.56	0.54	U	0.54	0.55	U	0.55	0.55	U	0.55
Dichlorodiphenyldichloroethylene	PEST	0.24	U	0.24	0.23	U	0.23	0.24	U	0.24	0.24	U	0.24
Dichlorodiphenyltrichloroethane	PEST	0.60	U	0.60	0.58	U	0.58	0.59	U	0.59	0.59	U	0.59
Dieldrin	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
Endosulfan I	PEST	0.18	U	0.18	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18
Endosulfan II	PEST	0.29	U	0.29	0.28	U	0.28	0.29	U	0.29	0.29	U	0.29
Endosulfan sulfate	PEST	0.28	U	0.28	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28
Endrin	PEST	0.31	U	0.31	0.30	U	0.30	0.31	U	0.31	0.31	U	0.31
Endrin aldehyde	PEST	0.18	UNJ	0.18	0.17	UJ	0.17	0.17	UJ	0.17	0.17	UJ	0.17
Endrin ketone	PEST	0.50	U	0.50	0.48	U	0.48	0.49	U	0.49	0.49	U	0.49
Gamma-BHC (Lindane)	PEST	0.48	U	0.48	0.46	U	0.46	0.46	U	0.46	0.46	U	0.46
gamma-Chlordane	PEST	0.27	U	0.27	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27
Heptachlor	PEST	0.22	U	0.22	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
Heptachlor epoxide	PEST	0.44	U	0.44	0.42	U	0.42	0.43	U	0.43	0.43	U	0.43
Methoxychlor	PEST	0.46	U	0.46	0.44	U	0.44	0.45	U	0.45	0.45	U	0.45
Toxaphene	PEST	16	UJ	16	16	UJ	16	16	UJ	16	16	UJ	16

Attachment	1	Sheet No.	24 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1, 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1MXW8, A-7 12/12/2011			J1MXW9, A-8 12/12/2011			J1MXX0, A-9 12/12/2011			J1MXX2, A-11 12/12/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.8	U	9.8	9.8	U	9.8	9.8	U	9.8	9.9	U	9.9
Acenaphthylene	PAH	8.8	U	8.8	8.8	U	8.8	8.8	U	8.8	8.9	U	8.9
Anthracene	PAH	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0
Benzo(a)anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2
Benzo(a)pyrene	PAH	6.3	U	6.3	6.3	U	6.3	6.3	U	6.3	6.4	U	6.4
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.1	U	4.1	4.1	U	4.1	4.2	U	4.2
Benzo(ghi)perylene	PAH	7.1	U	7.1	7.1	U	7.1	7.1	U	7.1	7.1	U	7.1
Benzo(k)fluoranthene	PAH	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9
Chrysene	PAH	4.7	U	4.7	4.8	U	4.8	4.7	U	4.7	4.8	U	4.8
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	PAH	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
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	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	7.8	U	7.8	7.9	U	7.9
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	4.6	U	4.6
Aroclor-1248	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	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	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aldrin	PEST	0.24	U	0.24	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
alpha-Chlordane	PEST	0.31	U	0.31	0.32	U	0.32	0.33	U	0.33	0.32	U	0.32
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.64	U	0.64	0.66	U	0.66	0.67	U	0.67	0.67	U	0.67
Delta-BHC	PEST	0.39	U	0.39	0.40	U	0.40	0.41	U	0.41	0.40	U	0.40
Dichlorodiphenyldichloroethane	PEST	0.53	U	0.53	0.54	U	0.54	0.55	U	0.55	0.55	U	0.55
Dichlorodiphenyldichloroethylene	PEST	0.23	U	0.23	0.24	U	0.24	0.24	U	0.24	0.24	U	0.24
Dichlorodiphenyltrichloroethane	PEST	0.57	U	0.57	0.59	U	0.59	0.60	U	0.60	0.59	U	0.59
Dieldrin	PEST	0.20	U	0.20	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
Endosulfan I	PEST	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18
Endosulfan II	PEST	0.28	U	0.28	0.28	U	0.28	0.29	U	0.29	0.29	U	0.29
Endosulfan sulfate	PEST	0.27	U	0.27	0.27	U	0.27	0.28	U	0.28	0.28	U	0.28
Endrin	PEST	0.30	U	0.30	0.30	U	0.30	0.31	U	0.31	0.31	U	0.31
Endrin aldehyde	PEST	0.17	UJ	0.17	0.17	UJ	0.17	0.17	UJ	0.17	0.17	UJ	0.17
Endrin ketone	PEST	0.47	U	0.47	0.49	U	0.49	0.50	U	0.50	0.49	U	0.49
Gamma-BHC (Lindane)	PEST	0.45	U	0.45	0.46	U	0.46	0.47	U	0.47	0.47	U	0.47
gamma-Chlordane	PEST	0.26	U	0.26	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
Heptachlor epoxide	PEST	0.41	U	0.41	0.42	U	0.42	0.43	U	0.43	0.43	U	0.43
Methoxychlor	PEST	0.44	U	0.44	0.45	U	0.45	0.46	U	0.46	0.45	U	0.45
Toxaphene	PEST	15	UJ	15	16	UJ	16	16	UJ	16	16	UJ	16

Attachment	1	Sheet No.	25 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1MXX3, A-12			J1N015, B-10			J1N018, Duplicate of J1N015			J1N006, B-1		
		12/12/2011			12/13/2011			1/0/1900			12/13/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	9.5	U	9.5	9.6	U	9.6
Acenaphthylene	PAH	9.2	U	9.2	9.0	U	9.0	8.5	U	8.5	8.6	U	8.6
Anthracene	PAH	3.1	U	3.1	3.0	U	3.0	2.9	U	2.9	2.9	U	2.9
Benzo(a)anthracene	PAH	3.3	U	3.3	3.2	U	3.2	3.0	U	3.0	3.1	U	3.1
Benzo(a)pyrene	PAH	6.6	U	6.6	6.4	U	6.4	6.1	U	6.1	6.1	U	6.1
Benzo(b)fluoranthene	PAH	4.3	U	4.3	4.2	U	4.2	4.0	U	4.0	4.0	U	4.0
Benzo(ghi)perylene	PAH	7.4	U	7.4	7.2	U	7.2	6.8	U	6.8	6.9	U	6.9
Benzo(k)fluoranthene	PAH	4.0	U	4.0	3.9	U	3.9	3.7	U	3.7	3.8	U	3.8
Chrysene	PAH	5.0	U	5.0	4.8	U	4.8	4.6	U	4.6	4.6	U	4.6
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	10	U	10	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	12	U	12	12	U	12
Fluorene	PAH	5.4	U	5.4	5.3	U	5.3	5.0	U	5.0	5.1	U	5.1
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Naphthalene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Phenanthrene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Pyrene	PAH	12	U	12	12	U	12	11	U	11	11	U	11
Aroclor-1016	PCB	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
Aroclor-1221	PCB	7.6	U	7.6	7.7	U	7.7	7.8	U	7.8	7.6	U	7.6
Aroclor-1232	PCB	1.9	U	1.9	1.9	U	1.9	1.9	U	1.9	1.9	U	1.9
Aroclor-1242	PCB	4.4	U	4.4	4.5	U	4.5	4.5	U	4.5	4.4	U	4.4
Aroclor-1248	PCB	4.4	U	4.4	4.5	U	4.5	4.5	U	4.5	4.4	U	4.4
Aroclor-1254	PCB	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5
Aroclor-1260	PCB	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5
Aldrin	PEST	0.25	U	0.25	0.25	U	0.25	0.25	U	0.25	0.24	U	0.24
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
alpha-Chlordane	PEST	0.32	U	0.32	0.32	U	0.32	0.32	U	0.32	0.31	U	0.31
beta-1.2.3.4.5,6-Hexachlorocyclohexane	PEST	0.67	U	0.67	0.66	U	0.66	0.65	U	0.65	0.64	U	0.64
Delta-BHC	PEST	0.40	U	0.40	0.40	U	0.40	0.40	U	0.40	0.39	U	0.39
Dichlorodiphenyldichloroethane	PEST	0.55	U	0.55	0.54	U	0.54	0.54	U	0.54	0.53	U	0.53
Dichlorodiphenyldichloroethylene	PEST	0.24	U	0.24	0.24	U	0.24	0.23	U	0.23	0.23	U	0.23
Dichlorodiphenyltrichloroethane	PEST	0.59	U	0.59	0.58	U	0.58	0.58	U	0.58	0.57	U	0.57
Dieldrin	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.20	U	0.20
Endosulfan I	PEST	0.18	U	0.18	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17
Endosulfan II	PEST	0.29	U	0.29	0.28	U	0.28	0.28	U	0.28	0.28	U	0.28
Endosulfan sulfate	PEST	0.28	U	0.28	0.27	UN	0.27	0.27	U	0.27	0.27	U	0.27
Endrin	PEST	0.31	U	0.31	0.30	U	0.30	0.30	U	0.30	0.29	U	0.29
Endrin aldehyde	PEST	0.17	UJ	0.17	0.17	U	0.17	0.17	U	0.17	0.16	U	0.16
Endrin ketone	PEST	0.49	U	0.49	0.48	U	0.48	0.48	U	0.48	0.47	U	0.47
Gamma-BHC (Lindane)	PEST	0.47	U	0.47	0.46	U	0.46	0.46	U	0.46	0.45	U	0.45
gamma-Chlordane	PEST	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26	0.26	U	0.26
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21	0.21	U	0.21
Heptachlor epoxide	PEST	0.43	U	0.43	0.42	U	0.42	0.42	U	0.42	0.41	U	0.41
Methoxychlor	PEST	0.45	U	0.45	0.44	U	0.44	0.44	U	0.44	0.43	U	0.43
Toxaphene	PEST	16	UJ	16	16	U	16	16	U	16	15	U	15

