Waste Site Reclassification Form

Date Submitted: 7/24/06 **Originator:** L. M. Dittmer **Phone:** 372-9664	**Operable Unit(s):** 100-BC-1 **Waste Site ID:** 126-B-3 **Type of Reclassification Action:** Rejected ☐ Closed Out ☐ Interim Closed Out ☒ No Action ☐	**Control Number:** 2005-028 **Lead Agency:** EPA

This form documents agreement among the parties listed below authorizing classification of the subject unit as rejected, closed out, interim closed out, or no action and authorizing backfill of the site, if appropriate. Final removal from the National Priorities List (NPL) of no action, interim closed-out, or closed-out sites will occur at a future date.

Description of current waste site condition:

The 126-B-3 waste site is the former coal storage pit for the 184-B Powerhouse. During demolition operations in the 1970s, the site was used for disposal of demolition debris from 100-B/C Area facilities. The site has been remediated by removing debris and contaminated soils. Evaluation, remediation, and verification sampling of this site have been performed in accordance with remedial action objectives and goals 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* (Remaining Sites ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington. The selected action involved (1) evaluating the site through available process information and confirmatory investigation, (2) remediating the site, (3) demonstrating through visual inspection and verification sampling that cleanup goals have been met, and (4) proposing the site for reclassification as interim closed out.

Basis for reclassification:

The 126-B-3 waste site has been remediated to meet the remedial action objectives specified in the Remaining Sites ROD. The results of verification sampling within the remediation and waste staging pile footprints demonstrated 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 showed that residual contaminant concentrations are protective of groundwater and the Columbia River. Deep zone portions of the site meet the direct exposure cleanup criteria for the rural-residential scenario; therefore, no deep zone institutional controls are required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 126-B-3, 184-B Coal Pit Dumping Area* (attached).

D. C. Smith DOE-RL Project Manager	Signature	8/7/06 Date
NA Ecology Project Manager	Signature	Date
D. A. Faulk EPA Project Manager	Signature	8/7/06 Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 126-B-3, 184-B COAL PIT DUMPING AREA

Attachment to Waste Site Reclassification Form 2005-028

August 2006

REMAINING SITES VERIFICATION PACKAGE FOR THE 126-B-3, 184-B COAL PIT DUMPING AREA

EXECUTIVE SUMMARY

The 126-B-3 waste site, located within the 100-BC-1 Operable Unit, is the site of the former 184-B Powerhouse coal storage pit. During demolition operations in the 1970s, the pit was used for disposal of demolition debris from 100-B/C Area facilities.

The site was evaluated during March 2003 confirmatory sampling efforts to decide if remedial action would be required at the site. Six test pits were excavated in areas identified using geophysical survey data and historical photography. Focused samples were collected from suspect hazardous materials and underlying soils and analyzed for contaminants of potential concern.

Multiple metals, pesticides, semivolatile organic compounds, and total petroleum hydrocarbons were detected above soil remedial action goals and asbestos- and polychlorinated biphenyl-containing debris were identified during confirmatory sampling. Based on these results, it was determined that the 126-B-3 waste site required remedial action.

Site remediation consisted of the removal of suspect hazardous material and contaminated soils within the disposal pit. Approximately 43,100 bank cubic meters (56,400 bank cubic yards) of material was excavated and disposed at the Environmental Restoration Disposal Facility. Remedial actions were performed so as to not preclude any future uses (as bounded by the rural-residential scenario) and to allow unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep).

Following site remediation, an area of chromium-contaminated soil unrelated to waste staging or historical disposal activities at the 126-B-3 waste site was discovered in the northern portion of the western staging area. This area was classified as a discovery site and designated as the 100-B-27 waste site and is not considered within closeout of the 126-B-3 waste site.

Following site remediation, verification soil sampling within the remediation and staging pile footprints was conducted on April 15, 2005, and August 9, 2005. The results indicated that the waste removal action achieved compliance with the remedial action objectives for the 126-B-3 remediation footprint, but that additional material removal was required at the eastern staging pile footprint due to hexavalent chromium contamination. Following the removal of an additional 4,640 bank cubic meters (6,060 bank cubic yards) of material, including a suspect drywell discovered within the staging pile footprint, additional verification sampling was performed on February 7 and 14, 2006. The results indicated that the additional removal action achieved compliance with remedial action objectives. 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 126-B-3 waste site in accordance with the TPA-MP-14 (DOE-RL 1998) procedure.

In accordance with this evaluation, the verification sampling results support a reclassification of this site to interim closed out. The current site conditions achieve the remedial action objectives and the corresponding remedial action goals established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2,*

100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (Remaining Sites ROD) (EPA 1999). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Deep zone portions of this site meet the direct exposure cleanup criteria for the rural-residential scenario; therefore, no deep zone institutional controls are 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 site contaminants of concern, contaminants of potential concern, and other constituents using the statistically-determined concentrations for the remediation and staging pile footprints and the biased sampling data from the eastern staging pile suspect drywell footprint. Screening levels were not exceeded for the site constituents, with the exception of vanadium, boron, lead, and zinc. Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors. It is believed that the presence of these constituents does not pose a risk to ecological receptors, because concentrations of vanadium are below site background levels, and boron concentrations are consistent with those seen elsewhere at the Hanford Site (no established background value is available). Lead and zinc screening value exceedances are limited to the eastern staging pile drywell footprint; the statistically-determined values for lead and zinc for the remainder of the site are below screening levels. The exceedance of soil screening values by concentrations of lead and zinc at the site will be evaluated in the context of additional lines of evidence for ecological effects. A baseline risk assessment for the river corridor portion of the Hanford Site began in 2004, which includes a more complete quantitative ecological risk assessment. That baseline risk assessment will be used to support the final closeout decision for the 126-B-3 waste site.

Table ES-1. Summary of Remedial Action Goals for the 126-B-3 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.	No radionuclides were identified as COCs/COPCs for verification sampling.	NA
Direct Exposure – Nonradionuclides	Attain individual COPC RAGs.	All individual COC/COPC concentrations are below direct exposure RAGs.	Yes
Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	All individual hazard quotients are less than 1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotients for the remediation footprint (1.4×10^{-2}) and staging pile footprint (9.3×10^{-2}) are less than 1.	Yes
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	All individual excess cancer risk values are less than 1×10^{-6}.	Yes
	Attain a cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The total excess cancer risk for the remediation footprint (3.2×10^{-6}) and staging pile footprint (1.3×10^{-6}) are less than 1×10^{-5}.	Yes

Table ES-1. Summary of Remedial Action Goals for the 126-B-3 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Groundwater/River Protection – Radionuclides	Attain single COPC groundwater and river protection RAGs.	No radionuclides were identified as COCs/COPCs for verification sampling.	NA
	Attain national primary drinking water standards:[a] 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.		
	Meet drinking water standards for alpha emitters: the most stringent of 15 pCi/L MCL or 1/25th of the derived concentration guides from DOE Order 5400.5.[b]	No alpha-emitting radionuclides were identified as COCs/COPCs for verification sampling.	
	Meet total uranium standard of 30 µg/L (21.2 pCi/L).[c]	Uranium was not identified as a COC/COPC for verification sampling.	
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	Residual concentrations of copper, lead, manganese, nickel, zinc, aroclor-1260, beta-BHC, 4,4'-DDT, chrysene, and benzo(a) anthracene fail the WAC 173-340-740 three-part test for river and/or groundwater protection and/or exceed the applicable RAGs in direct comparison. However, results of RESRAD modeling (BHI 2005a) indicate that these constituents will not reach groundwater (and therefore the Columbia River) within 1,000 years, with the exception of beta-BHC. Residual concentrations of beta-BHC are not expected to be present in sufficient quantities to migrate completely to groundwater. Therefore, the residual concentrations achieve the RAOs for groundwater and river protection.	Yes

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

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

[c] Based on the isotopic distribution of uranium in the 100 Areas, 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).

COC = contaminant of concern
COP = contaminant of potential concern
MCL = maximum contaminant level
NA = not applicable
RAG = remedial action goal
RAO = remedial action objective
RESRAD = RESidual RADioactivity (dose assessment model)
WAC = *Washington Administrative Code*

REMAINING SITES VERIFICATION PACKAGE FOR THE 126-B-3, 184-B COAL PIT DUMPING AREA

STATEMENT OF PROTECTIVENESS

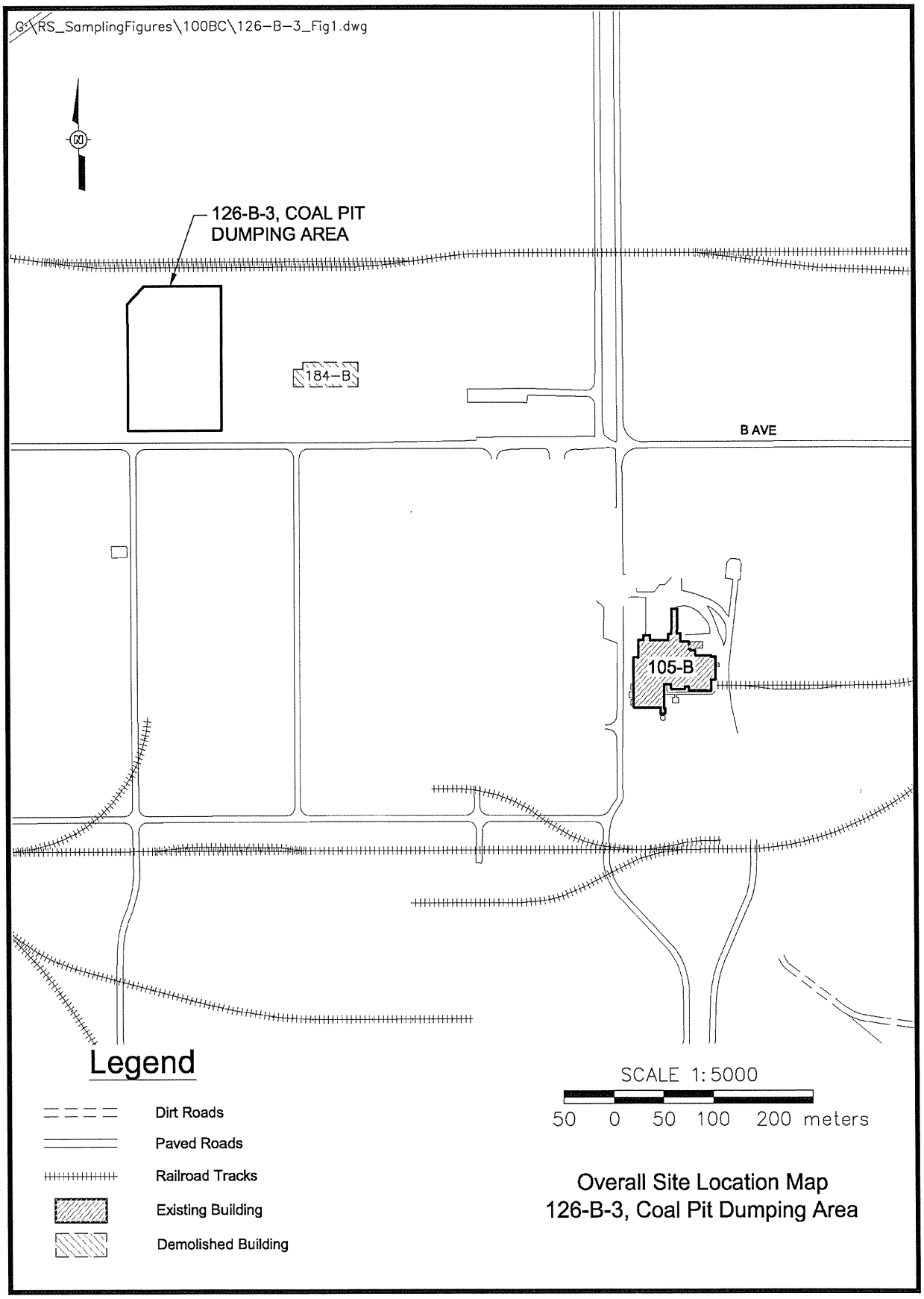
This report demonstrates that the 126-B-3 waste site meets the objectives for interim closure as established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2005b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Deep zone portions of this site meet the direct exposure cleanup criteria for the rural-residential scenario; therefore, no deep zone institutional controls are 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 site contaminants of concern (COCs), contaminants of potential concern (COPCs), and other constituents using the statistically-determined concentrations for the remediation and staging pile footprints and the focused sampling data from the eastern staging pile drywell footprint. Screening levels were not exceeded for the site constituents, with the exception of vanadium, boron, lead, and zinc. Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors. It is believed that the presence of these constituents does not pose a risk to ecological receptors, because concentrations of vanadium are below site background levels, and boron concentrations are consistent with those seen elsewhere at the Hanford Site (no established background value is available). Lead and zinc screening value exceedances are limited to the eastern staging pile drywell footprint; the statistically-determined values for lead and zinc for the remainder of the site are below screening levels. The exceedance of soil screening values by concentrations of lead and zinc at the site will be evaluated in the context of additional lines of evidence for ecological effects. A baseline risk assessment for the river corridor portion of the Hanford Site began in 2004, which includes a more complete quantitative ecological risk assessment. That baseline risk assessment will be used to support the final closeout decision for the 126-B-3 waste site.

GENERAL SITE INFORMATION AND BACKGROUND

The 126-B-3 waste site, part of the 100-BC-1 Operable Unit, is located approximately 450 m (1,500 ft) northwest of the 105-B Reactor Building and 75 m (250 ft) west of the former 184-B Powerhouse (Figure 1). This site was originally excavated to store coal for use in the 184-B Powerhouse and served in this capacity from 1943 through 1968. During demolition operations in the 1970s, the pit was used for disposal of demolition debris from 100-B/C Area facilities. The majority of the debris was from the radiologically released portions of the 108-B Laboratory Building and Tritium Separation Facility, the 117-B and 117-C Filter Buildings, the 115-B/C Gas Recirculation Building, and the 184-B Powerhouse (Carpenter 1994).

Figure 1. Location of the 126-B-3 Waste Site.



Following detections of metals, pesticides, semivolatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH) above soil remedial action goals (RAGs) and the discovery of asbestos- and polychlorinated biphenyl (PCB)-containing material during the 2003 confirmatory sampling event, remedial action was performed at the 126-B-3 waste site from 2003 to 2005.

CONFIRMATORY SAMPLING ACTIVITIES

The 126-B-3 waste site was evaluated during the March 2003 confirmatory sampling efforts to decide if remedial action would be required at the site. Based on site visit observations, geophysical survey information, and the results of confirmatory sampling, a decision was made that remedial action at the site was necessary (BHI 2003b). The following subsections provide additional discussion of the information used to develop the confirmatory sampling design. The results of confirmatory sampling are also summarized to provide support for development of the remedial action strategy and verification sample design.

Geophysical Investigation

A geophysical survey was performed at the 126-B-3 waste site in March 2003 using electromagnetic induction (Bergstrom and Mitchell 2003). Concentrations of anomalous features were detected with the character of the buried debris indicating relatively high concentrations of metal. Several notable linear features were also detected among the debris, as shown in Figure 2.

Contaminants of Potential Concern for Confirmatory Sampling

The COPCs for the 126-B-3 waste site were identified based on existing historical information for the site. The confirmatory sampling design listed asbestos, arsenic, barium, cadmium, chromium (total), lead, selenium, silver, mercury, pesticides, PCBs, SVOCs, volatile organic compounds (VOCs), and TPH as site COPCs (BHI 2003b).

Confirmatory Sample Design

Historical data and photographs, process knowledge, geophysical survey results, and site visit information were used to develop a stratified confirmatory sampling design with focused sampling of soil and debris at the 126-B-3 waste site. Three sampling areas were identified (Figure 3), and a total of six test pits excavated, with locations shown in Figure 4, and samples collected within each test pit. Excavation and confirmatory sampling (BHI 2003b) were performed on March 21 and 24, 2003, and as described in the sampler's field logbook (BHI 2003a).

A summary of the field observations for each of the three areas is as follows:

- Area 1 was identified using the geophysical survey data (Figure 2) and the historical photograph (Figure 3) showing the location of a burn pit. One test pit (test pit 6) was excavated in Area 1 to a depth of approximately 5.0 m (16.5 ft) below ground surface (bgs). At a depth of approximately 0.6 m (2 ft) bgs, suspect asbestos-containing material and concrete debris were encountered. Samples of a pink, wool-like material and a black tar/mastic were collected and submitted for asbestos analysis. At approximately 1.8 m (6 ft) bgs, additional concrete, wood, and metallic

Figure 2. Interpreted Results of the Geophysical Survey at the 126-B-3 Waste Site.