Attachment	1	Sheet No.	26 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1N007, B-2 12/13/2011			J1N008, B-3 12/13/2011			J1N009, B-4 12/13/2011			J1N010, B-5 12/13/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.6	U	9.6	10	U	10	9.6	U	9.6	12	U	12
Acenaphthylene	PAH	8.6	U	8.6	9.2	U	9.2	8.7	U	8.7	11	U	11
Anthracene	PAH	2.9	U	2.9	3.1	U	3.1	2.9	U	2.9	3.7	U	3.7
Benzo(a)anthracene	PAH	3.1	U	3.1	3.3	U	3.3	3.1	U	3.1	3.9	U	3.9
Benzo(a)pyrene	PAH	6.1	U	6.1	6.5	U	6.5	6.2	U	6.2	7.8	U	7.8
Benzo(b)fluoranthene	PAH	4.0	U	4.0	4.3	U	4.3	4.0	U	4.0	5.1	U	5.1
Benzo(ghi)perylene	PAH	6.9	U	6.9	7.4	U	7.4	6.9	U	6.9	8.8	U	8.8
Benzo(k)fluoranthene	PAH	3.8	U	3.8	4.0	U	4.0	3.8	U	3.8	4.8	U	4.8
Chrysene	PAH	4.6	U	4.6	4.9	U	4.9	4.7	U	4.7	5.9	U	5.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	13	U	13
Fluoranthene	PAH	12	U	12	13	U	13	13	U	13	16	U	16
Fluorene	PAH	5.1	U	5.1	5.4	U	5.4	5.1	U	5.1	6.4	U	6.4
Indeno(1,2,3-cd)pyrene	PAH	11	U	11	12	U	12	12	U	12	15	U	15
Naphthalene	PAH	11	U	11	12	U	12	12	U	12	15	U	15
Phenanthrene	PAH	11	U	11	12	U	12	12	U	12	15	U	15
Pyrene	PAH	11	U	11	12	U	12	12	U	12	15	U	15
Aroclor-1016	PCB	2.7	U	2.7	2.9	U	2.9	2.7	U	2.7	3.4	U	3.4
Aroclor-1221	PCB	7.8	U	7.8	8.3	U	8.3	7.8	U	7.8	9.7	U	9.7
Aroclor-1232	PCB	2.0	U	2.0	2.1	U	2.1	1.9	U	1.9	2.4	U	2.4
Aroclor-1242	PCB	4.5	U	4.5	4.8	U	4.8	4.5	U	4.5	5.6	U	5.6
Aroclor-1248	PCB	4.5	U	4.5	4.8	U	4.8	4.5	U	4.5	5.6	U	5.6
Aroclor-1254	PCB	2.5	U	2.5	2.7	U	2.7	2.5	U	2.5	3.1	U	3.1
Aroclor-1260	PCB	2.5	U	2.5	2.7	U	2.7	2.5	U	2.5	3.1	U	3.1
Aldrin	PEST	0.24	U	0.24	0.26	U	0.26	0.24	U	0.24	0.31	U	0.31
Alpha-BHC	PEST	0.21	U	0.21	0.23	U	0.23	0.20	U	0.20	0.26	U	0.26
alpha-Chlordane	PEST	0.31	U	0.31	0.34	U	0.34	0.30	U	0.30	0.39	U	0.39
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.64	U	0.64	0.70	U	0.70	0.62	U	0.62	0.81	U	0.81
Delta-BHC	PEST	0.39	U	0.39	0.42	U	0.42	0.38	U	0.38	0.49	U	0.49
Dichlorodiphenyldichloroethane	PEST	0.53	U	0.53	0.58	U	0.58	0.51	U	0.51	0.67	U	0.67
Dichlorodiphenyldichloroethylene	PEST	0.23	U	0.23	0.25	U	0.25	0.22	U	0.22	0.29	U	0.29
Dichlorodiphenyltrichloroethane	PEST	0.57	U	0.57	0.62	U	0.62	0.55	U	0.55	0.72	U	0.72
Dieldrin	PEST	0.20	U	0.20	0.22	U	0.22	0.20	U	0.20	0.26	U	0.26
Endosulfan I	PEST	0.17	U	0.17	0.19	U	0.19	0.16	U	0.16	0.21	U	0.21
Endosulfan II	PEST	0.28	U	0.28	0.30	U	0.30	0.27	U	0.27	0.35	U	0.35
Endosulfan sulfate	PEST	0.27	U	0.27	0.29	U	0.29	0.26	U	0.26	0.34	U	0.34
Endrin	PEST	0.30	U	0.30	0.32	U	0.32	0.29	U	0.29	0.37	U	0.37
Endrin aldehyde	PEST	0.17	U	0.17	0.18	U	0.18	0.16	U	0.16	0.21	U	0.21
Endrin ketone	PEST	0.47	U	0.47	0.52	U	0.52	0.46	U	0.46	0.60	U	0.60
Gamma-BHC (Lindane)	PEST	0.45	U	0.45	0.49	U	0.49	0.43	U	0.43	0.57	U	0.57
gamma-Chlordane	PEST	0.26	U	0.26	0.28	U	0.28	0.25	U	0.25	0.32	U	0.32
Heptachlor	PEST	0.21	U	0.21	0.23	U	0.23	0.20	U	0.20	0.26	U	0.26
Heptachlor epoxide	PEST	0.41	U	0.41	0.45	U	0.45	0.40	U	0.40	0.52	U	0.52
Methoxychlor	PEST	0.43	U	0.43	0.47	U	0.47	0.42	U	0.42	0.55	U	0.55
Toxaphene	PEST	15	U	15	17	U	17	15	U	15	19	U	19