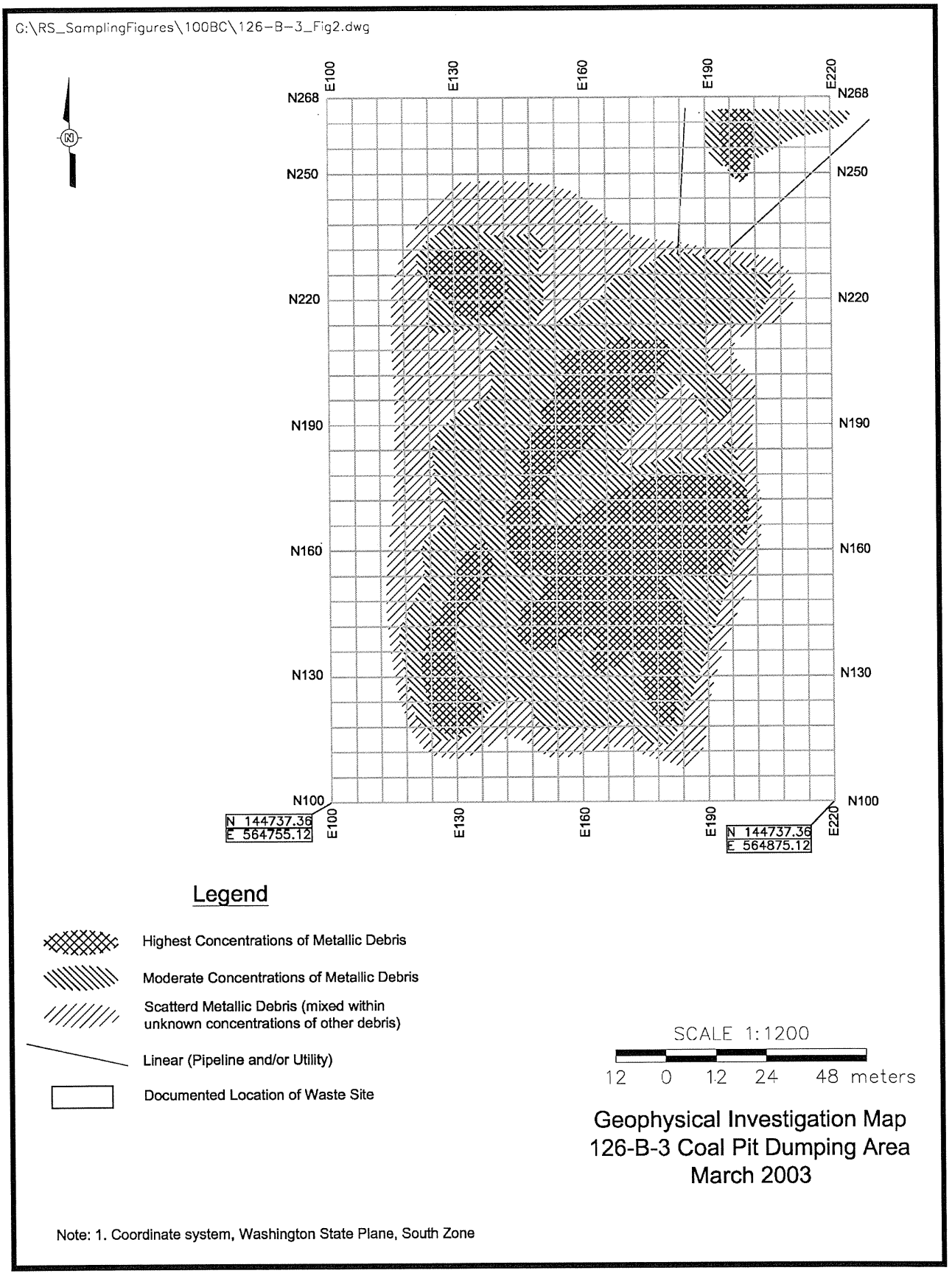


Figure 3. Confirmatory Sampling Areas at the 126-B-3 Waste Site, Identified on a Historical Photograph.

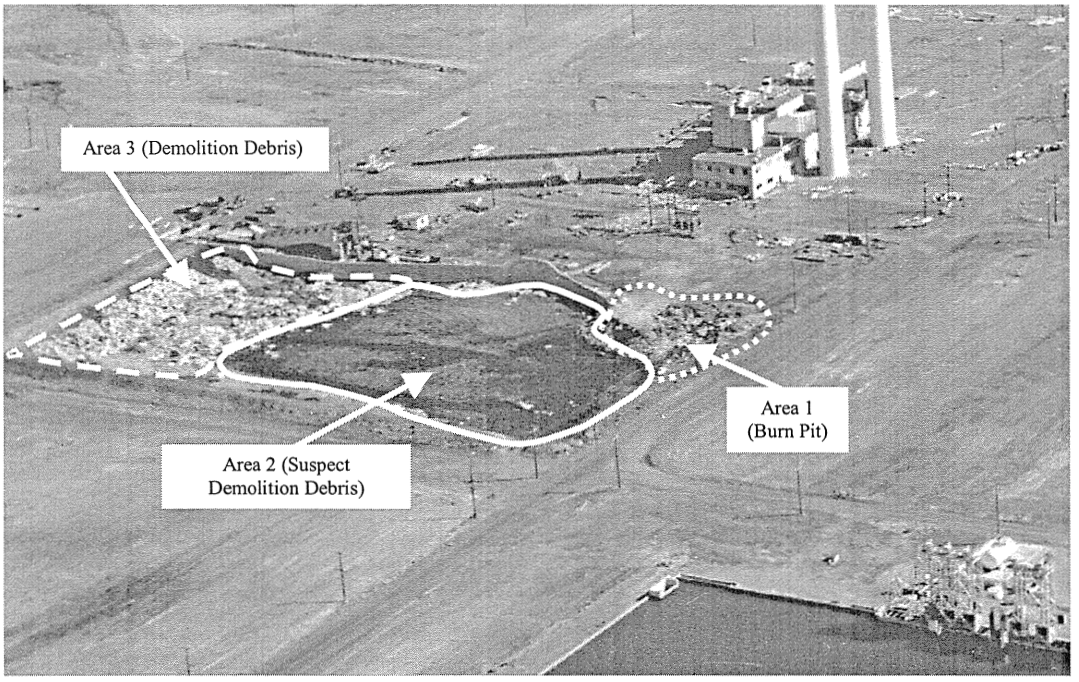
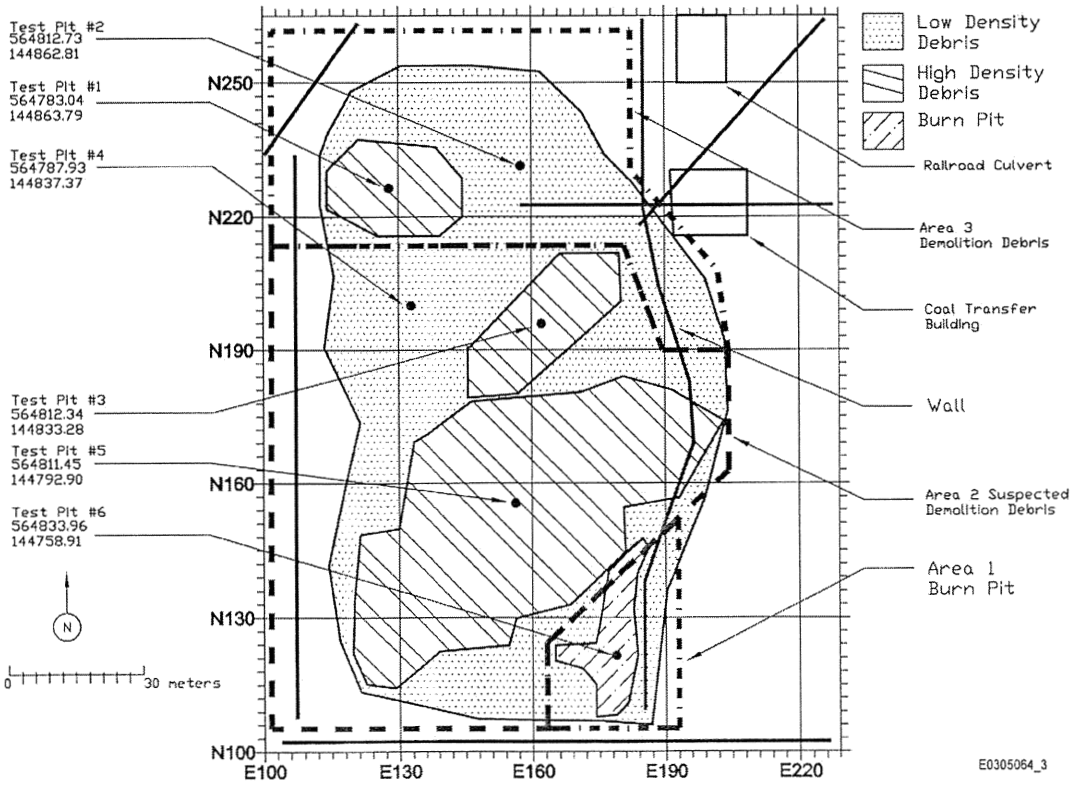


Figure 4. Confirmatory Sampling Areas and Test Pit Locations at the 126-B-3 Waste Site.



debris was discovered. A sample of pipe lagging material was collected and submitted for asbestos analysis. At a depth between 2.1 to 2.4 m (7 to 8 ft), black ash was encountered, continuing to a depth of approximately 4.6 m (15 ft) bgs. A sample of a suspect refractory brick in the ash material was collected and submitted for asbestos analysis. A sample and a duplicate sample of the black ash were collected at a depth of approximately 4.3 m (14 ft) and submitted for analysis for site COPCs. The excavation continued to a depth of approximately 4.9 to 5.0 m (16 to 16.5 ft) bgs, where a sample of native soil was collected and submitted for analysis for the site COPCs. No radiological activity was detected above background by field instrumentation, and no VOCs were detected by an organic vapor monitor (OVM) during sampling activities. A summary of the sample types that were collected, and the laboratory analyses that were performed, is provided in Table 1.

Table 1. Confirmatory Sample Summary for the 126-B-3 Waste Site. (2 Pages)

Sample Location	Sample Media	Sample Number	Coordinate Locations	Depth (field estimate, bgs)	Confirmatory Sample Analysis
Area 1					
Test pit 6	Suspect ACM (wool-like debris)	J00JM2	N 144758.9 E 564834.0	0.6 m (2 ft)	Asbestos
	Suspect ACM (tar/mastic)	J00JM3	N 144758.9 E 564834.0	0.6 m (2 ft)	Asbestos
	Suspect ACM (pipe lagging)	J00JM4	N 144758.9 E 564834.0	1.8 m (6 ft)	Asbestos
	Suspect ACM (refractory brick)	J00JM5	N 144758.9 E 564834.0	Depth not specified	Asbestos
	Ash	J00JJ7	N 144758.9 E 564834.0	4.3 m (14 ft)	GEA, gross alpha, gross beta, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JK2			Asbestos
	Ash (duplicate of J00JJ7)	J00JJ8	N 144758.9 E 564834.0	4.3 m (14 ft)	GEA, gross alpha, gross beta, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
	Ash (duplicate of J00JK2)	J00JK3	N 144758.9 E 564834.0	4.3 m (14 ft)	Asbestos
	Native soil	J00JK0	N 144758.9 E 564834.0	4.9 – 5.0 m (16 – 16.5 ft)	GEA, gross alpha, gross beta, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JK4			Asbestos
Area 2					
Test pit 3	Native soil	J00JR8	N 144833.3 E 564812.3	4.3 m (14 ft)	GEA, gross alpha, gross beta, isotopic uranium, tritium, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JM1			Asbestos

Table 1. Confirmatory Sample Summary for the 126-B-3 Waste Site. (2 Pages)

Sample Location	Sample Media	Sample Number	Coordinate Locations	Depth (field estimate, bgs)	Confirmatory Sample Analysis
Test pit 4	Suspect ACM (gasket)	J00JM6	N 144837.4 E 564787.9	Surface	GEA, gross alpha, gross beta, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JN9			Asbestos
	Native soil	J00JR9	N 144837.4 E 564787.9	3.3 m (10 ft)	GEA, gross alpha, gross beta, isotopic uranium, tritium, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JV2			Asbestos
Test pit 5	Suspect ACM (fire brick)	J00JN8	N 144792.9 E 564811.5	0 – 0.6 m (0 – 2 ft)	Asbestos
	Native soil	J00JR7	N 144792.9 E 564811.5	5 – 5.2 m (16.5 – 17 ft)	GEA, gross alpha, gross beta, isotopic uranium, tritium, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JM0			Asbestos
Area 3					
Test pit 1	Native soil	J00JT3	N 144863.8 E 564783.0	3.3 m (10 ft)	GEA, gross alpha, gross beta, isotopic uranium, tritium, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JV3			Asbestos
Test pit 2	Native soil	J00JT4	N 144862.8 E 564812.7	3 – 3.4 m (10 – 11 ft)	GEA, gross alpha, gross beta, isotopic uranium, tritium, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
		J00JV4			Asbestos
	Native soil (duplicate of J00JT4)	J00JT5	N 144862.8 E 564812.7	3 – 3.4 m (10 – 11 ft)	GEA, gross alpha, gross beta, isotopic uranium, tritium, ICP metals, mercury, TPH, PCB, pesticides, and SVOA
	Native soil (duplicate of J00JV4)	J00JV5			Asbestos
Additional quality control samples					
Equipment blank	Silica sand	J00JT6	NA	NA	GEA, gross alpha, gross beta, americium-241, isotopic plutonium, isotopic uranium, nickel-63, total beta strontium, technetium-99, ICP metals, mercury, and SVOA

Source: *Remaining Sites Field Sampling*, Logbook EL-1577 (BHI 2003a).
ACM = asbestos-containing material
bgs = below ground surface
GEA = gamma energy analysis
ICP = inductively coupled plasma
NA = not applicable
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

- Area 2 was identified using the geophysical survey data (Figure 2) and the historical photograph (Figure 3) as an area of suspect demolition debris disposal. Three test pits (numbered 3 through 5) were excavated in Area 2. Test pits 3 and 5 were located in the center of anomalies identified by the geophysical survey as having high concentrations of subsurface metallic debris. Test pit 4 was located in an area believed to have low concentrations of subsurface metallic debris.

  During excavation of test pit 3, rebar, wire rope, conduit, and piping were encountered approximately 0.6 m (2 ft) bgs. An ash layer was identified at a depth of approximately 2.4 m (8 ft) bgs, extending to native soil at a depth of approximately 4.0 m (13 ft) bgs. A sample was collected from native soil at approximately 4.3 m (14 ft) bgs and submitted for analysis for the site COPCs. No radiological activity was detected above background by field instrumentation, and no VOCs were detected by an OVM during sampling activities.

  A suspect gasket was found at the surface of test pit 4 and sampled for analysis for the site COPCs. Concrete and metal debris were encountered during excavation at a depth of approximately 0.3 m (1 ft) bgs. Ash was discovered at approximately 2.4 m (8 ft) bgs, extending to native soil at approximately 2.9 m (9.5 ft) bgs. A sample was collected from native soil at approximately 3.3 m (10 ft) bgs and submitted for analysis for the site COPCs. No radiological activity was detected above background by field instrumentation, and no VOCs were detected by an OVM during sampling activities.

  Black ash and suspect fire/kiln brick was discovered at the surface and shallow subsurface of test pit 5; a sample of the brick material was collected and submitted for asbestos analysis. Concrete debris was encountered at a depth of approximately 0.9 m (3 ft) bgs. Conduit and 0.038-m (1.5-in.) water piping were discovered at approximately 1.5 m (5 ft) bgs. Black ash was again encountered at a depth of approximately 3.7 m (12 ft) bgs, continuing to native soil at approximately 4.9 m (16 ft) bgs. A sample was collected from native soil at approximately 5.2 m (17 ft) bgs and submitted for analysis for the site COPCs. No radiological activity was detected above background by field instrumentation, and no VOCs were detected by an OVM during sampling activities.

  A summary of the sample types that were collected in area 2, and the laboratory analyses that were performed, is provided in Table 1.

- Area 3 was identified using the geophysical survey data (Figure 2) and the historical photograph (Figure 3) as an area of demolition debris disposal. Two test pits (numbered 1 and 2) were excavated within this area. Test pit 1 was located in the center of an anomaly identified by the geophysical survey as having high concentrations of subsurface metallic debris. Test pit 2 was located in an area believed to have low concentrations of subsurface metallic debris based on the geophysical survey.

  Concrete and metal debris were encountered during excavation of test pit 1 at a depth of approximately 0.5 m (1.5 ft) bgs. A 0.2-m (6-in.)-thick ash layer was found at a depth of 2.7 m (9 ft) bgs. Excavation continued to a depth of approximately 3.3 m (10 ft) bgs, where native soil was encountered and a sample was collected and submitted for analysis for the site COPCs. No radiological activity was detected above background by field instrumentation, and no VOCs were detected by an OVM during sampling activities.

Excavation of test pit 2 revealed pipe, wire, and concrete debris at approximately 0.6 m (2 ft) bgs. A 0.3-m (1-ft)-thick ash layer was encountered at approximately 2.7 m (9 ft) bgs. Excavation continued to a depth of approximately 3.3 m (10 ft) bgs, where native soil was encountered and a primary and field duplicate sample were collected and submitted for analysis for the site COPCs. No radiological activity was detected above background by field instrumentation, and no VOCs were detected by an OVM during sampling activities.

A summary of the sample types that were collected in area 3, and the laboratory analyses that were performed, is provided in Table 1.

Confirmatory Sample Results

Confirmatory samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency (DOE-RL 2005a), and the results were compared against the cleanup criteria specified in the RDR/RAWP (DOE-RL 2005b). The laboratory results were stored in the Environmental Restoration (ENRE) project-specific database prior to providing to the Hanford Environmental Information System (HEIS) and are provided in Appendix A (Table A-1). Based on field observations, additional supplemental analyses were also requested for selected confirmatory samples to support waste characterization, with results shown in Appendix A (Table A-2).

Multiple metals, pesticides, polycyclic aromatic hydrocarbons (PAHs), and TPH were detected above direct exposure RAGs and/or soil RAGs for the protection of groundwater and/or the Columbia River in confirmatory samples. Asbestos- and PCB-containing debris materials were also discovered during excavation, and asbestos was detected in soil samples. Based on these results, it was determined that remedial action was necessary at the site (BHI 2003b).

REMEDIAL ACTION SUMMARY

Remediation of the 126-B-3 burn pit area was performed from September 4 to September 17, 2003, and remediation of the remainder of the site was performed from October 4 to December 27, 2004, with loadout continuing to July 2005. Remediation consisted of the removal of suspect hazardous material and impacted soils within the disposal pit to depths of up to 7 m (23 ft). Material removed included batteries, lead bricks, rubber gaskets, a compressor, metal scrap, concrete rubble, miscellaneous asbestos-containing material, ash, and contaminated soil. Approximately 43,100 bank cubic meters (56,400 bank cubic yards) of material was excavated and staged onsite before disposal at the Environmental Restoration Disposal Facility (ERDF). Photographs of selected debris items are provided in Appendix B. A civil survey completed after initial remediation at the burn pit area but prior to remediation of the remainder of the waste site is provided in Figure 5. Figure 6 shows the post-excavation civil survey and the footprint of the waste staging piles.

During site remediation and loadout, in-process samples of soil and suspect waste materials were collected as needed to support waste characterization and evaluation of the waste profile for disposal of excavated material. Samples of paint (J01786, J00YB7, J00YB8, and J03CN7) from metal debris, soil underlying batteries (J01YT4), suspect diesel-stained soil (J022F6), brown liquid within a pipe (J02J07), soil from a plastic bag containing piping (J02J08), yellow/brown-stained soil (J030D1), and rusty red/brown-stained soil (J030K1 and J030K2) were collected for laboratory analysis. The analytical results for these samples are provided in Appendix A (Table A-3).

Figure 5. Initial Civil Survey of the 126-B-3 Waste Site.

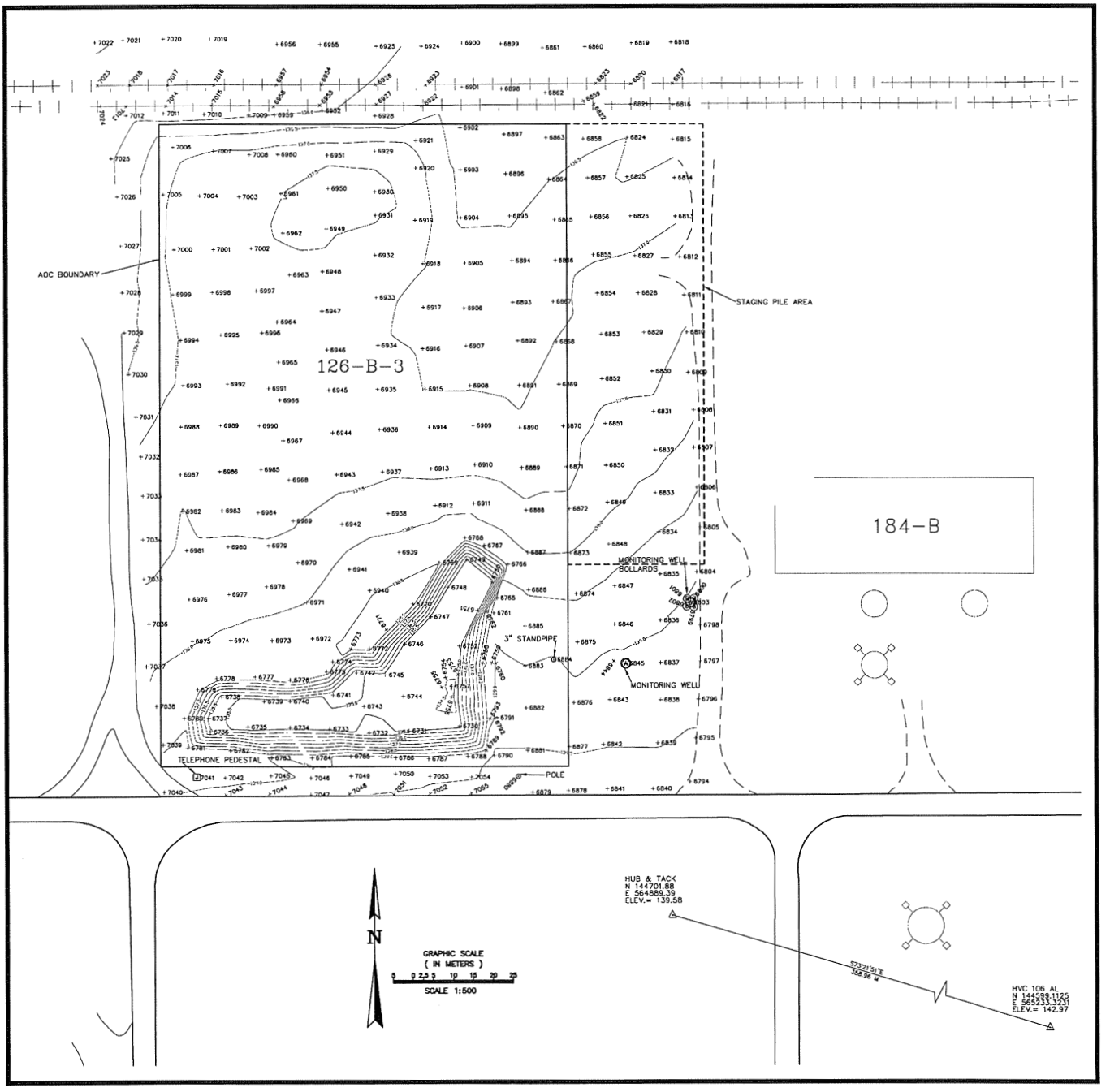
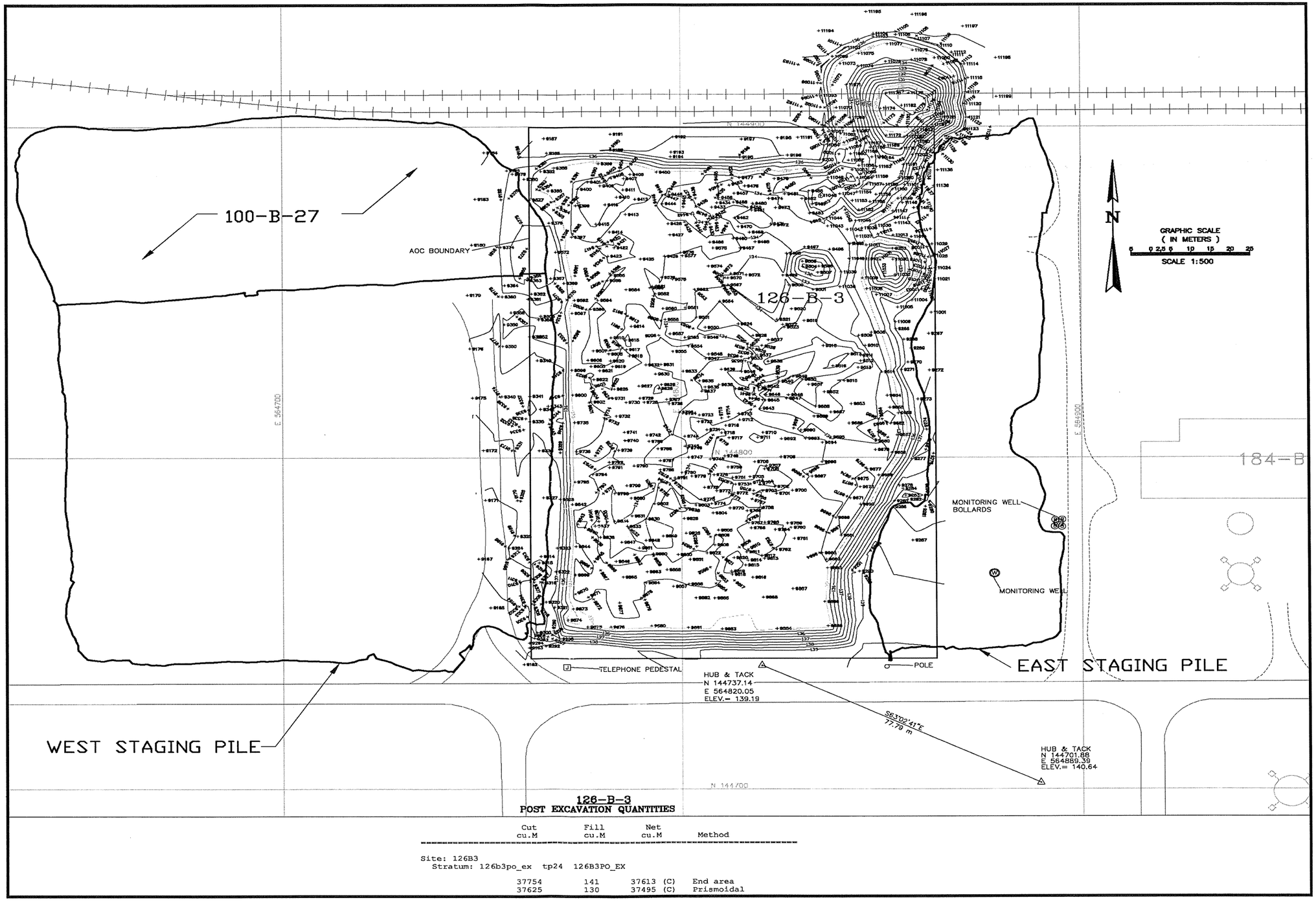


Figure 6. Post-Excavation Civil Survey of the 126-B-3 Waste Site.



126-B-3
POST EXCAVATION QUANTITIES

	Cut cu.M	Fill cu.M	Net cu.M	Method
Site: 126B3				
Stratum: 126b3po_ex tp24 126B3PO_EX				
	37754	141	37613 (C)	End area
	37625	130	37495 (C)	Prismoidal

Near the end of the excavation work, six biased soil samples were collected for TPH analysis as an indicator to assist with guiding the extent of excavation. The analytical results for these samples are provided in Appendix A (Table A-4).

During loadout of material staged in the northern portion of the western staging area, suspect chromium-staining was identified in underlying soils. Elevated chromium concentrations were detected in a sample collected from this material (J030K6), and associated soils were segregated. Elevated chromium concentrations were also detected in waste characterization samples collected from segregated soil (J03CP6 and J03CP7). Because the contamination was unrelated to disposal or remediation staging activities at the 126-B-3 waste site, and because the extent of contamination was unknown, this area was classified as a discovery site and subsequently designated as the 100-B-27 waste site, with boundaries shown in Figure 6. Further evaluation of the 100-B-27 waste site will be performed separately from the 126-B-3 waste site, and no further discussion is presented within this report.

Following verification sampling at the staging pile footprints, hexavalent chromium was detected above RAGs in samples collected from the eastern staging pile footprint. Additional material was removed by scraping an approximately 0.5-m (1.5-ft)-thick layer of soil from the entire area. During soil removal, a suspect drywell unrelated to the 126-B-3 waste site was also discovered and removed (Appendix B, Photograph B-6). Approximately 4,640 bank m^3 (6,060 bank yd^3) of additional soil was removed and disposed at ERDF.

VERIFICATION SAMPLING ACTIVITIES

Verification sampling at the 126-B-3 waste site remediation footprint was performed on April 15, 2005, to evaluate if the remedial action objectives had been reached. Verification sampling at the staging pile footprints was performed on August 9, 2005, and February 7 and 14, 2006, to confirm removal of contamination associated with staged waste materials. Based on statistical evaluation of the resulting data, the residual contaminant concentrations meet the cleanup criteria specified in the RDR/RAWP (DOE-RL 2005b) and the Remaining Sites ROD (EPA 1999). The following subsections provide additional discussion of the information used to develop the verification sampling design. The results of verification sampling are also summarized to support interim closure of the site.

Contaminants of Concern and Contaminants of Potential Concern

The results of confirmatory and waste characterization sampling were used to determine the COCs and COPCs for verification sampling. The analyses performed for verification samples collected from the remediation and staging pile footprints are listed in Table 2 and are inclusive of the constituents that were detected above soil RAGs during previous sampling events. Based on the discovery of hexavalent chromium staining unrelated to the site operational history or remediation activities in the northern portion of the western staging pile footprint, hexavalent chromium analysis was requested for all verification samples collected from this decision unit. Sample analysis for the biased sample collected beneath the suspect drywell discovered in the eastern staging pile footprint were identified based on the screening analyses used at other drywell sites in the 100 Area and are listed in Table 3.

Table 2. Verification Sampling Analyses Performed for the 126-B-3 Waste Site Remediation and Staging Pile Footprints.

Analysis	Basis for Inclusion
ICP metals EPA Method 6010	Multiple metals were detected above background and/or soil RAGs during confirmatory and waste characterization sampling.
Mercury EPA Method 7471	Mercury was detected above soil RAGs for groundwater and river protection during confirmatory sampling.
Hexavalent chromium[a] EPA Method 7196	Hexavalent chromium was discovered in near surface soils following removal of staged waste.
PCBs EPA Method 8082	PCB-containing debris was identified during confirmatory sampling. PCBs were detected above soil RAGs for groundwater and river protection in waste characterization soil sample.
Pesticides EPA Method 8081	Aldrin, DDE, DDT, and endosulfan sulfate were detected above direct exposure RAGs and/or soil RAGs for protection of groundwater and the Columbia River during confirmatory sampling. alpha-Chlordane and endosulfan II were detected in confirmatory samples, but below cleanup criteria.
SVOA EPA Method 8270	Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene were detected above direct exposure RAGs and/or soil RAGs for protection of groundwater and the Columbia River during confirmatory sampling. Benzo(g,h,i)perylene, fluoranthene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, phenanthrene, and pyrene were detected in confirmatory samples, but below cleanup criteria.
TPH EPA Method 418.1	TPH was detected above cleanup criteria during confirmatory sampling.
Asbestos NIOSH Method 7400	ACM was discovered during confirmatory sampling and (less than 1%) asbestos was observed in soil samples.

[a] Hexavalent chromium analysis was performed for the staging pile footprints only.

ACM = asbestos-containing material
EPA = U.S. Environmental Protection Agency
ICP = inductively coupled plasma
NIOSH = National Institute for Occupational Safety and Health
PCB = polychlorinated biphenyl
RAG = remedial action goal
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Table 3. Verification Sampling Analyses Performed for the Suspect Drywell Discovered within the Eastern Staging Pile Footprint.

GEA – gamma spectroscopy	Hexavalent chromium – EPA Method 7196
Gross alpha – proportional counting	PCBs – EPA Method 8082
Gross beta – proportional counting	Pesticides – EPA Method 8081
ICP metals – EPA Method 6010	SVOA – EPA Method 8270
Mercury – EPA Method 7471	TPH – EPA Method 418.1

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
ICP = inductively coupled plasma
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Verification Sample Design

Statistical sampling was performed for the 126-B-3 remediation and staging pile footprints because the spatial distribution of potential residual soil contamination over the study areas was uncertain. The decision rule for demonstrating compliance with the cleanup criteria requires comparison of the true population mean of COCs/COPCs, as estimated by the 95% upper confidence limit on the sample mean, with the cleanup level. The Washington State Department of Ecology publication *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) recommends that systematic sampling with sample locations distributed over the entire study area be used. Therefore, sampling locations were distributed over the entire remediation footprint on a grid basis in an effort to determine the residual presence of contamination.

Visual Sample Plan[1] (VSP) was used as a tool to develop the statistical sampling design for the 126-B-3 waste site. The remediation and staging pile footprints (Figure 6) were delineated in VSP and used as the basis for location of a systematic grid for verification soil sample collection. A pilot study was performed using TPH as an indicator compound to estimate the variability of residual contamination in the soil and support estimates of the population standard deviation for use in VSP. On December 14 and 15, 2004, 20 systematically-located soil samples for TPH analysis were plotted on a triangular grid and collected at the site. The results for these samples are provided in Appendix A (Table A-5). This information was then used in VSP to develop the statistical verification sampling designs (BHI 2005f, 2005g).

Fifteen soil sample locations were identified for the remediation footprint and 10 soil sample locations were identified for the staging pile footprints using random-start triangular grids. Additional details concerning the use of VSP to develop the statistical sampling designs are provided in the 126-B-3 waste site verification sampling work instructions (BHI 2005f, 2005g). Initial verification sampling results indicated that hexavalent chromium concentrations in the eastern staging pile footprint exceeded cleanup criteria. Following additional material removal, 11 new soil sample locations were identified for this area (Phase II) using a random-start triangular grid (Capron 2005). Samples collected during Phase II were submitted for hexavalent chromium analysis only. A biased soil sample was also collected from beneath the suspect drywell discovered in the eastern staging pile footprint.

Figure 6 provides a map of the 37 soil sample locations that were determined for verification sampling, with coordinates shown in Table 4. The soil sample locations were surveyed and staked prior to sample collection (BHI 2005b, 2005c; WCH 2006). All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, as applicable, to fulfill the requirements of the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2005a). Within the remediation footprint, one grab surficial soil sample was collected at each location. Within the staging pile footprints (including the drywell footprint), 1 soil sample was collected at each location by collecting 15 aliquots of surficial soils from within approximately 1 m (3 ft) of the staked location and combining the aliquots into 1 sample. Field quality control (QC) samples consisted of one field duplicate sample and one field equipment blank per sampling event (as identified in Table 4), except that an equipment blank was not collected for the staging pile footprint Phase II sampling event.

[1] Visual Sample Plan is a site map-based user-interface program that may be downloaded at http://dqo.pnl.gov.

Figure 6. Verification Sampling Locations at the 126-B-3 Waste Site.