Attachment	1	Sheet No.	27 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1N011, B-6 12/13/2011			J1N012, B-7 12/13/2011			J1N013, B-8 12/13/2011			J1N014, B-9 12/13/2011		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.4	U	9.4	9.7	U	9.7	9.5	U	9.5	10	U	10
Acenaphthylene	PAH	8.5	U	8.5	8.7	U	8.7	8.5	U	8.5	9.2	U	9.2
Anthracene	PAH	2.9	U	2.9	3.0	U	3.0	2.9	U	2.9	3.1	U	3.1
Benzo(a)anthracene	PAH	3.0	U	3.0	3.1	U	3.1	3.0	U	3.0	3.3	U	3.3
Benzo(a)pyrene	PAH	6.0	U	6.0	6.2	U	6.2	6.1	U	6.1	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.0	U	4.0	4.1	U	4.1	4.0	U	4.0	4.3	U	4.3
Benzo(ghi)perylene	PAH	6.8	U	6.8	7.0	U	7.0	6.8	U	6.8	7.3	U	7.3
Benzo(k)fluoranthene	PAH	3.7	U	3.7	3.8	U	3.8	3.7	U	3.7	4.0	U	4.0
Chrysene	PAH	4.6	U	4.6	4.7	U	4.7	4.6	U	4.6	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	10	U	10	11	U	11	10	U	10	11	U	11
Fluoranthene	PAH	12	U	12	13	U	13	12	U	12	13	U	13
Fluorene	PAH	5.0	U	5.0	5.1	U	5.1	5.0	U	5.0	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	11	U	11	12	U	12	11	U	11	12	U	12
Naphthalene	PAH	11	U	11	12	U	12	11	U	11	12	U	12
Phenanthrene	PAH	11	U	11	12	U	12	11	U	11	12	U	12
Pyrene	PAH	11	U	11	12	U	12	11	U	11	12	U	12
Aroclor-1016	PCB	2.6	U	2.6	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7
Aroclor-1221	PCB	7.5	U	7.5	8.0	U	8.0	7.5	U	7.5	7.7	U	7.7
Aroclor-1232	PCB	1.9	U	1.9	2.0	U	2.0	1.9	U	1.9	1.9	U	1.9
Aroclor-1242	PCB	4.4	U	4.4	4.6	U	4.6	4.3	U	4.3	4.5	U	4.5
Aroclor-1248	PCB	4.4	U	4.4	4.6	U	4.6	4.3	U	4.3	4.5	U	4.5
Aroclor-1254	PCB	2.4	U	2.4	2.6	U	2.6	2.4	U	2.4	2.5	U	2.5
Aroclor-1260	PCB	2.4	U	2.4	2.6	U	2.6	2.4	U	2.4	2.5	U	2.5
Aldrin	PEST	0.24	U	0.24	0.25	U	0.25	0.24	U	0.24	0.25	U	0.25
Alpha-BHC	PEST	0.20	U	0.20	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21
alpha-Chlordane	PEST	0.30	U	0.30	0.32	U	0.32	0.30	U	0.30	0.32	U	0.32
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.62	U	0.62	0.66	U	0.66	0.63	U	0.63	0.66	U	0.66
Delta-BHC	PEST	0.38	U	0.38	0.40	U	0.40	0.38	U	0.38	0.40	U	0.40
Dichlorodiphenyldichloroethane	PEST	0.51	U	0.51	0.54	U	0.54	0.51	U	0.51	0.55	U	0.55
Dichlorodiphenyldichloroethylene	PEST	0.22	U	0.22	0.23	U	0.23	0.22	U	0.22	0.32	J	0.24
Dichlorodiphenyltrichloroethane	PEST	0.55	U	0.55	0.58	U	0.58	0.56	U	0.56	0.59	U	0.59
Dieldrin	PEST	0.20	U	0.20	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21
Endosulfan I	PEST	0.17	U	0.17	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18
Endosulfan II	PEST	0.27	U	0.27	0.28	U	0.28	0.27	U	0.27	0.29	U	0.29
Endosulfan sulfate	PEST	0.26	U	0.26	0.27	U	0.27	0.26	U	0.26	0.28	U	0.28
Endrin	PEST	0.29	U	0.29	0.30	U	0.30	0.29	U	0.29	0.31	U	0.31
Endrin aldehyde	PEST	0.16	U	0.16	0.17	U	0.17	0.16	U	0.16	0.17	U	0.17
Endrin ketone	PEST	0.46	U	0.46	0.48	U	0.48	0.46	U	0.46	0.49	U	0.49
Gamma-BHC (Lindane)	PEST	0.44	U	0.44	0.46	U	0.46	0.44	U	0.44	0.46	U	0.46
gamma-Chlordane	PEST	0.25	U	0.25	0.26	U	0.26	0.25	U	0.25	0.27	U	0.27
Heptachlor	PEST	0.20	U	0.20	0.21	U	0.21	0.20	U	0.20	0.21	U	0.21
Heptachlor epoxide	PEST	0.40	U	0.40	0.42	U	0.42	0.40	U	0.40	0.43	U	0.43
Methoxychlor	PEST	0.42	U	0.42	0.44	U	0.44	0.42	U	0.42	0.45	U	0.45
Toxaphene	PEST	15	U	15	16	U	16	15	U	15	16	U	16

Attachment	1	Sheet No.	28 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1N016, B-11			J1N017, B-12			J1N3V9, C-6			J1N3W6, Duplicate of J1N3V9		
		12/13/2011			12/13/2011			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.6	U	9.6	9.7	U	9.7	10	U	10	10	U	10
Acenaphthylene	PAH	8.6	U	8.6	8.7	U	8.7	9.1	U	9.1	9.1	U	9.1
Anthracene	PAH	2.9	U	2.9	2.9	U	2.9	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2	3.2	U	3.2
Benzo(a)pyrene	PAH	6.2	U	6.2	6.2	U	6.2	6.5	U	6.5	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.0	U	4.0	4.1	U	4.1	4.2	U	4.2	4.2	U	4.2
Benzo(ghi)perylene	PAH	6.9	U	6.9	7.0	U	7.0	7.3	U	7.3	7.3	U	7.3
Benzo(k)fluoranthene	PAH	3.8	U	3.8	3.8	U	3.8	4.0	U	4.0	4.0	U	4.0
Chrysene	PAH	4.6	U	4.6	4.7	U	4.7	4.9	U	4.9	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	12	U	12	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.1	U	5.1	5.1	U	5.1	5.3	U	5.3	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	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
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.7	U	2.7	2.8	U	2.8	3.0	U	3.0	3.0	U	3.0
Aroclor-1221	PCB	7.9	U	7.9	8.0	U	8.0	8.8	U	8.8	8.6	U	8.6
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	2.2	U	2.2	2.1	U	2.1
Aroclor-1242	PCB	4.6	U	4.6	4.6	U	4.6	5.1	U	5.1	5.0	U	5.0
Aroclor-1248	PCB	4.6	U	4.6	4.6	U	4.6	5.1	U	5.1	5.0	U	5.0
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.9	U	2.9	2.8	U	2.8
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.9	U	2.9	2.8	U	2.8
Aldrin	PEST	0.25	U	0.25	0.25	U	0.25	0.27	U	0.27	0.27	U	0.27
Alpha-BHC	PEST	0.21	U	0.21	0.21	U	0.21	0.23	U	0.23	0.23	U	0.23
alpha-Chlordane	PEST	0.32	U	0.32	0.32	U	0.32	0.35	U	0.35	0.34	U	0.34
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.65	U	0.65	0.65	U	0.65	0.71	U	0.71	0.71	U	0.71
Delta-BHC	PEST	0.39	U	0.39	0.39	U	0.39	0.43	U	0.43	0.43	U	0.43
Dichlorodiphenyldichloroethane	PEST	0.53	U	0.53	0.53	U	0.53	0.58	U	0.58	0.58	U	0.58
Dichlorodiphenyldichloroethylene	PEST	0.23	U	0.23	0.23	U	0.23	0.25	U	0.25	0.25	U	0.25
Dichlorodiphenyltrichloroethane	PEST	0.58	U	0.58	0.58	U	0.58	0.63	U	0.63	0.63	U	0.63
Dieldrin	PEST	0.21	U	0.21	0.21	U	0.21	0.22	U	0.22	0.22	U	0.22
Endosulfan I	PEST	0.17	U	0.17	0.17	U	0.17	0.19	U	0.19	0.19	U	0.19
Endosulfan II	PEST	0.28	U	0.28	0.28	U	0.28	0.31	U	0.31	0.30	U	0.30
Endosulfan sulfate	PEST	0.27	U	0.27	0.27	U	0.27	0.30	U	0.30	0.29	U	0.29
Endrin	PEST	0.30	U	0.30	0.30	U	0.30	0.33	U	0.33	0.33	U	0.33
Endrin aldehyde	PEST	0.17	U	0.17	0.17	U	0.17	0.18	U	0.18	0.18	U	0.18
Endrin ketone	PEST	0.48	U	0.48	0.48	U	0.48	0.52	U	0.52	0.52	U	0.52
Gamma-BHC (Lindane)	PEST	0.45	U	0.45	0.45	U	0.45	0.50	U	0.50	0.49	U	0.49
gamma-Chlordane	PEST	0.26	U	0.26	0.26	U	0.26	0.28	U	0.28	0.28	U	0.28
Heptachlor	PEST	0.21	U	0.21	0.21	U	0.21	0.23	U	0.23	0.23	U	0.23
Heptachlor epoxide	PEST	0.42	U	0.42	0.42	U	0.42	0.46	U	0.46	0.45	U	0.45
Methoxychlor	PEST	0.44	U	0.44	0.44	U	0.44	0.48	U	0.48	0.48	U	0.48
Toxaphene	PEST	15	U	15	15	U	15	17	U	17	17	U	17