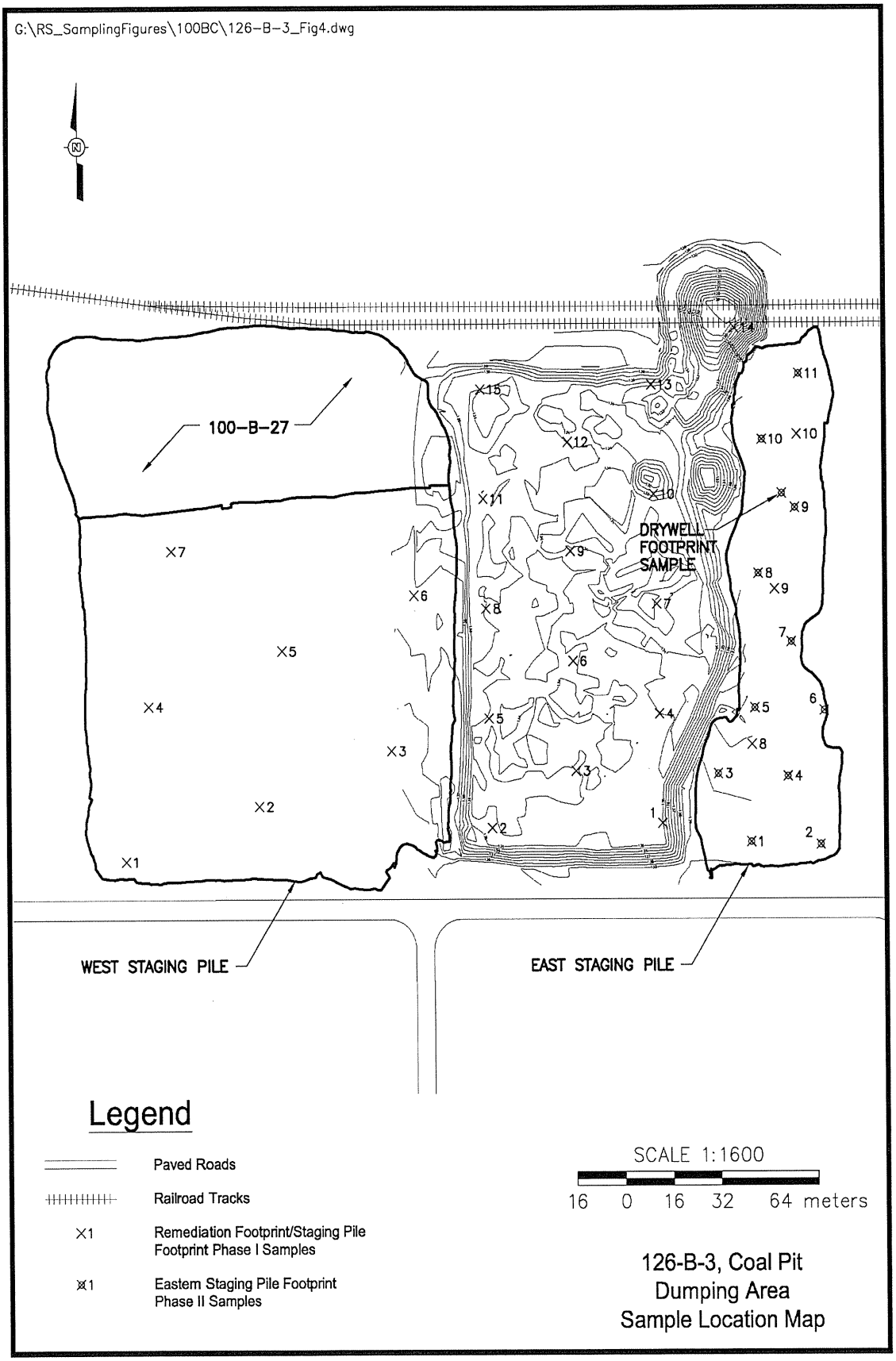


Table 4. 126-B-3 Verification Sample Location Coordinates. (2 Pages)

Sample Location	Sample Number (Chemical Analysis)	Sample Number (Asbestos Analysis)	Washington State Plane Coordinates
Remediation Footprint			
1	J030P3	J030T0	N 144755.1 E 564835.8
2	J030P4	J030T1	N 144753.8 E 564779.4
3	J030P5	J030T2	N 144770.7 E 564807.2
4	J030P6	J030T3	N 144787.6 E 564835.0
5	J030P7	J030T4	N 144786.3 E 564778.6
6	J030P8	J030T5	N 144803.3 E 564806.4
7	J030P9	J030T6	N 144820.2 E 564834.3
8	J030R0	J030T7	N 144818.9 E 564777.8
9	J030R1	J030T8	N 144835.9 E 564805.7
10	J030R2	J030T9	N 144852.8 E 564833.5
11	J030R3	J030V0	N 144851.5 E 564777.1
12	J030R4	J030V1	N 144868.4 E 564804.9
13	J030R5	J030V2	N 144885.4 E 564832.8
14	J030R6	J030V3	N 144902.3 E 564860.6
15[a]	J030R7/J030R8[a]	J030V4/J030V5[a]	N 144884.1 E 564776.3
Equipment blank	J030R9	NA	NA
Staging Pile Footprints (Phase I)			
1[a]	J03WD8/J03WD9[a]	J03WF9/J03WH0[a]	N 144743.9 E 564658.8
2	J03WF0	J03WH1	N 144760.3 E 564702.5
3	J03WF1	J03WH2	N 144776.7 E 564746.2
4	J03WF2	J03WH3	N 144790.0 E 564666.4

Table 4. 126-B-3 Verification Sample Location Coordinates. (2 Pages)

Sample Location	Sample Number (Chemical Analysis)	Sample Number (Asbestos Analysis)	Washington State Plane Coordinates
5	J03WF3	J03WH4	N 144806.4 E 564710.2
6	J03WF4	J03WH5	N 144822.8 E 564753.9
7	J03WF5	J03WH6	N 144836.1 E 564674.1
8	J03WF6	J03WH7	N 144778.5 E 564865.7
9	J03WF7	J03WH8	N 144824.6 E 564873.4
10	J03WF8	J03WH9	N 144870.6 E 564881.0
Equipment blank	J03WJ0	NA	NA
East Staging Pile Footprint (Phase II)			
1	J117L1	NA	N 144749.5 E 564865.3
2	J117L2	NA	N 144748.7 E 564888.3
3	J117L3	NA	N 144769.8 E 564854.5
4	J117L4	NA	N 144769.0 E 564877.5
5[a]	J117L5/J117M2[a]	NA	N 144789.4 E 564866.7
6	J117L6	NA	N 144788.6 E 564889.7
7	J117L7	NA	N 144808.9 E 564878.9
8	J117L8	NA	N 144829.2 E 564868.1
9	J117L9	NA	N 144848.7 E 564880.3
10	J117M0	NA	N 144869.1 E 564869.5
11	J117M1	NA	N 144888.6 E 564881.6
Suspect drywell	J11794	NA	N 144853 E 564876

Sources: *100-B/C Burial Grounds/Remaining Sites Sampling and Field Activities*, Logbooks EFL-1173-4, EFL-1173-5, and EFL-1173-7 (BHI 2005b, 2005c; WCH 2006).

[a] A field duplicate sample was collected at this location, listed after the associated primary sample.

NA = not applicable

Verification Sampling Results

Verification samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods. The 95% upper confidence limit on the true population mean for residual concentrations of COCs and COPCs was calculated for the remediation footprint as specified by the RDR/RAWP (DOE-RL 2005b), with calculations provided in Appendix C. When a nonradionuclide COC or COPC was detected in fewer than 50% of the verification samples collected, the maximum detected value was used for comparison against RAGs. When a COC or COPC was not detected in all samples in the data set, no statistical evaluation or calculations were performed. Evaluation of the verification data from the focused sample from the western staging pile drywell footprint was performed by direct comparison of the sample result for each constituent against cleanup criteria.

Comparisons of the statistical and maximum results for COCs and COPCs and the site RAGs for the remediation footprint, staging pile footprints, and suspect drywell footprint are summarized in Tables 5a, 5b, and 5c, respectively. Contaminants that were not detected by laboratory analysis are excluded from these tables. Calculated cleanup levels are not presented in the *Cleanup Levels and Risk Calculations (CLARC) Database* (Ecology 2005) for aluminum, calcium, iron, magnesium, potassium, silicon, and sodium; therefore these constituents are not considered site COPCs. Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in the sample collected from the eastern staging pile drywell footprint, but are not considered within Table 5c, as these isotopes are not related to the operational history of the site and were detected below the statistical background activity levels (based on an assumption of secular equilibrium, the background activity for radium-228 is equal to the statistical background activity of 1.32 pCi/g for thorium-232 provided in DOE-RL [1996]).

The laboratory-reported data results for all constituents are stored in the ENRE project-specific database prior to providing to the HEIS and are presented in Appendices C and D.

Table 5a. Comparison of Statistical Contaminant Concentrations to Action Levels for the 126-B-3 Remediation Footprint Verification Sampling Event. (3 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Data Set Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	5.9 (<BG)	20	20	20	No	--
Barium	93.4 (<BG)	5,600[b]	132[c,d]	224[e]	No	--
Beryllium	0.56 (<BG)	10.4[f]	1.51[c]	1.51[c]	No	--
Boron[g]	4.9	16,000	320	--[h]	No	--
Chromium (total)	12.2 (<BG)	80,000[b]	18.5[c]	18.5[c]	No	--
Cobalt	11.6 (<BG)	1,600	32	--[h]	No	--
Copper	23.4	2,960	59.2	22.0[c]	Yes	Yes[i]
Lead	8.3 (<BG)	353	10.2[c]	10.2[c]	No	--
Manganese	467 (<BG)	11,200	512[c]	512[c]	Yes[j]	Yes[i]

Table 5a. Comparison of Statistical Contaminant Concentrations to Action Levels for the 126-B-3 Remediation Footprint Verification Sampling Event. (3 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Data Set Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Mercury	0.03 (<BG)	24	0.33[c]	0.33[c]	No	--
Molybdenum[g]	1.4	400	8	--[h]	No	--
Nickel	15.9 (<BG)	1,600	19.1[c]	27.4	Yes[j]	Yes[i]
Vanadium	66.9 (<BG)	560	85.1[c]	--[h]	No	--
Zinc	62.4 (<BG)	24,000	480	67.8[c]	Yes[j]	Yes[i]
Aroclor-1260	0.017	0.5	0.017[k]	0.017[k]	Yes	Yes[i]
1,2,4-Trichlorobenzene	0.052	800	7	45.4	No	--
2-Methylnaphthalene	0.39	320	3.2	--[h]	No	--
Acenaphthene	0.055	4,800	96	129	No	--
Anthracene	0.15	24,000	240	1,920	No	--
Benzo(a)anthracene	0.35	1.37[l]	0.33[k]	0.33[k]	Yes	Yes[i]
Benzo(a)pyrene	0.27	0.33[k]	0.33[k]	0.33[k]	No	--
Benzo(b)fluoranthene	0.19	1.37[l]	0.33[k]	0.33[k]	No	--
Benzo(g,h,i)perylene[m]	0.17	2,400	48	192	No	--
Benzo(k)fluoranthene	0.24	13.7[l]	0.33[k]	0.33[k]	No	--
Carbazole	0.075	50	0.438	--[h]	No	--
Chrysene	0.37	137[l]	1.2[l]	0.33[k]	Yes	Yes[i]
Dibenzo(a,h) anthracene	0.088	0.33[k]	0.33[k]	0.33[k]	No	--
Dibenzofuran	0.099	160	3.2	--[h]	No	--
Fluoranthene	0.73	3,200	64	18	No	--
Fluorene	0.071	3,200	64	260	No	--
Indeno(1,2,3-cd) pyrene	0.16	1.37	0.33[k]	0.33[k]	No	--
N-nitrosodiphenylamine	0.10	204	1.79	1.946	No	--
Naphthalene	0.12	1,600	16	988	No	--
Phenanthrene[m]	0.62	24,000	240	1,920	No	--

Table 5a. Comparison of Statistical Contaminant Concentrations to Action Levels for the 126-B-3 Remediation Footprint Verification Sampling Event. (3 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Data Set Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Pyrene	0.70	2,400	48	192	No	--

[a] Lookup values and RAGs obtained from DOE-RL (2005b) or calculated per WAC 173-340-720, 173-340-730, and 173-340-740, Method B, 1996, unless otherwise noted.

[b] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), 1996 (Method B for soils) (as presented in DOE-RL [2005b]). Updated oral reference dose values (as provided in IRIS) yield Method B direct exposure RAG values of 16,000 mg/kg and 120,000 mg/kg for barium and chromium, respectively.

[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d]) (1996).

[d] Barium soil cleanup level for groundwater protection calculated from WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule") and WAC 173-340-720(3), 1996 (Method B for groundwater) is 112 mg/kg (as presented in DOE-RL [2005b]). The updated oral reference dose value (as provided in IRIS) yields a Method B groundwater cleanup criteria of 7 mg/L, as compared to the more restrictive MCL of 2 mg/L (40 CFR 141). Per WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule"), the most restrictive updated soil cleanup level for groundwater protection would be 200 mg/kg.

[e] Barium soil cleanup level for river protection calculated from WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule"), a DAF of 2, and WAC 173-340-720(3), 1996 (Method B for groundwater) is 224 mg/kg (as presented in DOE-RL [2005b]). No surface water bioconcentration factor is available for barium and no AWQC value exists; therefore, no WAC 173-340-730(3), 1996 (Method B for surface waters) value can be determined.

[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750[3], 1996 (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m^3 (WDOH 1997).

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

[h] No cleanup level is available from the *Cleanup Levels and Risk Calculations (CLARC) Database* (Ecology 2005), and no bioconcentration factor or AWQC values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

[i] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), copper, manganese, nickel, zinc, aroclor-1260, benzo(a)anthracene, and chrysene will not migrate more than 3.3 m (10 ft) vertically in 1,000 years. The vadose zone underlying the remediation footprint is approximately 9 m (30 ft) thick.

[j] Statistical data sets for manganese, nickel, and zinc fail the third component of the WAC 173-340-740(7)(e) three-part test (more than 10% of the data set exceeds soil RAGs for groundwater and/or river protection).

[k] Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996, and DOE-RL [2005b]).

[l] Value listed in DOE-RL [2005b) is based on the use of benzo(a)pyrene as a surrogate. Compound-specific carcinogenic cleanup level calculated per WAC 173-340-740(3), 1996 (Method B for soils) using the ORNL oral cancer potency factor.

[m] Toxicity data for this chemical are not available. RAGs for benzo(g,h,i)perylene and phenanthrene are based on the surrogate chemicals pyrene and anthracene, respectively.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
CFR = *Code of Federal Regulations*
COC = contaminant of concern
COPC = contaminant of potential concern
DAF = dilution attenuation factor
IRIS = Integrated Risk Information System
MCL = maximum contaminant level (drinking water standard)
ORNL = Oak Ridge National Laboratory
RAG = remedial action goal
RDL = required detection limit
RESRAD = RESidual RADioactivity (dose assessment model)
WAC = *Washington Administrative Code*

Table 5b. Comparison of Statistical Contaminant Concentrations to Action Levels for the 126-B-3 Staging Pile Footprints Verification Sampling Events. (3 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Data Set Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	4.8 (<BG)	20	20	20	No	--
Barium	72.1 (<BG)	5,600[b]	132[c,d]	224[e]	No	--
Beryllium	0.9 (<BG)	10.4[f]	1.51[c]	1.51[c]	No	--
Boron[g]	3.4	16,000	320	--[h]	No	--
Chromium (total)	9.6 (<BG)	80,000[b]	18.5[c]	18.5[c]	No	--
Chromium (hexavalent)	0.32 / 0.49[i]	2.1	4.8[j]	2	No	--
Cobalt	7.3 (<BG)	1,600	32	--[h]	No	--
Copper	17.2 (<BG)	2,960	59.2	22.0[c]	No	--
Lead	5.3 (<BG)	353	10.2[c]	10.2[c]	No	--
Manganese	311 (<BG)	11,200	512[c]	512[c]	No	--
Mercury	0.03 (<BG)	24	0.33[c]	0.33[c]	No	--
Nickel	11.6 (<BG)	1,600	19.1[c]	27.4	No	--
Vanadium	38.9 (<BG)	560	85.1[c]	--[h]	No	--
Zinc	39.9 (<BG)	24,000	480	67.8[c]	No	--
Aroclor-1260	0.053	0.5	0.017[k]	0.017[k]	Yes	Yes[l]
beta-BHC	0.0090	0.556	0.00486	0.00554	Yes	Yes[m]
4,4'-DDT	0.0062	2.94	0.0257	0.005[k]	Yes	Yes[l,m]
Endosulfan sulfate	0.0029	480	9.6	0.186	No	--
Endrin aldehyde	0.0026	24	0.2	0.039	No	--
Endrin ketone	0.0019	24	0.2	0.039	No	--
gamma-Chlordane	0.0024	2.86[n]	0.025[n]	0.0165[k]	No	--
2-Methylnaphthalene	0.17	320	3.2	--[h]	No	--
Anthracene	0.042	24,000	240	1,920	No	--
Benzo(a)anthracene	0.12	1.37[o]	0.33[k]	0.33[k]	No	--
Benzo(a)pyrene	0.091	0.33[k]	0.33[k]	0.33[k]	No	--
Benzo(b)fluoranthene	0.076	1.37[o]	0.33[k]	0.33[k]	No	--
Benzo(g,h,i)perylene[p]	0.046	2,400	48	192	No	--
Benzo(k)fluoranthene	0.085	13.7[o]	0.33[k]	0.33[k]	No	--
Carbazole	0.025	50	0.438	--[h]	No	--
Chrysene	0.14	137[o]	1.2[o]	0.33[k]	No	--

Table 5b. Comparison of Statistical Contaminant Concentrations to Action Levels for the 126-B-3 Staging Pile Footprints Verification Sampling Events. (3 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Data Set Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Dibenzo(a,h) anthracene	0.017	0.33[k]	0.33[k]	0.33[k]	No	--
Dibenzofuran	0.06	160	3.2	--[h]	No	--
Di-n-butylphthalate	0.11	8,000	160	540	No	--
Fluoranthene	0.23	3,200	64	18	No	--
Fluorene	0.021	3,200	64	260	No	--
Indeno(1,2,3-cd) pyrene	0.042	1.37	0.33[k]	0.33[k]	No	--
Naphthalene	0.14	1,600	16	988	No	--
Phenanthrene[p]	0.17	24,000	240	1,920	No	--
Pyrene	0.29	2,400	48	192	No	--

[a] Lookup values and RAGs obtained from DOE-RL [2005b] or calculated per WAC 173-340-720, 173-340-730, and 173-340-740, Method B, 1996, unless otherwise noted.

[b] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), 1996 (Method B for soils) (as presented in DOE-RL [2005b]). Updated oral reference dose values (as provided in IRIS) yield Method B direct exposure RAG values of 16,000 mg/kg and 120,000 mg/kg for barium and chromium, respectively.

[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d]) (1996).

[d] Barium soil cleanup level for groundwater protection calculated from WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule") and WAC 173-340-720(3), 1996 (Method B for groundwater) is 112 mg/kg (as presented in DOE-RL [2005b]). The updated oral reference dose value (as provided in IRIS) yields a Method B groundwater cleanup criteria of 7 mg/L, as compared to the more restrictive MCL of 2 mg/L (40 CFR 141). Per WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule"), the most restrictive updated soil cleanup level for groundwater protection would be 200 mg/kg.

[e] Barium soil cleanup level for river protection calculated from WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule"), a DAF of 2, and WAC 173-340-720(3), 1996 (Method B for groundwater) is 224 mg/kg (as presented in DOE-RL [2005b]). No surface water bioconcentration factor is available for barium and no AWQC value exists; therefore, no WAC 173-340-730(3), 1996 (Method B for surface waters) value can be determined.

[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750[3], 1996 (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m^3 (WDOH 1997).

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

[h] No cleanup level is available from the *Cleanup Levels and Risk Calculations (CLARC) Database* (Ecology 2005), and no bioconcentration factor or AWQC values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

[i] The statistical residual hexavalent chromium concentration for the western staging pile footprint is 0.32 mg/kg and for the eastern staging pile footprint is 0.49 mg/kg.

[j] Calculated cleanup level (per WAC 173-340-720(3), 1996 [Method B for groundwater] and WAC 173-340-740(3)(a)(ii)(A), 1996 ["100 times rule"]) presented is lower than that presented in the RDR/RAWP (DOE-RL 2005b), based on updated oral reference dose value (as provided in IRIS).

[k] Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996, and DOE-RL [2005b]).

[l] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), aroclor-1260 and 4,4'-DDT will not migrate more than 1 m (3.3 ft) vertically in 1,000 years. The vadose zone underlying the staging pile footprints is at least 17 m (56 ft) thick.

[m] Residual pesticide concentrations are believed to be the result of historic pesticide application rather than waste staging activities, and are, therefore, present in insufficient total mass to migrate completely to groundwater (and subsequently the Columbia River).

[n] Direct exposure and groundwater protection RAG values for chlordane were mistakenly calculated based on carcinogenicity data for lindane in DOE-RL [2005b]). Corrected values are presented in this table.

[o] Value listed in DOE-RL [2005b] is based on the use of benzo(a)pyrene as a surrogate. Compound-specific carcinogenic cleanup level calculated per WAC 173-340-740(3), 1996 (Method B for soils) using the ORNL oral cancer potency factor.

Table 5b. Comparison of Statistical Contaminant Concentrations to Action Levels for the 126-B-3 Staging Pile Footprints Verification Sampling Events. (3 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Data Set Exceed RAGs?	Does the Statistical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		

[p] Toxicity data for this chemical are not available. RAGs for benzo(g,h,i)perylene and phenanthrene are based on the surrogate chemicals pyrene and anthracene, respectively.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
CFR = *Code of Federal Regulations*
COC = contaminant of concern
COPC = contaminant of potential concern
DAF = dilution attenuation factor
IRIS = Integrated Risk Information System
MCL = maximum contaminant level (drinking water standard)
ORNL = Oak Ridge National Laboratory
RAG = remedial action goal
RDL = required detection limit
RESRAD = RESidual RADioactivity (dose assessment model)
WAC = *Washington Administrative Code*

Table 5c. Comparison of Detected Contaminant Concentrations to Action Levels for the 126-B-3 Eastern Staging Pile Suspect Drywell Biased Sample. (2 Pages)

COC/COPC	Analytical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Analytical Result Exceed RAGs?	Does the Analytical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	5.9 (<BG)	20	20	20	No	--
Barium	96.3 (<BG)	5,600[b]	132[c,d]	224[e]	No	--
Beryllium	0.98 (<BG)	10.4[f]	1.51[c]	1.51[c]	No	--
Boron[g]	3.3	16,000	320	--[h]	No	--
Cadmium[i]	0.36 (<BG)	13.9	0.81[c]	0.81[c]	No	--
Chromium (total)	13.8 (<BG)	80,000[b]	18.5[c]	18.5[c]	No	--
Cobalt	12.9 (<BG)	1,600	32	--[h]	No	--
Copper	46.0	2,960	59.2	22.0[c]	Yes	Yes[j]
Lead	18.6	353	10.2[c]	10.2[c]	Yes	Yes[j]
Manganese	467 (<BG)	11,200	512[c]	512[c]	No	--
Mercury	0.09 (<BG)	24	0.33[c]	0.33[c]	No	--
Nickel	19.3	1,600	19.1[c]	27.4	Yes	Yes[j]
Vanadium	57.1 (<BG)	560	85.1[c]	--[h]	No	--
Zinc	220	24,000	480	67.8[c]	Yes	Yes[j]
beta-BHC	0.0024	0.556	0.00486	0.00554	No	--

Table 5c. Comparison of Detected Contaminant Concentrations to Action Levels for the 126-B-3 Eastern Staging Pile Suspect Drywell Biased Sample. (2 Pages)

COC/COPC	Analytical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Analytical Result Exceed RAGs?	Does the Analytical Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
4,4'-DDT	0.0016	2.94	0.0257	0.005[k]	No	--
2-Methylnaphthalene	0.076	320	3.2	--[h]	No	--
bis(2-Ethylhexyl) phthalate	0.092	71.4	0.625	0.36	No	--
Di-n-butylphthalate	0.025	8,000	160	540	No	--
Naphthalene	0.044	1,600	16	988	No	--
Phenanthrene[l]	0.034	24,000	240	1,920	No	--
Pyrene	0.022	2,400	48	192	No	--

[a] Lookup values and RAGs obtained from DOE-RL [2005b] or calculated per WAC 173-340-720, 173-340-730, and 173-340-740, Method B, 1996, unless otherwise noted.
[b] Noncarcinogenic cleanup level calculated from WAC 173-340-740(3), 1996 (Method B for soils) (as presented in DOE-RL [2005b]). Updated oral reference dose values (as provided in IRIS) yield Method B direct exposure RAG values of 16,000 mg/kg and 120,000 mg/kg for barium and chromium, respectively.
[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d]) (1996).
[d] Barium soil cleanup level for groundwater protection calculated from WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule") and WAC 173-340-720(3), 1996 (Method B for groundwater) is 112 mg/kg (as presented in DOE-RL [2005b]). The updated oral reference dose value (as provided in IRIS) yields a Method B groundwater cleanup criteria of 7 mg/L, as compared to the more restrictive MCL of 2 mg/L (40 CFR 141). Per WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule"), the most restrictive updated soil cleanup level for groundwater protection would be 200 mg/kg.
[e] Barium soil cleanup level for river protection calculated from WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule"), a DAF of 2, and WAC 173-340-720(3), 1996 (Method B for groundwater) is 224 mg/kg (as presented in DOE-RL [2005b]). No surface water bioconcentration factor is available for barium and no AWQC value exists; therefore, no WAC 173-340-730(3), 1996 (Method B for surface waters) value can be determined.
[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750[3], 1996 (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m^3 (WDOH 1997).
[g] No Hanford Site-specific or Washington State background value available.
[h] No cleanup level is available from the *Cleanup Levels and Risk Calculations (CLARC) Database* (Ecology 2005), and no bioconcentration factor or AWQC values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).
[i] Hanford Site-specific background value is not available; not evaluated during background study. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[j] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), copper, lead, nickel, and zinc will not migrate more than 3.3 m (10 ft) vertically in 1,000 years. The vadose zone underlying the drywell footprint is approximately 17 m (56 ft) thick.
[k] Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996, and DOE-RL [2005b]).
[l] Toxicity data for phenanthrene are not available; RAG values are based on the surrogate chemical anthracene.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
CFR = *Code of Federal Regulations*
COC = contaminant of concern
COPC = contaminant of potential concern
DAF = dilution attenuation factor
IRIS = Integrated Risk Information System
MCL = maximum contaminant level (drinking water standard)
ORNL = Oak Ridge National Laboratory
RAG = remedial action goal
RDL = required detection limit
RESRAD = RESidual RADioactivity (dose assessment model)

DATA EVALUATION

When using a statistical sampling approach, a RAG requirement for nonradionuclides is the WAC 173-340-740(7)(e) three-part test. The application of the three-part test for the 126-B-3 waste site verification data sets is included in statistical calculations (Appendix C). The three-part test was not performed when statistical values defaulted to the maximum detected value due to data censorship, as direct evaluation of the maximum result against RAGs was used as the compliance basis.

All residual COC/COPC concentrations for the 126-B-3 remediation footprint pass the three-part test in comparison against direct exposure RAGs. Residual concentrations of copper, manganese, nickel, and zinc in the remediation footprint fail one or more parts of the three-part test in comparison against soil RAGs for the protection of groundwater and/or the Columbia River. The maximum detected residual concentrations of aroclor-1260, benzo(a)anthracene, and chrysene also exceeded soil RAGs for the protection of groundwater and/or the Columbia River. Data were not collected on the vertical extent of residual contamination, but, given the soil-partitioning coefficients of the metals (>22 mL/g), aroclor-1260 (530 mL/g), and the PAHs (>200 mL/g), these contaminants would not be expected to migrate more than 3.3 m (10 ft) vertically in 1,000 years (BHI 2005a). The vadose zone beneath the 126-B-3 excavation is approximately 9 m (30 ft) thick. Therefore, residual concentrations of copper, manganese, nickel, zinc, aroclor-1260, benzo(a)anthracene, and chrysene are protective of groundwater. The only pathway for contamination to reach the Columbia River is via groundwater migration, so these contaminant concentrations are also protective of river water. No asbestos was detected in verification soil samples collected from the remediation footprint.

All residual COC/COPC concentrations for the 126-B-3 staging pile footprints pass the three-part test in comparison against the most restrictive soil RAG. The maximum detected residual concentrations of aroclor-1260, beta-BHC, and 4,4'-DDT exceeded soil RAGs for the protection of groundwater and/or the Columbia River. Data were not collected on the vertical extent of residual contamination, but, given the soil-partitioning coefficients of aroclor-1260 (530 mL/g) and 4,4'-DDT (678 mL/g), these contaminants would not be expected to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone beneath the 126-B-3 staging area is at least 17 m (56 ft) thick. Therefore, residual concentrations of aroclor-1260 and 4,4'-DDT are protective of groundwater. Residual concentrations of beta-BHC and 4,4'-DDT are believed to be the result of historic pesticide application rather than waste staging activities, and are, therefore, present in insufficient quantities to migrate completely to groundwater. The only pathway for contamination to reach the Columbia River is via groundwater migration, so these contaminant concentrations are also protective of river water. No asbestos was detected in verification soil samples collected from the staging pile footprints.

The three-part test was not performed for the data set from the biased sample collected at the eastern staging pile suspect drywell footprint, as direct evaluation of the results against RAGs was used as the compliance basis. Detected concentrations of copper, lead, nickel, and zinc in this sample exceeded soil RAGs for the protection of groundwater and/or the Columbia River. Data were not collected on the vertical extent of residual contamination, but, given the soil-partitioning coefficients of these metals (>22 mL/g), none would be expected to migrate more than 3.3 m (10 ft) vertically in 1,000 years (BHI 2005a). The vadose zone beneath the drywell footprint is approximately 17 m (56 ft) thick. Therefore, residual concentrations of copper, lead, nickel, and zinc are protective of groundwater. The only pathway for contamination to reach the Columbia River is via groundwater migration, so these contaminant concentrations are also protective of river water.

Nonradionuclide risk requirements include a hazard quotient of less than 1.0 for all individual noncarcinogens, 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}. Risk values for the staging pile footprint were conservatively calculated using the higher of the staging pile footprint statistical value and the drywell footprint focused sample result for each constituent. 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 were less than 1.0, and all individual excess carcinogenic risk values were less than 1×10^{-6} (Appendix E). The cumulative hazard quotients for the 126-B-3 remediation and staging pile footprints are 1.4×10^{-2} and 9.3×10^{-2}, respectively, and the cumulative excess carcinogenic risk values are 3.2×10^{-6} and 1.3×10^{-6}, respectively. Therefore, nonradionuclide risk requirements are met.

DATA QUALITY ASSESSMENT

Confirmatory Sampling

A data quality assessment (DQA) review was performed to compare the confirmatory sampling approach and resulting analytical data with the sampling and data requirements specified by the project objectives (BHI 2003b) and performance specifications. The review involved evaluation of the data to determine if they are of the right type, quality, and quantity to support their intended use (i.e., closeout decisions). This assessment review completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process and is based on *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* (EPA 2000).

This DQA review was performed in accordance with ENV-1, *Environmental Monitoring & Management.* Specific data quality objectives for the site are found in the SAP (DOE-RL 2005a). The data quality requirements in the SAP are used for assessing data from statistical sampling and do not specifically apply to the data sets resulting from the focused sampling performed for remaining sites. However, to ensure quality data sets, the SAP data quality assurance requirements, as well as the data validation procedures for chemical and radiochemical analysis (BHI 2000a, 2000b), were followed where appropriate.

All samples were collected per the sample design. The sample design allowed for additional samples as required to properly characterize the site. Additional samples were collected from debris materials discovered during excavation as identified in Table 1.

Data from confirmatory samples collected at the 126-B-3 site were provided by the laboratory in the following sample delivery groups (SDGs):

- SDG H2113: samples J00JK0, J00JR7, J00JR8, J00JT3, J00JR9, J00JT4, J00JT5 (field duplicate of J00JT4), and J00JT6 (field equipment blank)
- SDG H2114: samples J00JJ7, J00JJ8 (field duplicate of J00JJ7), and J00JM6
- SDG 20030394: samples J00JV2, J00JV3, J00JV4, and J00JV5 (field duplicate of J00JV4)

- SDG 20030395: sample J00JN9
- SDG 20030397: samples J00JM2, J00JM3, J00JM4, J00JM5, and J00JN8
- SDG 20030398: samples J00JK2, J00JK3 (field duplicate of J00JK2), and J00JK4
- SDG 20030399: samples J00JM0 and J00JM1.

Samples were analyzed for the constituents listed in Table 1. Additionally, inductively coupled plasma (ICP) metals analysis by toxicity characteristic leaching procedure (TCLP), mercury analysis by TCLP, SVOA by TCLP, cyanide analysis, and sulfide analysis were requested for samples J00JJ7, J00JJ8, and J00JM6 to support waste characterization. Cyanide analysis, sulfide analysis, and SVOA by TCLP were also requested for samples J00JR9, J00JT4, and J00JT5. All of the samples specified in the confirmatory sample work instruction were collected and analyzed for the analytes or by the methods requested. Additional radiological analyses were performed for samples in SDG H2113, due to errors on the sample chain of custody froms.

With the exception of the radiological data, the data from the confirmatory sampling either had data quality problems, or had concentrations of target analytes that exceeded RAGs, or both. Therefore, only the radiological data will be reviewed further in this DQA. The remaining analytes and/or methods were retained for verification sampling, and a separate DQA was performed for that data.

No major deficiencies were found in the radiological data. Minor deficiencies are presented below.

SDG H2113

Samples in SDG H2113 are evaluated here for gross alpha, gross beta, and gamma energy analyses. Due to errors on the sample chain of custody forms, the laboratory also analyzed samples J00JR7, J00JR8, J00JT3, J00JR9, J00JT4, and J00JT5 for isotopic uranium and tritium and sample J00JT6 for americium-241, isotopic plutonium, isotopic uranium, nickel-63, total beta radiostrontium, and technetium-99. No significant deficiencies were found.

Activity was detected in the method blank for the nickel-63 analysis of field equipment blank sample J00JT6 (8.5 pCi/g). The required detection limit (RDL) for nickel-63 is 30 pCi/g. The nickel-63 relative percent difference (RPD) between the laboratory duplicate and sample J00JT6 was outside of acceptance criteria at 74%. The reported concentration of nickel-63 in sample J00JT6 was 5.56 pCi/g. The method blank contamination suggests that the nickel-63 activity in sample J00JT6 was actually lower than reported. The lowest RAG for nickel-63 is 83 pCi/g. Considering that nickel-63 was not a COPC for this site and that the sample activity is less than the method blank activity and much less than the lowest RAG, nickel-63 was not retained for verification sampling.

SDG H2114

Samples in SDG H2114 are evaluated here for gross alpha, gross beta, and gamma energy analyses. No deficiencies were found.

SDGs 20030394, 20030395, 20030397, 20030398, and 20030399

Samples in these SDGs were analyzed for asbestos only. Due to the discovery of asbestos-containing debris material and asbestos fibers in soil, asbestos was retained as a COC for verification sampling.

Conclusions

Limited, random or sample matrix-specific influenced batch QC issues such as these are a potential for any analysis. The number and types seen in these data sets were within expectations for the matrix types and analyses performed.

The DQA review of the confirmatory radiological data for the 126-B-3 site found the results to be accurate within the standard errors associated with the methods, including sampling and sample handling. The DQA review for the 126-B-3 site concludes that the radiological data reviewed is of the right type, quality, and quantity to support the intended use. Detection limits, precision, accuracy, and sampling data group completeness were assessed to determine if any analytical results should be rejected as a result of quality assurance and QC deficiencies. All analytical data were found acceptable for decision-making purposes. The confirmatory sample analytical data are stored in the ENRE project-specific database prior to providing to the HEIS and are summarized in Appendix A.

Verification Sampling

A DQA was performed to compare the verification sampling approach and analytical data with the sampling and data requirements specified in the site-specific work instructions (BHI 2005f, 2005g). 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) and completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process and is based on *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* (EPA 2000).

This DQA was performed in accordance with ENV-1, *Environmental Monitoring & Management.* Specific data quality objectives for the site are found in the SAP (DOE-RL 2005a). To ensure quality data sets, the SAP data quality assurance requirements, as well as the data validation procedures for chemical and radiochemical analysis (BHI 2000a, 2000b), are followed where appropriate.