Attachment	1	Sheet No.	29 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1N3V4, C-1			J1NLP4, C-1 resample[a]			J1N3V5, C-2			J1N3V6, C-3		
		2/1/2012			3/12/12 10:05			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	11	U	11	10	U	10
Acenaphthylene	PAH	9.3	U	9.3	9.4	U	9.4	10	U	10	9.1	U	9.1
Anthracene	PAH	3.1	U	3.1	3.2	U	3.2	3.4	U	3.4	3.1	U	3.1
Benzo(a)anthracene	PAH	3.3	U	3.3	3.3	UN	3.3	3.5	U	3.5	3.2	U	3.2
Benzo(a)pyrene	PAH	6.6	U	6.6	6.7	U	6.7	7.1	U	7.1	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.3	U	4.3	4.4	UN	4.4	4.7	U	4.7	4.3	U	4.3
Benzo(ghi)perylene	PAH	7.4	U	7.4	7.5	UN	7.5	8.0	U	8.0	7.3	U	7.3
Benzo(k)fluoranthene	PAH	4.1	U	4.1	4.1	UN	4.1	4.4	U	4.4	4.0	U	4.0
Chrysene	PAH	5.0	U	5.0	5.1	UN	5.1	5.4	U	5.4	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	12	U	12	12	U	12	11	U	11
Fluoranthene	PAH	13	U	13	14	U	14	14	U	14	13	U	13
Fluorene	PAH	5.4	U	5.4	5.5	U	5.5	5.9	U	5.9	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	13	UN	13	13	U	13	12	U	12
Naphthalene	PAH	12	U	12	13	UN	13	13	U	13	12	U	12
Phenanthrene	PAH	12	U	12	13	U	13	13	U	13	12	U	12
Pyrene	PAH	12	U	12	13	U	13	13	U	13	12	U	12
Aroclor-1016	PCB	3.0	U	3.0	3.0	U	3.0	2.8	U	2.8	2.9	U	2.9
Aroclor-1221	PCB	8.8	U	8.8	8.7	U	8.7	8.1	U	8.1	8.3	U	8.3
Aroclor-1232	PCB	2.2	U	2.2	2.2	U	2.2	2.0	U	2.0	2.1	U	2.1
Aroclor-1242	PCB	5.1	U	5.1	5.1	U	5.1	4.7	U	4.7	4.8	U	4.8
Aroclor-1248	PCB	5.1	U	5.1	5.1	U	5.1	4.7	U	4.7	4.8	U	4.8
Aroclor-1254	PCB	2.9	U	2.9	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7
Aroclor-1260	PCB	2.9	U	2.9	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7
Aldrin	PEST	0.26	U	0.26	0.27	U	0.27	0.27	U	0.27	0.27	U	0.27
Alpha-BHC	PEST	0.22	U	0.22	0.23	U	0.23	0.23	U	0.23	0.23	U	0.23
alpha-Chlordane	PEST	0.33	U	0.33	0.34	U	0.34	0.35	U	0.35	0.34	U	0.34
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.69	U	0.69	0.70	U	0.70	0.72	U	0.72	0.71	U	0.71
Delta-BHC	PEST	0.42	U	0.42	0.42	U	0.42	0.44	U	0.44	0.43	U	0.43
Dichlorodiphenyldichloroethane	PEST	0.57	U	0.57	0.58	U	0.58	0.59	U	0.59	0.58	U	0.58
Dichlorodiphenyldichloroethylene	PEST	0.25	U	0.25	0.26	JX	0.25	0.26	U	0.26	0.25	U	0.25
Dichlorodiphenyltrichloroethane	PEST	0.61	U	0.61	0.62	U	0.62	0.64	U	0.64	0.63	U	0.63
Dieldrin	PEST	0.22	U	0.22	0.36	JX	0.22	0.23	U	0.23	0.22	U	0.22
Endosulfan I	PEST	0.18	U	0.18	0.19	U	0.19	0.19	U	0.19	0.19	U	0.19
Endosulfan II	PEST	0.30	U	0.30	0.30	U	0.30	0.31	U	0.31	0.30	U	0.30
Endosulfan sulfate	PEST	0.29	U	0.29	0.29	U	0.29	0.30	U	0.30	0.29	U	0.29
Endrin	PEST	0.32	U	0.32	0.32	U	0.32	0.33	U	0.33	0.33	U	0.33
Endrin aldehyde	PEST	0.18	UN	0.18	0.18	UN	0.18	0.19	U	0.19	0.18	U	0.18
Endrin ketone	PEST	0.51	U	0.51	0.52	U	0.52	0.53	U	0.53	0.52	U	0.52
Gamma-BHC (Lindane)	PEST	0.48	U	0.48	0.49	U	0.49	0.50	U	0.50	0.49	U	0.49
gamma-Chlordane	PEST	0.28	U	0.28	0.28	U	0.28	0.29	U	0.29	0.28	U	0.28
Heptachlor	PEST	0.22	U	0.22	0.23	U	0.23	0.23	U	0.23	0.23	U	0.23
Heptachlor epoxide	PEST	0.44	U	0.44	0.45	U	0.45	0.46	U	0.46	0.45	U	0.45
Methoxychlor	PEST	0.47	U	0.47	0.48	U	0.48	0.49	U	0.49	0.48	U	0.48
Toxaphene	PEST	16	U	16	17	U	17	17	U	17	17	U	17

Attachment	1	Sheet No.	30 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1NLP5, C-3 resample[a]			J1N3V7, C-4			J1N3V8, C-5			J1N3W0, C-7		
		3/12/12 10:10			2/1/2012			2/1/2012			2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	10	U	10	10	U	10
Acenaphthylene	PAH	9.4	U	9.4	9.2	U	9.2	9.2	U	9.2	9.2	U	9.2
Anthracene	PAH	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.3	U	3.3	3.3	U	3.3	3.3	U	3.3	3.3	U	3.3
Benzo(a)pyrene	PAH	6.7	U	6.7	6.6	U	6.6	6.6	U	6.6	6.6	U	6.6
Benzo(b)fluoranthene	PAH	4.4	U	4.4	4.3	U	4.3	4.3	U	4.3	4.9	J	4.3
Benzo(ghi)perylene	PAH	7.5	U	7.5	7.4	U	7.4	7.4	U	7.4	7.4	U	7.4
Benzo(k)fluoranthene	PAH	4.1	U	4.1	4.0	U	4.0	4.0	U	4.0	4.0	U	4.0
Chrysene	PAH	5.1	U	5.1	5.0	U	5.0	5.0	U	5.0	5.0	U	5.0
Dibenz[a,h]anthracene	PAH	12	U	12	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	14	U	14	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.5	U	5.5	5.4	U	5.4	5.4	U	5.4	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	13	U	13	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	13	U	13	12	U	12	12	U	12	12	U	12
Pyrene	PAH	13	U	13	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	3.1	U	3.1	2.9	U	2.9	3.0	U	3.0
Aroclor-1221	PCB	8.2	U	8.2	9.0	U	9.0	8.3	U	8.3	8.8	U	8.8
Aroclor-1232	PCB	2.0	U	2.0	2.2	U	2.2	2.1	U	2.1	2.2	U	2.2
Aroclor-1242	PCB	4.8	U	4.8	5.2	U	5.2	4.8	U	4.8	5.1	U	5.1
Aroclor-1248	PCB	4.8	U	4.8	5.2	U	5.2	4.8	U	4.8	5.1	U	5.1
Aroclor-1254	PCB	2.7	U	2.7	2.9	U	2.9	2.7	U	2.7	2.9	U	2.9
Aroclor-1260	PCB	2.7	U	2.7	2.9	U	2.9	2.7	U	2.7	2.9	U	2.9
Aldrin	PEST	0.25	U	0.25	0.28	U	0.28	0.26	U	0.26	0.27	U	0.27
Alpha-BHC	PEST	0.21	U	0.21	0.24	U	0.24	0.22	U	0.22	0.23	U	0.23
alpha-Chlordane	PEST	0.32	U	0.32	0.36	U	0.36	0.33	U	0.33	0.34	U	0.34
beta-1.2.3.4.5.6-Hexachlorocyclohexane	PEST	0.67	U	0.67	0.74	U	0.74	0.69	U	0.69	0.70	U	0.70
Delta-BHC	PEST	0.40	U	0.40	0.44	U	0.44	0.42	U	0.42	0.42	U	0.42
Dichlorodiphenyldichloroethane	PEST	0.55	U	0.55	0.61	U	0.61	0.57	U	0.57	0.58	U	0.58
Dichlorodiphenyldichloroethylene	PEST	0.24	U	0.24	0.26	U	0.26	0.25	U	0.25	0.25	U	0.25
Dichlorodiphenyltrichloroethane	PEST	0.59	U	0.59	0.65	U	0.65	0.61	U	0.61	0.62	U	0.62
Dieldrin	PEST	0.21	U	0.21	0.23	U	0.23	0.22	U	0.22	0.22	U	0.22
Endosulfan I	PEST	0.18	U	0.18	0.20	U	0.20	0.18	U	0.18	0.19	U	0.19
Endosulfan II	PEST	0.29	U	0.29	0.32	U	0.32	0.30	U	0.30	0.30	U	0.30
Endosulfan sulfate	PEST	0.28	U	0.28	0.31	U	0.31	0.29	U	0.29	0.29	U	0.29
Endrin	PEST	0.31	U	0.31	0.34	U	0.34	0.32	U	0.32	0.32	U	0.32
Endrin aldehyde	PEST	0.17	U	0.17	0.19	U	0.19	0.18	U	0.18	0.18	U	0.18
Endrin ketone	PEST	0.49	U	0.49	0.54	U	0.54	0.51	U	0.51	0.52	U	0.52
Gamma-BHC (Lindane)	PEST	0.47	U	0.47	0.51	U	0.51	0.48	U	0.48	0.49	U	0.49
gamma-Chlordane	PEST	0.27	U	0.27	0.30	U	0.30	0.28	U	0.28	0.28	U	0.28
Heptachlor	PEST	0.21	U	0.21	0.24	U	0.24	0.22	U	0.22	0.23	U	0.23
Heptachlor epoxide	PEST	0.43	U	0.43	0.47	U	0.47	0.44	U	0.44	0.45	U	0.45
Methoxychlor	PEST	0.45	U	0.45	0.50	U	0.50	0.47	U	0.47	0.48	U	0.48
Toxaphene	PEST	16	U	16	18	U	18	16	U	16	17	U	17

Attachment	1	Sheet No.	31 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1N3W1, C-8 2/1/2012			J1N3W2, C-9 2/1/2012			J1N3W3, C-10 2/1/2012			J1N3W4, C-11 2/1/2012		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	11	U	11	11	U	11	10	U	10	11	U	11
Acenaphthylene	PAH	10	U	10	9.7	U	9.7	9.3	U	9.3	9.6	U	9.6
Anthracene	PAH	3.4	U	3.4	3.3	U	3.3	3.2	U	3.2	3.2	U	3.2
Benzo(a)anthracene	PAH	15	J	3.6	3.4	U	3.4	9.0	J	3.3	3.4	U	3.4
Benzo(a)pyrene	PAH	8.1	J	7.1	6.9	U	6.9	9.6	J	6.7	8.7	J	6.8
Benzo(b)fluoranthene	PAH	4.7	U	4.7	4.5	U	4.5	11	J	4.4	9.1	J	4.5
Benzo(ghi)perylene	PAH	8.0	U	8.0	7.7	U	7.7	7.5	U	7.5	7.6	U	7.6
Benzo(k)fluoranthene	PAH	4.4	U	4.4	4.2	U	4.2	4.1	U	4.1	4.2	U	4.2
Chrysene	PAH	12	J	5.4	5.2	U	5.2	9.6	J	5	7.1	J	5.1
Dibenz[a,h]anthracene	PAH	12	U	12	12	U	12	11	U	11	12	U	12
Fluoranthene	PAH	21	J	14	14	U	14	13	U	13	14	U	14
Fluorene	PAH	5.9	U	5.9	5.7	U	5.7	5.5	U	5.5	5.6	U	5.6
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	13	U	13	12	U	12	13	U	13
Naphthalene	PAH	13	U	13	13	U	13	12	U	12	13	U	13
Phenanthrene	PAH	13	U	13	13	U	13	12	U	12	13	U	13
Pyrene	PAH	25	JY	13	13	U	13	12	U	12	13	U	13
Aroclor-1016	PCB	3.1	U	3.1	3.0	U	3.0	2.8	U	2.8	2.9	U	2.9
Aroclor-1221	PCB	9.0	U	9.0	8.6	U	8.6	8.1	U	8.1	8.4	U	8.4
Aroclor-1232	PCB	2.2	U	2.2	2.1	U	2.1	2.0	U	2.0	2.1	U	2.1
Aroclor-1242	PCB	5.2	U	5.2	5.0	U	5.0	4.7	U	4.7	4.9	U	4.9
Aroclor-1248	PCB	5.2	U	5.2	5.0	U	5.0	4.7	U	4.7	4.9	U	4.9
Aroclor-1254	PCB	2.9	U	2.9	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7
Aroclor-1260	PCB	2.9	U	2.9	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7
Aldrin	PEST	0.27	U	0.27	0.27	U	0.27	0.26	U	0.26	0.26	U	0.26
Alpha-BHC	PEST	0.23	U	0.23	0.23	U	0.23	0.22	U	0.22	0.22	U	0.22
alpha-Chlordane	PEST	0.35	U	0.35	0.35	U	0.35	0.34	U	0.34	0.33	U	0.33
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.71	U	0.71	0.72	U	0.72	0.69	U	0.69	0.68	U	0.68
Delta-BHC	PEST	0.43	U	0.43	0.43	U	0.43	0.42	U	0.42	0.41	U	0.41
Dichlorodiphenyldichloroethane	PEST	0.58	U	0.58	0.59	U	0.59	0.57	U	0.57	0.56	U	0.56
Dichlorodiphenyldichloroethylene	PEST	0.25	U	0.25	0.26	U	0.26	0.25	U	0.25	0.25	U	0.25
Dichlorodiphenyltrichloroethane	PEST	0.63	U	0.63	0.64	U	0.64	0.61	U	0.61	0.61	U	0.61
Dieldrin	PEST	0.22	U	0.22	0.23	U	0.23	0.22	U	0.22	0.22	U	0.22
Endosulfan I	PEST	0.19	U	0.19	0.19	U	0.19	0.18	U	0.18	0.18	U	0.18
Endosulfan II	PEST	0.31	U	0.31	0.31	U	0.31	0.30	U	0.30	0.30	U	0.30
Endosulfan sulfate	PEST	0.29	U	0.29	0.30	U	0.30	0.29	U	0.29	0.28	U	0.28
Endrin	PEST	0.33	U	0.33	0.33	U	0.33	0.32	U	0.32	0.32	U	0.32
Endrin aldehyde	PEST	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18	0.18	U	0.18
Endrin ketone	PEST	0.52	U	0.52	0.53	U	0.53	0.51	U	0.51	0.50	U	0.50
Gamma-BHC (Lindane)	PEST	0.50	U	0.50	0.50	U	0.50	0.48	U	0.48	0.48	U	0.48
gamma-Chlordane	PEST	0.28	U	0.28	0.29	U	0.29	0.28	U	0.28	0.27	U	0.27
Heptachlor	PEST	0.23	U	0.23	0.23	U	0.23	0.22	U	0.22	0.22	U	0.22
Heptachlor epoxide	PEST	0.46	U	0.46	0.46	U	0.46	0.44	U	0.44	0.44	U	0.44
Methoxychlor	PEST	0.48	U	0.48	0.49	U	0.49	0.47	U	0.47	0.46	U	0.46
Toxaphene	PEST	17	U	17	17	U	17	16	U	16	16	U	16

Attachment	1	Sheet No.	32 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Attachment 1. 100-D-8 Waste Site Verification Sample Results (Oraganics).