A review of the sample designs (BHI 2005f, 2005g; Capron 2005), the field logbooks (BHI 2005b, 2005c; WCH 2006), and applicable analytical data packages was performed as part of this DQA. All samples were collected per the approved sample designs. The statistical sample design in the work instructions was partially based on population data for residual TPH contamination (BHI 2005f, 2005g). Examination of the verification data sets show that the sample designs were valid for the population distribution data for all residual contaminants.

Data from verification samples collected at the 126-B-3 site were provided by the laboratory in SDGs H3132, H3312, D00536, 05-A-4502, K0216, and K0247. No major deficiencies were found in the data. Minor deficiencies are presented below.

SDG H3132

SDG H3132 consists of 17 samples (J030P3 to 9, J030R0 to 9) analyzed for SVOCs, pesticides, PCBs, metals by ICP analysis, mercury, and TPH. Sample J030R9 is a field equipment blank, and sample

J030R8 is a field duplicate of sample J030R7. Pesticide analysis was not run on the field equipment blank. Third-party data validation was performed on this SDG (BHI 2005d) and is included in the following discussion.

In the SVOC analysis, the common laboratory contaminants bis-(2-ethylhexyl)phthalate, di-n-butyl phthalate, and diethyl phthalate were found in the method blank (MB) at concentrations below the RDL. Third-party validation raised the di-n-butylphthalate results in samples J030R4, J030R9, J030P3, J030P6, J030P7, J030P8, and J030R1 to the RDL, and qualified those results as nondetected with "U" flags. All of the bis-(2-ethylhexyl)phthalate results in SDG 3132 were also raised to the RDL and qualified as nondetected with "U" flags. No qualifiers were added to the diethyl phthalate results. The data are useable for decision-making purposes.

The SVOC RPD between the matrix spike (MS) and the matrix spike duplicate (MSD) for pentachlorophenol was outside of acceptance criteria at 68%. Third-party validation qualified all results in SDG 3132 for pentachlorophenol and associated analytes 2,4,5-trichlorophenol and 2,4,6-trichlorophenol as estimates with "J" flags. Associated analytes are analytes that were not added individually to the spike mix and are therefore dependant on another analyte's QC results. Spike mixes and definitions of associated analytes can be found in SW-846 Method 8270C (EPA 1996). The data remain useable for decision-making purposes.

Also in the SVOC analysis, the MS and MSD recoveries, 93% and 90%, respectively, for 2,4-dinitrotoluene were outside the laboratory-established acceptance criteria. This analyte is also outside the laboratory-established acceptance criteria in the laboratory control sample (LCS), at 96% recovery. Third-party validation determined that the 2,4-dinitrotoluene results show a high bias in the data and all associated analytes with detected results were qualified as estimates. The only associated analyte with positive detections in the field samples was n-nitrosodiphenylamine, in samples J030P3 and J030R4, and were qualified as estimates with "J" flags. The data are useable for decision-making purposes.

In the chlorinated pesticide analysis, the analyte toxaphene was not added to the MS, MSD, or LCS. Third-party validation qualified all of the toxaphene results in SDG H3132 as estimates with "J" flags. The data are useable for decision-making purposes.

In the PCB analysis, a high response to a continuing calibration verification, on the primary analytical column prompted the laboratory to use the back up column for quantitation. The continuing calibration verification was within criteria on the backup column. The data are useable for decision-making purposes.

In the ICP metals analysis, the analyte antimony was outside the acceptance criteria in the MS. Standard procedure by the laboratory is to perform serial dilutions and post-digestion spikes on analytes that are out of criteria in the MS. Results of the follow-up procedures were within acceptance criteria. Third-party validation qualified all antimony results in SDG H3132 as estimates with "J" flags. The data are useable for decision-making purposes.

Barium, beryllium, boron, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc were all found at low concentrations in the ICP metals MB. Sample concentrations within the multiple of 20 of the corresponding MB concentrations are considered estimated. Third-party validation accordingly qualified the boron results in samples J030P4 and J030R7 and the beryllium result in sample J030R9 as nondetected estimates with "UJ" flags. The data are useable for decision-making purposes.

In the TPH analysis, samples J030R0, J030R1, J030R8, and J030R9 were found to be between 3.4° C and 4.9° C when received at the laboratory. The samples were contained in sealed jars and brought back down to temperature before opening. This deficiency is not expected to have any impact on the data. Third-party validation did not qualify the TPH data based on the elevated sample temperature. The data are useable for decision-making purposes.

SDG H3312

SDG H3312 consists of 12 samples (J03WD8, J03WD9, J03WF0 – 8, and J03WJ0) analyzed for SVOCs, pesticides, PCBs, metals by ICP analysis, mercury, hexavalent chromium, and TPH. Sample J03WJ0 is a field equipment blank and sample J03WD9 is a field duplicate of sample J03WD8. Pesticide and hexavalent chromium analysis was not run on the field blank. Third-party data validation was performed on this SDG (BHI 2005e) and is included in the following discussion.

In the SVOC analysis, the common laboratory contaminant bis-(2-ethylhexyl)phthalate was found in the MB at a concentration below the RDL. Third-party validation raised all of the bis-(2-ethylhexyl)phthalate results in the SDG to the RDL and qualified them as nondetected with "U" flags. The data are useable for decision-making purposes.

The SVOC MSs and/or MSDs for nitrobenzene, isophorone, 2-nitrophenol, 2,4-dimethylphenol, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, 2-methylnaphthalene, 4-nitroanaline, and carbazole were below acceptance criteria with recoveries in the range of 45% to 60%. Third-party validation qualified all undetected sample results for these analytes as estimates with "J" flags. The data are useable for decision-making purposes.

The SVOC LCSs for isophorone, 2-nitrophenol, 2,4-dimethylphenol, 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, 2-methylnaphthalene, 4-nitroanaline, n-nitrosodiphenylamine, and carbozole were below the acceptance criteria with recoveries in the range of 38% to 56%. Third-party validation qualified all undetected sample results for these analytes as estimates with "J" flags. The data are useable for decision-making purposes.

In the ICP metals analysis, boron, barium, beryllium, manganese, zinc, and copper were found in sample J03WJ0, the field equipment blank. The low result for copper was similar in magnitude to the MB (contamination) value for copper. Third-party validation qualified the copper result in sample J03WJ0 as an estimated nondetect with a "UJ" flag. The data are useable for decision-making purposes.

Silver, arsenic, barium, cadmium, chromium, copper, manganese, and molybdenum were all found at low concentrations in the ICP metals MB. Sample concentrations within the multiple of 20 of the corresponding MB concentrations are considered estimated. All detected molybdenum results were qualified by third-party validation as estimated nondetects with "UJ" flags. The data are useable for decision-making purposes.

All of the TPH results were undetected with practical quantitation limits around 133 mg/kg. These results are above the RDL for TPH but below the lowest RAG of 200 mg/kg. No qualification was applied by third-party validation. The data are useable for decision-making purposes.

In the chlorinated pesticide analysis, the analyte toxaphene was not added to the MS, MSD, or LCS. Third-party validation qualified all of the toxaphene results in SDG H3312 as estimates with "J" flags. The data are useable for decision-making purposes.

In the hexavalent chromium analysis, sample J03WF7 was reported as a nondetect with a practical quantitation limit above the RDL and equivalent to the lowest RAG (2.0 mg/kg). This sample was collected from an area where elevated hexavalent chromium was detected and additional material removal was performed. Following the additional removal, new hexavalent chromium verification data were collected.

No deficiencies were noted in the PCB analysis.

SDG D00536

SDG D00563 consists of 16 samples (J030V0 – 5, J030T0 – 9) analyzed for asbestos. Sample J030V5 is a field duplicate of sample J030V4. No deficiencies were found.

SDG 05-A-4502

SDG 05-A-4502 consists of 11 samples (J03WH0 – 9, J03WF9) analyzed for asbestos. Sample J03WH0 is a field duplicate of sample J03WF9. No deficiencies were found.

SDG K0216

SDG K0216 consists of one sample, J11794, analyzed for SVOCs, pesticides, PCBs, metals by ICP analysis, mercury, hexavalent chromium, TPH, gross alpha, gross beta, and by gamma spectroscopy.

In the SVOC analysis, the common laboratory contaminant bis-(2-ethylhexyl)phthalate was found in the MB at a concentration below the RDL. There is no significant impact on the field data. The data are useable for decision-making purposes.

In the PCB analysis, the MS recovery for aroclor-1260 was high at 155%. This suggests a high bias in the data. There were no detections in the field sample data, and, therefore, there is no effect on the sample data. The data are useable for decision-making purposes.

In the ICP metals analysis, the LCS results for selenium and silicon were below the laboratory acceptance criteria (80% to 120%) at 78.7% and 62.3%, respectively. The selenium result is within the project acceptance criteria (70% to 130%). The silicon result suggests a low bias in the data for silicon but does not invalidate the data. Silicon is not a COPC for the 126-B-3 waste site. The data are useable for decision-making purposes.

In the pesticide analysis, there is an obvious deficiency in the MS. The MS recoveries for all of the analytes are approximately 20% below what is normally observed. The surrogate recoveries are also below the acceptance criteria by a similar amount. Simultaneously, the MSD and LCS recoveries were within the acceptance criteria and generally displayed a typical response for this analysis. This appears to be a laboratory error that probably occurred during the extraction, which is isolated to the MS. The field sample results are probably not affected, but should be considered estimated. The data are useable for decision-making purposes.

No deficiencies were noted in the other analyses.

SDG K0247

SDG K0247 consists of 12 samples (J117L1 to 9, J117M0 to 2) analyzed for hexavalent chromium. Sample J117M2 is a field duplicate of sample J117L5. No deficiencies were found.

Conclusions

Limited, random, or sample matrix-specific influenced batch QC issues such as these are a potential for any analysis. The number and types seen in these data sets were within expectations for the matrix types and analyses performed.

The DQA review of the verification data for the 126-B-3 site found the results to be accurate within the standard errors associated with the methods, including sampling and sample handling. This DQA review concludes that the 126-B-3 verification data reviewed are of the right type, quality, and quantity to support the intended use. Detection limits, precision, accuracy, and sampling data group completeness were assessed to determine if any analytical results should be rejected as a result of quality assurance and QC deficiencies. All analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in the ENRE project-specific database prior to providing to the HEIS and are summarized in Appendices C and D.

SUMMARY FOR INTERIM CLOSURE

The 126-B-3 waste site has been evaluated and remediated in accordance with the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2005b). Because multiple metals, pesticides, PAHs, and TPH were detected above cleanup criteria in confirmatory sampling, and because asbestos- and PCB-containing materials were discovered at the site, the site was remediated by removing approximately 47,740 bank m^3 (62,440 bank yd^3) of soil and debris to the ERDF. Statistical and focused sampling to verify the completeness of remediation was performed, and analytical results were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection. In accordance with this evaluation, the verification sampling results support a reclassification of the 126-B-3 site to interim closed out. Deep zone portions of this site meet the direct exposure cleanup criteria for the rural-residential scenario; therefore, no deep zone institutional controls are required.

REFERENCES

40 CFR 141, "National Primary Drinking Water Regulations," *Code of Federal Regulations*, as amended.

Bergstrom, K. A. and T. J. Mitchell, 2003, *Results of Geophysical Investigation at Remaining Sites*, Interoffice Memorandum to R. A. Carlson and E. T. Feist, CNN 108137, dated June 25, 2003, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2000a, *Data Validation Procedure for Chemical Analysis*, BHI-01435, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2000b, *Data Validation Procedure for Radiochemical Analysis*, BHI-01433, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

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

BHI, 2003a, *Remaining Site Field Sampling*, Logbook EL-1577, pp. 15 through 23, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2003b, *Waste Site Evaluation for 126-B-3 Dumping Area,* 0100B-CA-V0123, Rev. 1, Bechtel Hanford, Inc., Richland, Washington.

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

BHI, 2005b, *100-B/C Burial Grounds/Remaining Sites Sampling and Field Activities*, Logbook EFL-1173-4, pp. 81 through 83, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2005c, *100-B/C Burial Grounds/Remaining Sites Sampling and Field Activities*, Logbook EFL-1173-5, pp. 85 through 88, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2005d, *Final Validation Package for SDG H3132*, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2005e, *Final Validation Package for SDG H3312*, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2005f, *Work Instruction for Verification Sampling of Waste Site 126-B-3, 184-B Coal Pit Dumping Area*, 0100B-WI-G0002, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2005g, *Work Instruction for Verification Sampling of Waste Site 126-B-3, 184-B Coal Pit Waste Staging Piles*, 0100B-WI-G0009, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

Capron, J. M., 2005, *126-B-3 East Staging Pile Sampling*, CCN 125632, e-mail to L. M. Dittmer, dated December 15, 2005, signed by D. Faulk January 12, 2006, Washington Closure Hanford, Richland, Washington.

Carpenter, R. W., 1994, *100-B Area Technical Baseline Report*, WHC-SD-EN-TI-220, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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

DOE-RL, 1996, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, DOE/RL-96-12, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1998, *Tri-Party Agreement Handbook Management Procedures,* RL-TPA-90-0001, Guideline Number TPA-MP-14, "Maintenance of the Waste Information Data System (WIDS)," U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan,* DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1995, *Guidance on Sampling and Data Analysis Methods*, Publication No. 94-49, Washington State Department of Ecology, Olympia, Washington.

Ecology, 2005, *Cleanup Levels and Risk Calculations (CLARC) Database*, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.

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

EPA, 1996, *SW-846 Method 8270C, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*, Rev. 3, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1999, *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.

EPA, 2000, *Guidance for Data Quality Assessment: Practical Methods for Data Analysis*, EPA/600/R-96/084, U.S. Environmental Protection Agency, Washington, D.C.

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

WCH, 2006, *100-B/C Burial Grounds/Remaining Sites Sampling*, Logbook EFL-1173-7, Washington Closure Hanford, Richland, Washington.

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

APPENDIX A

CONFIRMATORY SAMPLING, IN-PROCESS, WASTE CHARACTERIZATION, AND PILOT STUDY ANALYTICAL RESULTS

Note: Verification sampling results and calculations to support site closeout are provided in Appendices C and D.

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241			Americium-241 GEA			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	3/21/03				0.075	U	0.075	0.048	U	0.048	0.02	U	0.02	0.055	U	0.055	0.057	U	0.057
Duplicate of J00JJ7	J00JJ8	3/21/03				0.28	U	0.28	0.041	U	0.041	0.024	U	0.024	0.073	U	0.073	0.099	U	0.099
Test Pit 6 Soil	J00JK0	3/21/03				0.032	U	0.032	0.023	U	0.023	0.025	U	0.025	0.053	U	0.053	0.082	U	0.082
Test Pit 4 Gasket	J00JM6	3/24/03				0.11	U	0.11	0.048	U	0.048	0.067	U	0.067	0.13	U	0.13	0.15	U	0.15
Test Pit 5 Soil	J00JR7	3/21/03				0.2	U	0.2	0.072	U	0.072	0.083	U	0.083	0.2	U	0.2	0.31	U	0.31
Test Pit 3 Soil	J00JR8	3/21/03				0.18	U	0.18	0.071	U	0.071	0.068	U	0.068	0.18	U	0.18	0.23	U	0.23
Test Pit 4 Soil	J00JR9	3/24/03				0.11	U	0.11	0.057		0.051	0.065	U	0.065	0.11	U	0.11	0.15	U	0.15
Test Pit 1 Soil	J00JT3	3/24/03				0.12	U	0.12	0.055	U	0.055	0.071	U	0.071	0.14	U	0.14	0.17	U	0.17
Test Pit 2 Soil	J00JT4	3/24/03				0.18	U	0.18	0.032	U	0.032	0.034	U	0.034	0.079	U	0.079	0.095	U	0.095
Duplicate of J00JT4	J00JT5	3/24/03				0.15	U	0.15	0.039		0.028	0.03	U	0.03	0.062	U	0.062	0.083	U	0.083
Equipment Blank	J00JT6	3/21/03	0	U	0.22	0.085	U	0.085	0.014	U	0.014	0.019	U	0.019	0.036	U	0.036	0.047	U	0.047

Sample Location	HEIS Number	Sample Date	Europium-155			Gross Alpha			Gross Beta			Nickel-63			Plutonium-238			Plutonium-239/240		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	03/21/03	0.056	U	0.056	1.02	U	2.7	-0.059	U	5.2									
Duplicate of J00JJ7	J00JJ8	03/21/03	0.095	U	0.095	1.93	U	2.6	3.29	U	5.5									
Test Pit 6 Soil	J00JK0	03/21/03	0.052	U	0.052	7.42		4.3	10.2		5.6									
Test Pit 4 Gasket	J00JM6	03/24/03	0.11	U	0.11	-3.91	U	12	6.65	U	7.6									
Test Pit 5 Soil	J00JR7	03/21/03	0.19	U	0.19	4.82		3.7	14.8		6.8									
Test Pit 3 Soil	J00JR8	03/21/03	0.17	U	0.17	1.61	U	3.9	13		6									
Test Pit 4 Soil	J00JR9	03/24/03	0.1	U	0.1	8.32		4.3	15.8		6.5									
Test Pit 1 Soil	J00JT3	03/24/03	0.13	U	0.13	8.75		4	20.3		5.3									
Test Pit 2 Soil	J00JT4	03/24/03	0.109	U	0.11	3.58		3.2	16.4		6.5									
Duplicate of J00JT4	J00JT5	03/24/03	0.087	U	0.087	7.58		3.7	13.8		8									
Equipment Blank	J00JT6	03/21/03	0.049	U	0.049	3.49		2.6	4.84	U	6.6	12.1	B	1.9	0.043	U	0.33	0.085	U	0.33