CONSTITUENT	CLASS	J1N3W5, C-12 2/1/2012		
		ug/kg	Q	PQL
Acenaphthene	PAH	9.8	U	9.8
Acenaphthylene	PAH	8.8	U	8.8
Anthracene	PAH	6.6	JX	3.0
Benzo(a)anthracene	PAH	180	X	3.1
Benzo(a)pyrene	PAH	100		6.3
Benzo(b)fluoranthene	PAH	120		4.1
Benzo(ghi)perylene	PAH	44		7.1
Benzo(k)fluoranthene	PAH	67		3.9
Chrysene	PAH	150		4.7
Dibenz[a,h]anthracene	PAH	12	JX	11
Fluoranthene	PAH	300		13
Fluorene	PAH	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	PAH	62		12
Naphthalene	PAH	12	U	12
Phenanthrene	PAH	96		12
Pyrene	PAH	320		12
Aroclor-1016	PCB	2.7	U	2.7
Aroclor-1221	PCB	7.9	U	7.9
Aroclor-1232	PCB	2.0	U	2.0
Aroclor-1242	PCB	4.6	U	4.6
Aroclor-1248	PCB	4.6	U	4.6
Aroclor-1254	PCB	2.5	U	2.5
Aroclor-1260	PCB	2.5	U	2.5
Aldrin	PEST	0.25	U	0.25
Alpha-BHC	PEST	0.22	U	0.22
alpha-Chlordane	PEST	0.33	U	0.33
beta-1,2,3,4,5,6-Hexachlorocyclohexane	PEST	0.67	U	0.67
Delta-BHC	PEST	0.40	U	0.40
Dichlorodiphenyldichloroethane	PEST	0.55	U	0.55
Dichlorodiphenyldichloroethylene	PEST	0.24	U	0.24
Dichlorodiphenyltrichloroethane	PEST	0.59	U	0.59
Dieldrin	PEST	0.21	U	0.21
Endosulfan I	PEST	0.18	U	0.18
Endosulfan II	PEST	0.29	U	0.29
Endosulfan sulfate	PEST	0.28	U	0.28
Endrin	PEST	0.31	U	0.31
Endrin aldehyde	PEST	0.17	U	0.17
Endrin ketone	PEST	0.49	U	0.49
Gamma-BHC (Lindane)	PEST	0.47	U	0.47
gamma-Chlordane	PEST	0.27	U	0.27
Heptachlor	PEST	0.22	U	0.22
Heptachlor epoxide	PEST	0.43	U	0.43
Methoxychlor	PEST	0.45	U	0.45
Toxaphene	PEST	16	U	16

Attachment	1	Sheet No.	33 of 33
Originator	N. K. Schiffern	Date	4/3/12
Checked	I. B. Berezovskiy	Date	4/3/12
Calc. No.	0100D-CA-V0451	Rev. No.	0

Acrobat 8.0

CALCULATION COVER SHEET

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

Area: 100-D

Discipline: Environmental *Calculation No: 0100D-CA-V0452

Subject: 100-D-8 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk 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 = 3 Total = 4	N. K. Schiffern	J. D. Skoglie	L. B. Berezovskiy	D. F. Obenauer	8/6/12

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:	N. K. Schiffern		Date:	04/05/12	Calc. No.:	0100D-CA-V0452	Rev.: 0
Project:	100-D Area Field Remediation		Job No:	14655	Checked:	J. D. Skoglie	Date: 04/05/12
Subject:	100-D-8 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculation						Sheet No. 1 of 3

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 100-D-8 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2009a, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas,* DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2009b, 100 Area Remedial Action Sampling and Analysis Plan, DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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

4) WCH, 2012, *100-D-8 Waste Site Cleanup Verification 95% UCL Calculation*, 0100D-CA-V0451, Rev. 0, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the individual HQ of <1.0 (DOE-RL 2009a).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the excess cancer risk of $<1 \times 10^{-6}$ (DOE-RL 2009a).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	N. K. Schiffern	Date:	04/05/12	Calc. No.:	0100D-CA-V0452	Rev.:	0
Project:	100-D Area Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	04/05/12
Subject:	100-D-8 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculation					Sheet No.	2 of 3

METHODOLOGY:

The 100-D-8 waste site is comprised of three decision units for verification sampling. The direct contact hazard quotient and carcinogenic risk calculations for the 100-D-8 waste site were conservatively calculated for the entire waste site using the greater of the statistical or maximum value for each analyte in all decision units from WCH (2012). Of the contaminants of potential concern (COPCs) for this site, boron, hexavalent chromium, molybdenum, detected polycyclic aromatic hydrocarbons (PAHs), semivolatiles, and pesticides require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. All other site nonradionuclide COPCs were not detected or were quantified below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the maximum value for boron is 2.3 mg/kg, divided by the noncarcinogenic RAG value of 7,200 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is 3.2×10^{-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 2.3×10^{-3}. 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 1.0×10^{-6}. For example, the maximum value for bis(2-ethylhexyl) phthalate is 0.092 mg/kg, divided by 71.4 mg/kg, and multiplied as indicated, is 1.3×10^{-9}. Comparing the value for bis(2-ethylhexyl) phthalate, 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 these values to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None
4) List the cumulative excess cancer risk for carcinogens $>1 \times 10^{-5}$: None

Table 1 shows the results of the calculations.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	N. K. Schiffern	Date:	04/05/12	Calc. No.:	0100D-CA-V0452	Rev.:	0
Project:	100-D Area Field Remediation	Job No:	14655	Checked:	J. D. Skoglie	Date:	04/05/12
Subject:	100-D-8 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculation					Sheet No.	3 of 3

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 100-D-8 Waste Site

Contaminant of Potential Concern[a]	Maximum or Statistical Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	2.3	7,200	3.2E-04	--	--
Chromium, hexavalent[c]	0.213	240	8.9E-04	2.1	1.0E-07
Molybdenum	0.26	400	6.5E-04	--	--
Polycyclic Aromatic Hydrocarbons					
Anthracene	0.0066	24,000	2.8E-07	--	--
Benzo(a)anthracene	0.180	--	--	1.37	1.3E-07
Benzo(a)pyrene	0.100	--	--	0.137	7.3E-07
Benzo(b)fluoranthene	0.120	--	--	1.37	8.8E-08
Benzo(ghi)perylene[d]	0.044	2,400	1.8E-05	--	--
Benzo(k)fluoranthene	0.067	--	--	1.37	4.9E-08
Chrysene	0.150	--	--	13.7	1.1E-08
Dibenz(a,h)anthracene	0.012	--	--	1.37	8.8E-09
Fluoranthene	0.300	3,200	9.4E-05	--	--
Indeno(1,2,3-cd) pyrene	0.062	--	--	1.37	4.5E-08
Phenanthrene[d]	0.096	24,000	4.0E-06	--	--
Pyrene	0.320	2,400	1.3E-04	--	--
Semivolatiles					
Bis(2-ethylhexyl)phthalate	0.092	1,600	5.8E-05	71.4	1.3E-09
Dimethyl phthalate	0.200	80,000	2.5E-06	--	--
Phenol	0.050	24,000	2.1E-06	--	--
Pesticides					
DDE; 4,4'-	0.00032	--	--	2.94	1.1E-10
Dieldrin	0.00036	4	9.0E-05	0.0625	5.8E-09
Totals					
Cumulative Hazard Quotient:			**2.3E-03**		
Cumulative Excess Cancer Risk:					**1.2E-06**

Note:

[a] = From WCH (2012).

[b] = Value obtained from the RDR/RAWP (DOE-RL 2009a) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = Carcinogenic cleanup level calculated based on the inhalation exposure pathway; WAC 173-340-750(3), 1996.

[d] =Toxicity data for benzo(ghi)perylene, and phenanthrene are not available. The cleanup level is based on use of surrogate benzo(ghi)perylene surrogate: pyrene;

phenanthrene surrogate: anthracene.

-- = not applicable

RAG = remedial action goal

PAH = polycyclic aromatic hydrocarbons

CONCLUSION:

The calculations in Table 1 demonstrate that the 100-D-8 waste site meets the requirements for the direct contact hazard quotients and carcinogenic (excess cancer) risk, respectively, as identified in the RDR/RAWP (DOE-RL 2009a) and SAP (DOE-RL 2009b). The direct contact hazard quotients and carcinogenic (excess cancer) risk calculations are for use in the RSVP for this site.

Acrobat 8.0

CALCULATION COVER SHEET

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

Area: 100-D

Discipline: Environmental *Calculation No: 0100D-CA-V0454

Subject: 100-D-8 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater

Computer Program: Excel Program No: Excel 2003

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

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 3 Total = 4	N. K. Schiffern	I. B. Berezovskiy	J. D. Skoglie	D. F. Obenauer	8/6/12

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:	N. K. Schiffern	Date:	4/4/2012	Calc. No.:	0100D-CA-V0454	Rev.:	0
Project:	100-D Area Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	4/4/2012
Subject:	100 D 8 Waste Site Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					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-D-8 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) BHI, 2005, *100 Area Analogous Sites RESRAD Evaluation*, Calculation No. 0100X-CA-V0050 Rev 0, Bechtel Hanford, Inc., Richland, Washington.

2) DOE-RL, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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

4) WCH, 2012, *100-D-8 Waste Site Cleanup Verification 95% UCL Calculations*, 0100D-CA-V0451, Rev. 0, Washington Closure Hanford, Inc., Richland, Washington.

SOLUTION:

1) Generate a HQ for each noncarcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (BHI 2005).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (BHI 2005).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	N. K. Schiffern	Date:	4/4/2012	Calc. No.:	0100D-CA-V0454	Rev.:	0
Project:	100-D Area Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	4/4/2012
Subject:	100-D-8 Waste Site Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No.	2 of 3

METHODOLOGY:

The 100-D-8 waste site was divided into three decision units for the purpose of verification sampling; excavation, overburden, and staging pile area. Hazard quotient and carcinogenic risk calculations for potential impact to groundwater at the 100-D-8 waste site were conservatively calculated for the entire waste site using the greater of the statistical or maximum value for each analyte in all decision units from the 95% UCL calculation (WCH 2012). Of the contaminants of potential concern (COPCs) for this site, boron, hexavalent chromium, dimethylphthalate, and phenol are included because no Hanford background value has been established and the distribution coefficients are less than that necessary to show no migration to groundwater in 1,000 years using the generic site RESRAD model (BHI 2005). Based on this model and a vadose zone of approximately 24.5 m (80 ft) thickness, a K_d of 3.1 or greater is required to show no predicted migration to groundwater in 1,000 years. All other site nonradionuclide COPCs were not detected, quantified below background levels, or have a K_d greater than or equal to 3.1. 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 (mg/L) (calculated with, and related to the hazard quotient through, WAC 173-340-720(3)(a)(ii)(A), 1996) x 100 x 1 mg/1000 mg (conversion factor). This is based on the "100 times rule" of WAC 173-340-740(3)(a)(ii)(A) (1996). For example, the maximum value for boron of 2.3 mg/kg, divided by the noncarcinogenic RAG value of 320 mg/kg is 7.2×10^{-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-D-8 waste site is 5.2×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, and then multiplied by 1×10^{-6}. The 100-D-8 waste site doesn't have any analyte with carcinogen RAG, the criterion for excess cancer risk is met. Consequently, the criterion for cumulative excess cancer risk for carcinogens is also met.

4) The soil cleanup RAGs for protection of groundwater are based on the "100 times" provision in WAC 173-340-740(3)(a)(ii)(A). WAC 173-340-740(3)(a)(ii)(A) (1996) provides the "100 times rule" but also states "unless it can be demonstrated that a higher soil concentration is protective of ground water at the site." When the "100 times rule" values are exceeded, RESRAD was used to demonstrate that higher soil concentrations may be protective of groundwater.

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	N. K. Schiffern	Date:	4/4/2012	Calc. No.:	0100D-CA-V0454	Rev.:	0
Project:	100-D Area Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	4/4/2012
Subject:	100-D-8 Waste Site Protection of Groundwater Hazard Quotient and Carcinogenic Risk Calculation					Sheet No.	3 of 3

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-D-8 waste site.

Contaminants of Potential Concern[a]	Maximum or Statistical Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	2.3	320	7.2E-03	--	--
Chromium, hexavalent	0.213	4.8	4.4E-02	--	--
Semivolatiles					
Dimethylphthalate	0.20	1,600	1.3E-04	--	--
Phenol	0.050	240	2.1E-04	--	--
Totals					
Cumulative Hazard Quotient:			5.2E-02		
Cumulative Excess Cancer Risk:					**0.0E+00**

Notes:
[a] = From WCH (2012).
[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the "100 times" model.
-- = not applicable
RAG = remedial action goal

CONCLUSION:

This calculation demonstrates that the 100-D-8 waste site meets the requirements for the hazard quotients and excess carcinogenic risk for protection of groundwater as identified in the RDR/RAWP (DOE-RL 2009).

APPENDIX F

DATA QUALITY ASSESSMENT

APPENDIX F

DATA QUALITY ASSESSMENT

VERIFICATION SAMPLING

A data quality assessment (DQA) was performed to compare the verification sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (WCH 2011). This DQA was performed in accordance with site specific data quality objectives found in the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2009).

A review of the sample designs (WCH 2011), the field logbook (WCH 2012), 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, 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-D-8 waste site were provided by the laboratories in four sample delivery groups (SDGs): SDG J01366, SDG J01367, SDG JP0348, and SDG JP0368. SDG J01366 was submitted for third-party validation. Major and minor deficiencies are discussed for the 100-D-8 data set, as follows below. If no comments are made about a specific analysis, it should be assumed that no deficiencies affecting the quality of the data were found.

MAJOR DEFICIENCIES

Due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, third-party validation flagged the undetected nitrite and orthophosphate results in SDG J01366 as rejected, flagged with a "UR." The samples were collected on December 12, 2011, and analyzed on December 21, 2011. In addition, the preparation holding time was exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate in SDG J01367 and SDG JP0348. The SDG J01367 samples were collected on December 13, 2011, and analyzed on December 21, 2011. The project flagged the undetected nitrate value for sample J1N010, and all undetected nitrite and orthophosphate values for SDG J01367 as rejected with a "UR." The SDG JP0348 samples were collected on February 1, 2012, and analyzed on February 6 and 7, 2012. The project flagged the undetected nitrate values for samples J1N3V8, J1N3W0, and J1N3W2, and all undetected nitrite and orthophosphate values for SDG JP0348 as rejected with a "UR" flag. The EPA analytical method 353.2 was requested to provide acceptable nitrate/nitrite data for decision-making purposes. Phosphate is not a regulated chemical under *Washington*

Administrative Code (WAC) 173-340, "Model Toxics Control Act-Cleanup." The rejection of the undetected nitrate, nitrite, and orthophosphate data does not hinder the evaluation of the 100-D-8 waste site.

MINOR DEFICIENCIES

SDG J01366

This SDG comprises 13 statistical soil samples (J1MXW2 through J1MXW9, J1MXX0 through J1MXX4) from the 100-D-8 excavation. This SDG includes a field duplicate pair (J1MXX1/J1MXX4). These samples were analyzed for inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, semivolatile organic compounds (SVOC), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), total petroleum hydrocarbons (TPH), ion chromatography (IC) anions, nitrate/nitrite, carbon-14, nickel-63, and tritium by liquid scintillation counting, strontium-90, technecium-99, isotopic plutonium, isotopic thorium, isotopic uranium, and by gamma energy analysis (GEA). SDG J01366 was submitted for third-party validation. Minor deficiencies are as follows:

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, third-party validation flagged the nitrate results, which were all detects, as estimates and flagged with a "J." Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the carbon-14 and tritium results were qualified by third-party validation as estimated with "J" flags, due to lack of a matrix spike (MS) analysis. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the thorium-228, thorium-232, uranium-235 and plutonium-238 results were qualified by third-party validation as estimated with "J" flags, due to lack of a laboratory control sample (LCS) analysis. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

All of the toxaphene data in SDG J01366 were qualified as estimated and flagged "J" by third-party validation due to lack of a MS, matrix spike duplicate (MSD), or LCS analysis for the analyte. Estimated data are acceptable for decision-making purposes.

In the pesticides analysis, the MS/MSD relative percent difference (RPD) for endrin aldehyde was above the quality control (QC) criteria at 62%. The results for endrin aldehyde may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the dimethyl phthalate results are of similar magnitude as the method blank result. Third-party validation raised all dimethyl phthalate results to the required quantitation limit (RQL) of 660 µg/kg and qualified the results as undetected and flagged "U." The data are usable for decision-making purposes.