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

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

B = blank contamination

C = blank contamination

D = dilution

HEIS = Hanford Environmental Information System

GEA = gamma energy analysis

J = estimated

MDA = minimum detectable activity

PQL = practical quantitation limit

Q = qualifier

TCLP = toxicity characteristic leaching procedure

U = undetected

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Sample Location	HEIS Number	Sample Date	Potassium-40			Radium-226			Radium-228			Technetium-99			Thorium-228 GEA			Thorium-232 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
Test Pit 6 ash	J00JJ7	3/21/03	0.636		0.15	0.199		0.041	0.216		0.063				0.202		0.035	0.216		0.063
Duplicate of J00JJ7	J00JJ8	3/21/03	0.6	U	0.6	0.183		0.07	0.185		0.12				0.194		0.057	0.185		0.12
Test Pit 6 Soil	J00JK0	3/21/03	8.19		0.26	0.319		0.045	0.498		0.11				0.552		0.044	0.498		0.11
Test Pit 4 Gasket	J00JM6	3/24/03	0.8	U	0.8	0.092	U	0.092	0.22	U	0.22				0.064	U	0.064	0.22	U	0.22
Test Pit 5 Soil	J00JR7	3/21/03	8.81		0.94	0.268		0.16	0.275	U	0.28				0.328		0.091	0.275	U	0.28
Test Pit 3 Soil	J00JR8	3/21/03	8.24		0.63	0.339		0.14	0.684		0.24				0.4		0.072	0.684		0.24
Test Pit 4 Soil	J00JR9	3/24/03	8.72		0.31	0.358		0.084	0.432		0.19				0.44		0.055	0.432		0.19
Test Pit 1 Soil	J00JT3	3/24/03	9.64		0.64	0.357		0.09	0.573		0.25				0.656		0.088	0.573		0.25
Test Pit 2 Soil	J00JT4	3/24/03	13.7		0.24	0.482		0.056	0.785		0.13				0.668		0.033	0.785		0.13
Duplicate of J00JT4	J00JT5	3/24/03	12.4		0.2	0.463		0.047	0.793		0.096				0.068	U	0.068	0.793		0.096
Equipment Blank	J00JT6	3/21/03	4.48		0.13	0.134		0.026	0.226		0.06	0.07	U	0.5	0.152		0.018	0.226		0.06

Sample Location	HEIS Number	Sample Date	Total Beta Radiostrontium			Tritium			Uranium-233/234			Uranium-235			Uranium-235 GEA			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 6 ash	J00JJ7	3/21/03													0.075	U	0.075			
Duplicate of J00JJ7	J00JJ8	3/21/03													0.14	U	0.14			
Test Pit 6 Soil	J00JK0	3/21/03													0.083	U	0.083			
Test Pit 4 Gasket	J00JM6	3/24/03													0.18	U	0.18			
Test Pit 5 Soil	J00JR7	3/21/03				0.082	U	0.13	0.564		0.2	0.031	U	0.24	0.3	U	0.3	0.41		0.2
Test Pit 3 Soil	J00JR8	3/21/03				0.044	U	0.14	0.383		0.27	0.042	U	0.32	0.28	U	0.28	0.452		0.27
Test Pit 4 Soil	J00JR9	3/24/03				-0.012	U	0.15	0.331		0.25	0	U	0.31	0.16	U	0.16	0.562		0.25
Test Pit 1 Soil	J00JT3	3/24/03				-0.031	U	0.13	0.593		0.18	0.057	U	0.22	0.18	U	0.18	0.474		0.18
Test Pit 2 Soil	J00JT4	3/24/03				-0.069	U	0.14	0.428		0.2	0.162	U	0.25	0.13	U	0.13	0.375		0.2
Duplicate of J00JT4	J00JT5	3/24/03				-0.076	U	0.15	0.592		0.22	0.068	U	0.26	0.11	U	0.11	0.592		0.22
Equipment Blank	J00JT6	3/21/03	0.027	U	0.54				0.235		0.2	0	U	0.24	0.064	U	0.064	0.209		0.2

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Sample Location	HEIS Number	Sample Date	Arsenic			Barium			Cadmium			Chromium			Lead		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J00JT6	3/21/03	0.35	U	0.35	1.2		0.01	0.04	U	0.04	0.19		0.06	0.29		0.26
Test Pit 1 Soil	J00JT3	3/24/03	4.7		0.37	75.8		0.01	0.04	U	0.04	11.7		0.06	8.9		0.28
Test Pit 2 Soil	J00JT4	3/24/03	3.7		0.36	149		0.01	0.05		0.04	12		0.06	10		0.27
Duplicate of J00JT4	J00JT5	3/24/03	3.8		0.37	140		0.01	0.05		0.04	12.4		0.06	9.9		0.28
Test Pit 3 Soil	J00JR8	3/21/03	2.4		0.35	65.5		0.01	0.04	U	0.04	4.5		0.06	3.3		0.26
Test Pit 4 Soil	J00JR9	3/24/03	12.3		0.33	89.2		0.01	0.28		0.04	14		0.06	15.1		0.24
Test Pit 4 Gasket	J00JM6	3/24/03	170	C	0.28	0.97	C	0.01	8.7	C	0.03	4.8	C	0.08	1.2	U	1.2
Test Pit 5 Soil	J00JR7	3/21/03	2.5		0.33	50.6		0.01	1.3		0.04	10.1		0.06	3.6		0.25
Test Pit 6 Ash	J00JJ7	3/21/03	1.0		0.78	106		0.02	0.09	U	0.09	2.4		0.13	3.8		0.58
Duplicate of J00JJ7	J00JJ8	3/21/03	0.83		0.79	99.0		0.02	0.09	U	0.09	2.8		0.13	4.7		0.58
Test Pit 6 Soil	J00JK0	3/21/03	2.4		0.36	99.3		0.01	0.04	U	0.04	5.4		0.06	3.6		0.27

Sample Location	HEIS Number	Sample Date	Mercury			Selenium			Silver			Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J00JT6	3/21/03	0.01	U	0.01	0.36	U	0.36	0.08	U	0.08			
Test Pit 1 Soil	J00JT3	3/24/03	0.02	U	0.02	0.37	U	0.37	0.08	U	0.08	33.2		3.7
Test Pit 2 Soil	J00JT4	3/24/03	0.1		0.02	0.37	U	0.37	0.08	U	0.08	227		3.6
Duplicate of J00JT4	J00JT5	3/24/03	0.09		0.02	0.38	U	0.38	0.08	U	0.08	664		36.6
Test Pit 3 Soil	J00JR8	3/21/03	0.01	U	0.01	0.36	U	0.36	0.08	U	0.08	44.4		3.5
Test Pit 4 Soil	J00JR9	3/24/03	0.81		0.01	0.34	U	0.34	0.07	U	0.07	645		18.2
Test Pit 4 Gasket	J00JM6	3/24/03	0.08		0.02	2.1	U	2.1	0.16		0.10			
Test Pit 5 Soil	J00JR7	3/21/03	0.34		0.02	0.34	U	0.34	0.08	U	0.08	32.1		3.5
Test Pit 6 Ash	J00JJ7	3/21/03	0.04		0.02	1.9		0.81	0.18	U	0.18	185		3.8
Duplicate of J00JJ7	J00JJ8	3/21/03	0.02		0.02	1.8		0.81	0.18	U	0.18	181		3.8
Test Pit 6 Soil	J00JK0	3/21/03	0.02	U	0.02	0.37	U	0.37	0.08	U	0.08	25.6		3.5

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Constituent	J00JJ7 Test Pit 6 Ash Sample Date 03/21/03			J00JJ8 Duplicate of J00JJ7 Sample Date 03/21/03			J00JK0 Test Pit 6 Soil Sample Date 03/21/03			J00JM6 Test Pit 4 Gasket Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls												
Aroclor-1016	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1221	460	U	460	460	U	460	70	U	70	4000000	U	4000000
Aroclor-1232	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1242	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1248	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1254	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1260	230	U	230	230	U	230	35	U	35	2000000	U	2000000
Aroclor-1268	230	U	230	230	U	230				1E+07		2000000
Pesticides												
Aldrin	110	U	110	1200		110	1.8	U	1.8			
alpha-BHC	110	U	110	110	U	110	1.8	U	1.8			
alpha-Chlordane	110	U	110	110	U	110	1.8	U	1.8			
beta-BHC	110	U	110	110	U	110	1.8	U	1.8			
delta-BHC	110	U	110	110	U	110	1.8	U	1.8			
Dichlorodiphenyldichloroethane	230	U	230	230	U	230	3.5	U	3.5			
Dichlorodiphenyldichloroethylene	320		230	310		230	3.5	U	3.5			
Dichlorodiphenyltrichloroethane	230	U	230	230	U	230	3.5	U	3.5			
Dieldrin	230	U	230	230	U	230	3.5	U	3.5			
Endosulfan I	110	U	110	110	U	110	1.8	U	1.8			
Endosulfan II	230	U	230	230	U	230	3.5	U	3.5			
Endosulfan sulfate	230	U	230	230	U	230	3.5	U	3.5			
Endrin	230	U	230	230	U	230	3.5	U	3.5			
Endrin aldehyde	230	U	230	230	U	230	3.5	U	3.5			
Endrin ketone	230	U	230	230	U	230	3.5	U	3.5			
gamma-BHC (Lindane)	110	U	110	110	U	110	1.8	U	1.8			
gamma-Chlordane	110	U	110	110	U	110	1.8	U	1.8			
Heptachlor	110	U	110	110	U	110	1.8	U	1.8			
Heptachlor epoxide	110	U	110	110	U	110	1.8	U	1.8			
Methoxychlor	1100	U	1100	1100	U	1100	18	U	18			
Toxaphene	11000	U	11000	11000	U	11000	180	U	180			
Semivolatile Organic Compounds												
1,2,4-Trichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
1,2-Dichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
1,3-Dichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
1,4-Dichlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4,5-Trichlorophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
2,4,6-Trichlorophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4-Dichlorophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4-Dimethylphenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,4-Dinitrophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
2,4-Dinitrotoluene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2,6-Dinitrotoluene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Chloronaphthalene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Chlorophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Methylnaphthalene	11000	U	11000	710	J	11000	1800	U	1800	5800	U	5800
2-Methylphenol (cresol,o-)	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
2-Nitroaniline	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
2-Nitrophenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
3+4 Methylphenol (cresol, m+p)	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
3,3'-Dichlorobenzidine	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
3-Nitroaniline	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
4,6-Dinitro-2-methylphenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
4-Bromophenylphenyl ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Chloro-3-methylphenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Chloroaniline	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Chlorophenylphenyl ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
4-Nitroaniline	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Constituent	J00JJ7 Test Pit 6 Ash Sample Date 03/21/03			J00JJ8 Duplicate of J00JJ7 Sample Date 03/21/03			J00JK0 Test Pit 6 Soil Sample Date 03/21/03			J00JM6 Test Pit 4 Gasket Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (continued)												
4-Nitrophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
Acenaphthene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Acenaphthylene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Anthracene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(a)anthracene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(a)pyrene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(b)fluoranthene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(ghi)perylene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Benzo(k)fluoranthene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-chloro-1-methylethyl)ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-Chloroethoxy)methane	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-chloroethyl) ether	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Bis(2-ethylhexyl) phthalate	11000	U	11000	11000	U	11000	1800	U	1800	990	J	5800
Butylbenzylphthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Carbazole	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Chrysene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Di-n-butylphthalate	940	J	11000	650	J	11000	1800	U	1800	680	J	5800
Di-n-octylphthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Dibenz[a,h]anthracene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Dibenzofuran	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Diethylphthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Dimethyl phthalate	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Fluoranthene	11000	U	11000	630	J	11000	1800	U	1800	5800	U	5800
Fluorene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachlorobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachlorobutadiene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachlorocyclopentadiene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Hexachloroethane	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Indeno(1,2,3-cd)pyrene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Isophorone	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
N-Nitroso-di-n-dipropylamine	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
N-Nitrosodiphenylamine	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Naphthalene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Nitrobenzene	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Pentachlorophenol	29000	U	29000	29000	U	29000	4400	U	4400	15000	U	15000
Phenanthrene	11000	U	11000	880	J	11000	1800	U	1800	5800	U	5800
Phenol	11000	U	11000	11000	U	11000	1800	U	1800	5800	U	5800
Pyrene	11000	U	11000	710	J	11000	1800	U	1800	5800	U	5800

Constituent	J00JR7 Test Pit 5 Soil Sample Date 03/21/03			J00JR8 Test Pit 3 Soil Sample Date 03/21/03			J00JR9 Test Pit 4 Soil Sample Date 03/24/03			J00JT3 Test Pit 1 Soil Sample Date 03/24/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls												
Aroclor-1016	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1221	70	U	70	71	U	71	73	U	73	75	U	75
Aroclor-1232	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1242	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1248	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1254	35	U	35	36	U	36	37	U	37	37	U	37
Aroclor-1260	35	U	35	36	U	36	37	U	37	37	U	37
Pesticides												
Aldrin	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
alpha-BHC	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
alpha-Chlordane	2.5		1.8	1.8	U	1.8	4.0		1.8	1.9	U	1.9
beta-BHC	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Constituent	J00JR7 Test Pit 5 Soil Sample Date 03/21/03			J00JR8 Test Pit 3 Soil Sample Date 03/21/03			J00JR9 Test Pit 4 Soil Sample Date 03/24/03			J00JT3 Test Pit 1 Soil Sample Date 03/24/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Pesticides (continued)												
delta-BHC	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Dichlorodiphenyldichloroethane	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Dichlorodiphenyldichloroethylene	16		3.5	3.5	U	3.5	25		3.5	3.7	U	3.7
Dichlorodiphenyltrichloroethane	3.5	U	3.5	3.5	U	3.5	12		3.5	3.7	U	3.7
Dieldrin	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Endosulfan I	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Endosulfan II	3.5	U	3.5	3.5	U	3.5	8.8		3.5	3.7	U	3.7
Endosulfan sulfate	3.5	U	3.5	3.5	U	3.5	15		3.5	3.7	U	3.7
Endrin	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Endrin aldehyde	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
Endrin ketone	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.7	U	3.7
gamma-BHC (Lindane)	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
gamma-Chlordane	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Heptachlor	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Heptachlor epoxide	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8	1.9	U	1.9
Methoxychlor	18	U	18	18	U	18	18	U	18	19	U	19
Toxaphene	180	U	180	180	U	180	180	U	180	190	U	190
Semivolatile Organic Compounds												
1,2,4-Trichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
1,2-Dichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
1,3-Dichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
1,4-Dichlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
2,4,5-Trichlorophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
2,4,6-Trichlorophenol	330	U	330	360	U	360	3700	U	3700	370	U	370
2,4-Dichlorophenol	350	U	350	360	U	360	3700	U	3700	370	U	370
2,4-Dimethylphenol	350	U	350	360	U	360	3700	U	3700	370	U	370
2,4-Dinitrophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
2,4-Dinitrotoluene	350	U	350	360	U	360	3700	U	3700	370	U	370
2,6-Dinitrotoluene	350	U	350	360	U	360	3700	U	3700	370	U	370
2-Chloronaphthalene	330	U	330	360	U	360	3700	U	3700	370	U	370
2-Chlorophenol	350	U	350	360	U	360	3700	U	3700	370	U	370
2-Methylnaphthalene	21	J	350	360	U	360	3700	U	3700	370	U	370
2-Methylphenol (cresol,o-)	350	U	350	360	U	360	3700	U	3700	370	U	370
2-Nitroaniline	880	U	880	890	U	890	9200	U	9200	940	U	940
2-Nitrophenol	350	U	350	360	U	360	3700	U	3700	370	U	370
3+4 Methylphenol (cresol, m+p)	350	U	350	360	U	360	3700	U	3700	370	U	370
3,3'-Dichlorobenzidine	350	U	350	360	U	360	3700	U	3700	370	U	370
3-Nitroaniline	880	U	880	890	U	890	9200	U	9200	940	U	940
4,6-Dinitro-2-methylphenol	880	U	880	890	U	890	9200	U	9200	940	U	940
4-Bromophenylphenyl ether	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Chloro-3-methylphenol	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Chloroaniline	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Chlorophenylphenyl ether	350	U	350	360	U	360	3700	U	3700	370	U	370
4-Nitroaniline	880	U	880	890	U	890	9200	U	9200	940	U	940
4-Nitrophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
Acenaphthene	350	U	350	360	U	360	3700	U	3700	370	U	370
Acenaphthylene	350	U	350	360	U	360	3700	U	3700	370	U	370
Anthracene	350	U	350	360	U	360	3700	U	3700	370	U	370
Benzo(a)anthracene	350	U	350	360	U	360	380	J	3700	370	U	370
Benzo(a)pyrene	350	U	350	360	U	360	370	J	3700	370	U	370
Benzo(b)fluoranthene	350	U	350	360	U	360	280	J	3700	370	U	370
Benzo(ghi)perylene	350	U	350	360	U	360	220	J	3700	370	U	370
Benzo(k)fluoranthene	350	U	350	360	U	360	290	J	3700	370	U	370
Bis(2-chloro-1-methylethyl)ether	350	U	350	360	U	360	3700	U	3700	370	U	370
Bis(2-Chloroethoxy)methane	350	U	350	360	U	360	3700	U	3700	370	U	370
Bis(2-chloroethyl) ether	350	U	350	360	U	360	3700	U	3700	370	U	370
Bis(2-ethylhexyl) phthalate	64	J	350	47	J	360	340	J	3700	49	J	370