In the SVOC analysis, the MSD recovery was below the QC limit for 2,4-dinitrophenol (45%). All 2,4-dinitrophenol results were qualified as estimates and flagged "J" by third-party validation. The data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for six analytes (aluminum, beryllium, iron, manganese, antimony, and silicon). For aluminum, iron, and manganese the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony, beryllium, and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony, beryllium, and silicon were 54%, 64%, and 22%, respectively. All antimony, beryllium, and silicon data for SDG J01366 were considered estimated and flagged "J" by third-party validation due to the MS recoveries outside the QC limits. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, all silicon results were considered estimated and flagged "J" by third-party validation due to an LCS below QC limits at 17%. Estimated data are usable for decision-making purposes.

SDG J01367

This SDG comprises 13 statistical soil samples (J0N006 through J0N018) from the 100-D-8 overburden/layback stockpiles. This SDG includes a field duplicate pair (J0N015/J0N018). These samples were analyzed for ICP metals, mercury, hexavalent chromium, PAH, SVOC, PCB, pesticides, IC anions, nitrate/nitrite, carbon-14, nickel-63, technecium-99, and tritium by liquid scintillation counting, strontium-90, isotopic plutonium, isotopic thorium, isotopic uranium, and by GEA. In addition, one equipment blank (J0N019) was collected and analyzed for ICP metals, mercury, and SVOC. Minor deficiencies are as follows:

In the radionuclide analysis, all of the carbon-14 and tritium results may be considered estimated due to lack of an MS analysis. The data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the uranium-235, thorium-228, thorium-232, and plutonium-238 results may be considered estimated due to lack of an LCS analysis. Estimated data are acceptable for decision-making purposes.

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and orthophosphate results in SDG J01367 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the SVOC analysis, the dimethyl phthalate results are of similar magnitude as the method blank result and may be considered estimated due to method blank contamination. The data are usable for decision-making purposes.

In the SVOC analysis, the MS and MSD recoveries were below the QC limit for 2,4-dinitrophenol (37% and 31%). The MS recovery for endosulfan sulfate (48%) was below the QC limit. The LCS recovery for 4-chloroaniline (48%) was below the QC limit. The results for these SVOCs may be considered estimated. The data are usable for decision-making purposes.

In the pesticides analysis, the MS recovery for endosulfan sulfate was below the QC criteria at (48%). The MS/MSD RPD for endosulfan II (34%) and endosulfan sulfate (64%) were above the QC criteria of 30%. Results for these SVOCs may be considered estimated. The data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for five analytes (aluminum, iron, manganese, antimony, and silicon). For most of these analytes the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 54% and 19%, respectively. All antimony and silicon data for SDG J01367 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 QC limits at 19%. Estimated data are usable for decision-making purposes.

SDG JP0348

This SDG comprises 13 statistical soil samples (J1N3V4 through J1N3V9, J1N3W0 through J1N3W6) from the 100-D-8 waste staging pile footprint. This SDG includes a field duplicate pair (J1N3V9/J1N3W6). The samples were analyzed for ICP metals, mercury, hexavalent chromium, PAH, SVOC, PCB, pesticides, IC anions, nitrate/nitrite, carbon-14, nickel-63, technecium-99, and tritium by liquid scintillation counting, strontium-90, isotopic plutonium, isotopic thorium, isotopic uranium, and by GEA. Minor deficiencies are as follows:

In the radionuclide analysis, all of the carbon-14 and tritium results may be considered estimated due to lack of an MS analysis. The data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the uranium-235 and plutonium-238 results may be considered estimated due to lack of an LCS analysis. Estimated data are acceptable for decision-making purposes.

In the hexavalent chromium analysis, the MS recovery was below QC criteria at 58%; therefore, all hexavalent chromium data may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions analysis, due to the preparation holding time being exceeded by greater than twice the limit of 48 hours for nitrate, nitrite, and orthophosphate, the detected nitrate and

orthophosphate results in SDG JP0348 may be considered estimated. Estimated data are acceptable for decision-making purposes.

All of the toxaphene data in SDG JP0348 may be considered estimated due to lack of an MS, MSD, or LCS analysis for the analyte. Estimated data are acceptable for decision-making purposes.

In the pesticides analysis, the MS and MSD recoveries for endrin aldehyde (10% and 29%) were below the QC criteria. In addition, the MS/MSD RPD for endrin aldehyde was above the QC criteria at 94%. The results for endrin aldehyde may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the detected bis(2-ethylhexyl)phthalate results may be considered estimated due to method blank contamination. The data are usable for decision-making purposes.

In the SVOC analysis, the MS and MSD recoveries for 2,4-dinitrophenol (46% and 31%) were below the QC criteria. The MSD recovery for 4,6-dinitro-2-methylphenol (34%) was also below the QC criteria. In addition, the MS/MSD RPDs for 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol were above the QC criteria at 36% and 51%, respectively. The results for 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol may be considered estimated. The data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for five analytes (aluminum, iron, antimony, silicon, and zinc). For aluminum and iron the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony, silicon, and zinc did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony, silicon, and zinc were 50%, 21%, and 48%, respectively. All antimony, silicon, and zinc data for SDG JP0348 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 QC limits at 15%. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the RPDs for lead (65%) and zinc (39%) are above the QC criteria of 30%. Therefore, the results for these constituents may be considered estimated. Estimated data are usable for decision-making purposes.

SDG JP0368

This SDG comprises two statistical soil samples (J1NLP4, J1NLP5) collected after further remediation at the waste staging pile footprint locations C-1 and C-3. These samples replace the ICP metals, mercury, hexavalent chromium, PAH, SVOC, PCB, pesticides, carbon-14, nickel-63, technecium-99, and tritium by liquid scintillation counting, strontium-90,

isotopic plutonium, isotopic thorium, isotopic uranium, and GEA results for samples J1N3V4 and J1N3V6. Minor deficiencies are as follows:

In the radionuclide analysis, all of the carbon-14 and tritium results may be considered estimated due to lack of an MS analysis. The data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the uranium-235 and plutonium-238 results may be considered estimated due to lack of an LCS analysis. Estimated data are acceptable for decision-making purposes.

In the radionuclide analysis, all of the uranium-238 results may be considered estimated due to an RPD above QC limits at 42.4%. Estimated data are acceptable for decision-making purposes.

All of the toxaphene data in SDG JP0368 may be considered estimated due to lack of an MS, MSD, or LCS analysis for the analyte. Estimated data are acceptable for decision-making purposes.

In the pesticides analysis, the MS recovery for endrin aldehyde (14%) was below the QC criteria. In addition, the MS/MSD RPD for endrin aldehyde was above the QC criteria at 123%. The results for endrin aldehyde may be considered estimated. The data are acceptable for decision-making purposes.

In the SVOC analysis, the bis(2-ethylhexyl)phthalate results may be considered estimated due to method blank contamination. The data are usable for decision-making purposes.

In the SVOC analysis, the MS recovery for 2,4-dinitrophenol (32%) was below the QC criteria. In addition, the MS/MSD RPD for 2,4-dinitrophenol (49%) and for 4,6-dinitro-2-methylphenol (31%) were above the QC criteria. The results for 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol may be considered estimated. The data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries were out of project acceptance criteria for five analytes (aluminum, iron, manganese, antimony, and silicon). For aluminum, iron, and manganese the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The original MS recoveries for antimony and silicon were 50% and 10%, respectively. All antimony and silicon data for SDG JP0368 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 QC limits at 16%. Estimated data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

The RPD evaluations of main sample(s) versus the laboratory duplicate(s) are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance (QA)/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Field QA/QC samples, listed in the field logbook (WCH 2012) are shown in Table F-1. The main and QA/QC sample results are presented in Appendix B.

Table F-1. Field Quality Assurance/ Quality Control Samples.

Sample Area	Main Sample	Duplicate Sample
Excavation	J1MXX1	J1MXX4
Overburden	J1N015	J1N018
Staging pile area	J1N3V9	J1N3W6

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). The RPDs 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. The RPDs 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 B provides details on duplicate pair evaluation and RPD calculation.

None of the RPDs are above the acceptance criteria of 30%. A secondary check of the data variability is used when one or both of the samples being evaluated (main and duplicate) is less than five times the target detection limit (TDL), including undetected analytes. In these cases, a control limit of ±2 times the TDL is used (Appendix B) to indicate that a visual check of the data is required by the reviewer. None of the data 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-D-8 waste site verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling.

The DQA review for 100-D-8 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. The analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in the Environmental Restoration 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 B.

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