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Constituent	J00JR7 Test Pit 5 Soil Sample Date 03/21/03			J00JR8 Test Pit 3 Soil Sample Date 03/21/03			J00JR9 Test Pit 4 Soil Sample Date 03/24/03			J00JT3 Test Pit 1 Soil Sample Date 03/24/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (continued)												
Butylbenzylphthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Carbazole	350	U	350	360	U	360	3700	U	3700	370	U	370
Chrysene	350	U	350	360	U	360	560	J	3700	370	U	370
Di-n-butylphthalate	350	U	350	360	U	360	600	J	3700	370	U	370
Di-n-octylphthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Dibenz[a,h]anthracene	350	U	350	360	U	360	3700	U	3700	370	U	370
Dibenzofuran	350	U	350	360	U	360	3700	U	3700	370	U	370
Diethylphthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Dimethyl phthalate	350	U	350	360	U	360	3700	U	3700	370	U	370
Fluoranthene	350	U	350	360	U	360	880	J	3700	370	U	370
Fluorene	350	U	350	360	U	360	3700	U	3700	370	U	370
Hexachlorobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
Hexachlorobutadiene	350	U	350	360	U	360	3700	U	3700	370	U	370
Hexachlorocyclopentadiene	330	U	330	360	U	360	3700	U	3700	370	U	370
Hexachloroethane	350	U	350	360	U	360	3700	U	3700	370	U	370
Indeno(1,2,3-cd)pyrene	350	U	350	360	U	360	250	J	3700	370	U	370
Isophorone	350	U	350	360	U	360	3700	U	3700	370	U	370
N-Nitroso-di-n-dipropylamine	350	U	350	360	U	360	3700	U	3700	370	U	370
N-Nitrosodiphenylamine	350	U	350	360	U	360	3700	U	3700	370	U	370
Naphthalene	350	U	350	360	U	360	3700	U	3700	370	U	370
Nitrobenzene	350	U	350	360	U	360	3700	U	3700	370	U	370
Pentachlorophenol	880	U	880	890	U	890	9200	U	9200	940	U	940
Phenanthrene	350	U	350	360	U	360	910	J	3700	370	U	370
Phenol	350	U	350	360	U	360	3700	U	3700	370	U	370
Pyrene	350	U	350	360	U	360	1000	J	3700	370	U	370

Constituent	J00JT4 Test Pit 2 Soil Sample Date 03/24/03			J00JT5 Duplicate of J00JT4 Sample Date 03/24/03			J00JT6 Equipment Blank Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls									
Aroclor-1016	37	U	37	37	U	37			
Aroclor-1221	73	U	73	73	U	73			
Aroclor-1232	37	U	37	37	U	37			
Aroclor-1242	37	U	37	37	U	37			
Aroclor-1248	37	U	37	37	U	37			
Aroclor-1254	37	U	37	37	U	37			
Aroclor-1260	37	U	37	37	U	37			
Pesticides									
Aldrin	1.8	U	1.8	1.8	U	1.8			
alpha-BHC	1.8	U	1.8	1.8	U	1.8			
alpha-Chlordane	1.8	U	1.8	1.8	U	1.8			
beta-BHC	1.8	U	1.8	1.8	U	1.8			
delta-BHC	1.8	U	1.8	1.8	U	1.8			
Dichlorodiphenyldichloroethane	3.5	U	3.5	3.5	U	3.5			
Dichlorodiphenyldichloroethylene	7.7		3.5	7.7		3.5			
Dichlorodiphenyltrichloroethane	3.5	U	3.5	3.5	U	3.5			
Dieldrin	3.5	U	3.5	3.5	U	3.5			
Endosulfan I	1.8	U	1.8	1.8	U	1.8			
Endosulfan II	3.5	U	3.5	3.5	U	3.5			
Endosulfan sulfate	3.5	U	3.5	3.5	U	3.5			
Endrin	3.5	U	3.5	3.5	U	3.5			
Endrin aldehyde	3.5	U	3.5	3.5	U	3.5			
Endrin ketone	3.5	U	3.5	3.5	U	3.5			
gamma-BHC (Lindane)	1.8	U	1.8	1.8	U	1.8			
gamma-Chlordane	1.8	U	1.8	1.8	U	1.8			

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Constituent	J00JT4 Test Pit 2 Soil Sample Date 03/24/03			J00JT5 Duplicate of J00JT4 Sample Date 03/24/03			J00JT6 Equipment Blank Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Pesticides (continued)									
Heptachlor	1.8	U	1.8	1.8	U	1.8			
Heptachlor epoxide	1.8	U	1.8	1.8	U	1.8			
Methoxychlor	18	U	18	18	U	18			
Toxaphene	180	U	180	180	U	180			
Semivolatile Organic Compounds									
1,2,4-Trichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
1,2-Dichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
1,3-Dichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
1,4-Dichlorobenzene	3700	U	3700	3700	U	3700	330	U	330
2,4,5-Trichlorophenol	9200	U	9200	9200	U	9200	840	U	840
2,4,6-Trichlorophenol	3700	U	3700	3700	U	3700	330	U	330
2,4-Dichlorophenol	3700	U	3700	3700	U	3700	330	U	330
2,4-Dimethylphenol	3700	U	3700	3700	U	3700	330	U	330
2,4-Dinitrophenol	9200	U	9200	9200	U	9200	840	U	840
2,4-Dinitrotoluene	3700	U	3700	3700	U	3700	330	U	330
2,6-Dinitrotoluene	3700	U	3700	3700	U	3700	330	U	330
2-Chloronaphthalene	3700	U	3700	3700	U	3700	330	U	330
2-Chlorophenol	3700	U	3700	3700	U	3700	330	U	330
2-Methylnaphthalene	3700	U	3700	3700	U	3700	330	U	330
2-Methylphenol (cresol,o-)	3700	U	3700	3700	U	3700	330	U	330
2-Nitroaniline	9200	U	9200	9200	U	9200	840	U	840
2-Nitrophenol	3700	U	3700	3700	U	3700	330	U	330
3+4 Methylphenol (cresol, m+p)	3700	U	3700	3700	U	3700	330	U	330
3,3'-Dichlorobenzidine	3700	U	3700	3700	U	3700	330	U	330
3-Nitroaniline	9200	U	9200	9200	U	9200	840	U	840
4,6-Dinitro-2-methylphenol	9200	U	9200	9200	U	9200	840	U	840
4-Bromophenylphenyl ether	3700	U	3700	3700	U	3700	330	U	330
4-Chloro-3-methylphenol	3700	U	3700	3700	U	3700	330	U	330
4-Chloroaniline	3700	U	3700	3700	U	3700	330	U	330
4-Chlorophenylphenyl ether	3700	U	3700	3700	U	3700	330	U	330
4-Nitroaniline	9200	U	9200	9200	U	9200	840	U	840
4-Nitrophenol	9200	U	9200	9200	U	9200	840	U	840
Acenaphthene	3700	U	3700	3700	U	3700	330	U	330
Acenaphthylene	3700	U	3700	3700	U	3700	330	U	330
Anthracene	3700	U	3700	3700	U	3700	330	U	330
Benzo(a)anthracene	3700	U	3700	3700	U	3700	330	U	330
Benzo(a)pyrene	3700	U	3700	3700	U	3700	330	U	330
Benzo(b)fluoranthene	3700	U	3700	3700	U	3700	330	U	330
Benzo(ghi)perylene	3700	U	3700	3700	U	3700	330	U	330
Benzo(k)fluoranthene	3700	U	3700	3700	U	3700	330	U	330
Bis(2-chloro-1-methylethyl)ether	3700	U	3700	3700	U	3700	330	U	330
Bis(2-Chloroethoxy)methane	3700	U	3700	3700	U	3700	330	U	330
Bis(2-chloroethyl) ether	3700	U	3700	3700	U	3700	330	U	330
Bis(2-ethylhexyl) phthalate	3700	U	3700	3700	U	3700	32	J	330
Butylbenzylphthalate	3700	U	3700	3700	U	3700	330	U	330
Carbazole	3700	U	3700	3700	U	3700	330	U	330
Chrysene	3700	U	3700	3700	U	3700	330	U	330
Di-n-butylphthalate	3700	U	3700	3700	U	3700	330		330
Di-n-octylphthalate	3700	U	3700	3700	U	3700	330	U	330
Dibenz[a,h]anthracene	3700	U	3700	3700	U	3700	330	U	330
Dibenzofuran	3700	U	3700	3700	U	3700	330	U	330
Diethylphthalate	3700	U	3700	3700	U	3700	18	J	330
Dimethyl phthalate	3700	U	3700	3700	U	3700	330	U	330
Fluoranthene	3700	U	3700	3700	U	3700	330	U	330
Fluorene	3700	U	3700	3700	U	3700	330	U	330
Hexachlorobenzene	3700	U	3700	3700	U	3700	330	U	330
Hexachlorobutadiene	3700	U	3700	3700	U	3700	330	U	330

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Constituent	J00JT4 Test Pit 2 Soil Sample Date 03/24/03			J00JT5 Duplicate of J00JT4 Sample Date 03/24/03			J00JT6 Equipment Blank Sample Date 03/21/03		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (continued)									
Hexachlorocyclopentadiene	3700	U	3700	3700	U	3700	330	U	330
Hexachloroethane	3700	U	3700	3700	U	3700	330	U	330
Indeno(1,2,3-cd)pyrene	3700	U	3700	3700	U	3700	330	U	330
Isophorone	3700	U	3700	3700	U	3700	330	U	330
N-Nitroso-di-n-dipropylamine	3700	U	3700	3700	U	3700	330	U	330
N-Nitrosodiphenylamine	3700	U	3700	3700	U	3700	330	U	330
Naphthalene	3700	U	3700	3700	U	3700	330	U	330
Nitrobenzene	3700	U	3700	3700	U	3700	330	U	330
Pentachlorophenol	9200	U	9200	9200	U	9200	840	U	840
Phenanthrene	3700	U	3700	3700	U	3700	330	U	330
Phenol	3700	U	3700	3700	U	3700	330	U	330
Pyrene	3700	U	3700	3700	U	3700	330	U	330

Table A-1. 126-B-3 Confirmatory Data Results. (9 Pages)

Sample Location	HEIS Number	Sample Date	Asbestos Result
Test Pit 1 Soil	J00JV3	3/24/03	None detected
Test Pit 2 Soil	J00JV4	3/24/03	Trace
Duplicate of J00V4	J00JV5	3/24/03	Obvious
Test Pit 3 Soil	J00JM1	3/21/03	None detected
Test Pit 4 Soil	J00JV2	3/24/03	Obvious
Test Pit 4 Gasket	J00JN9	3/21/03	None detected
Test Pit 5 Soil	J00JM0	3/21/03	None detected
Test Pit 5 Fire Brick	J00JN8	3/21/03	None detected
Test Pit 6 Ash	J00JK2	3/21/03	Obvious
Duplicate of J00JK2	J00JK3	3/21/03	Significant
Test Pit 6 Soil	J00JK4	3/21/03	Obvious
Test Pit 6 Debris (wool like)	J00JM2	3/21/03	Significant
Test Pit 6 Tar/mastic	J00JM3	3/21/03	None detected
Test Pit 6 Pipe Lagging	J00JM4	3/21/03	Significant
Test Pit 6 (refractory brick)	J00JM5	3/21/03	Significant

Table A-2. 126-B-3 Confirmatory Data Results - Additional Waste Characterization Analysis. (2 Pages)

Sample Location	HEIS Number	Sample Date	Arsenic (TCLP)			Barium (TCLP)			Cadmium (TCLP)			Chromium (TCLP)			Lead (TCLP)		
			µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL
Test Pit 6 Ash	J00JJ7	3/21/03	21.0	U	21.0	300		0.60	2.4	U	2.4	3.6	U	3.6	15.6	U	15.6
Duplicate of J00JJ7	J00JJ8	3/21/03	21.0	U	21.0	172		0.60	2.4	U	2.4	3.6	U	3.6	15.6	U	15.6
Test Pit 4 Gasket	J00JM6	3/24/03	50.4	U	50.4	35.2		5.6	4.7	UC	4.7	7.9	U	7.9	38.5	U	38.5

Sample Location	HEIS Number	Sample Date	Mercury (TCLP)			Selenium (TCLP)			Silver (TCLP)		
			µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL
Test Pit 6 Ash	J00JJ7	3/21/03	0.10	U	0.10	21.6	U	21.6	4.8	U	4.8
Duplicate of J00JJ7	J00JJ8	3/21/03	0.10	U	0.10	21.6	U	21.6	4.8	U	4.8
Test Pit 4 Gasket	J00JM6	3/24/03	0.10	U	0.10	70.3	U	70.3	6.3	U	6.3

Sample Location	HEIS Number	Sample Date	Cyanide			Sulfide		
			mg/kg	Q	PQL	mg/kg	Q	PQL
Test Pit 2 Soil	J00JT4	03/24/03	0.55	U	0.55	20.0	U	20.0
Duplicate of J00JT4	J00JT5	03/24/03	0.55	U	0.55	23.7	U	23.7
Test Pit 4 Soil	J00JR9	03/24/03	0.51	U	0.51	19.3	U	19.3
Test Pit 4 Gasket	J00JM6	03/24/03	1.87	U	1.87	162	U	162
Test Pit 6 Ash	J00JJ7	03/21/03	0.57	U	0.57	43.0	U	43.0
Duplicate of J00JJ7	J00JJ8	03/21/03	0.46	U	0.46	44.6	U	44.6

Sample Location	HEIS Number	Sample Date	1,4-Dichlorobenzene (TCLP)			2,4,5-Trichlorophenol (TCLP)			2,4,6-Trichlorophenol (TCLP)			2,4-Dinitrotoluene (TCLP)			2-Methylphenol (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Test Pit 6 Ash	J00JJ7	03/21/03	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Duplicate of J00JJ7	J00JJ8	03/21/03	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Test Pit 4 Gasket	J00JM6	03/24/03	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Test Pit 4 Soil	J00JR9	03/24/03	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Test Pit 2 Soil	J00JT4	03/24/03	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Duplicate of J00JT4	J00JT5	03/24/03	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050

Table A-2. 126-B-3 Confirmatory Data Results - Additional Waste Characterization Analysis. (2 Pages)

Sample Location	HEIS Number	Sample Date	3+4-Methylphenol (TCLP)			Hexachlorobenzene (TCLP)			Hexachlorobutadiene (TCLP)			Hexachloroethane (TCLP)			Nitrobenzene (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Test Pit 6 Ash	J00JJ7	03/21/03	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Duplicate of J00JJ7	J00JJ8	03/21/03	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Test Pit 4 Gasket	J00JM6	03/24/03	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Test Pit 4 Soil	J00JR9	03/24/03	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Test Pit 2 Soil	J00JT4	03/24/03	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Duplicate of J00JT4	J00JT5	03/24/03	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050

Sample Location	HEIS Number	Sample Date	Pentachlorophenol (TCLP)			Pyridine (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL
Test Pit 6 Ash	J00JJ7	03/21/03	0.12	U	0.12	0.050	U	0.050
Duplicate of J00JJ7	J00JJ8	03/21/03	0.12	U	0.12	0.050	U	0.050
Test Pit 4 Gasket	J00JM6	03/24/03	0.12	U	0.12	0.050	U	0.050
Test Pit 4 Soil	J00JR9	03/24/03	0.12	U	0.12	0.050	U	0.050
Test Pit 2 Soil	J00JT4	03/24/03	0.12	U	0.12	0.050	U	0.050
Duplicate of J00JT4	J00JT5	03/24/03	0.12	U	0.12	0.050	U	0.050

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pink Paint	J00YB7	9/17/03							2.6	U	2.6	7760	C	0.12							5.1		0.25
Yellow Paint	J00YB8	9/17/03							4.3		23.6	160	C	0.12							3.6		0.25
Paint	J01786	1/22/04							7.8		0.28	187		2.1							3.6		0.25
Soil below batteries	J01YT4	10/28/04							6.2		0.35	127		0.01							0.03	U	0.03
Suspect diesel spill	J022F6	11/19/04				0.28	U	0.28	3.1		0.3	45	C	0.02	0.38		0.01				0.03	UC	0.03
Yellow/brown stain	J030D1	3/28/05							4.8		0.3	99.2	C	0.02							0.17		0.04
Rusty soil	J030K1	4/6/05	6080	C	1.0	0.64		0.2	7.9		0.3	92.2	C	0.02	0.18		0.01	2.6		0.2	0.20		0.04
Rusty soil	J030K2	4/6/05	7980	C	1.0	1.0		0.2	8.8		0.3	118	C	0.02	0.26		0.01	5.2		0.2	0.20		0.04
Greenish soil (100-B-27)	J030K6	4/6/05	6970	C	1.0	0.21	U	0.21	4		0.3	69.5	C	0.02	0.26		0.01	2.2		0.2	0.04	U	0.04
Soil	J03CP6	6/15/05							3.0		0.43	66.1		0.02							0.11		0.03
Soil	J03CP7	6/15/05							4.5		0.4	70.0		0.02							0.12		0.03
Paint	J03CN7	6/14/05							414		2.5	1540		0.11							68		0.17

Sample Location	HEIS Number	Sample Date	Calcium			Chromium			Cobalt			Copper			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pink Paint	J00YB7	9/17/03				4960	C	0.61										30800	C	1.2			
Yellow Paint	J00YB8	9/17/03				24200	C	2.5										129000	C	4.7			
Paint	J01786	1/22/04				20800		0.31										74100		1.3			
Soil below batteries	J01YT4	10/28/04				11.3		0.06										7.9		0.26			
Suspect diesel spill	J022F6	11/19/04				4.2		0.04										2.6		0.2			
Yellow/brown stain	J030D1	3/28/05				13.5		0.04										7.8		0.2			
Rusty soil	J030K1	4/6/05	10200	C	1	12.8	C	0.04	7.6		0.1	36.3		0.05	40300	C	1	50.7		0.2	3540	C	1
Rusty soil	J030K2	4/6/05	9250	C	1	25.6	C	0.04	9.8		0.1	47.4		0.05	32500	C	1	35.7		0.2	4660	C	1
Greenish soil (100-B-27)	J030K6	4/6/05	9450	C	1	580	C	0.04	9.2		0.1	17.8		0.05	24300	C	1	5.4		0.2	5680	C	1
Soil	J03CP6	6/15/05				86.9		0.07										4.8		0.24			
Soil	J03CP7	6/15/05				138		0.06										6.2		0.22			
Paint	J03CN7	6/14/05				2710		0.39										31400		1.4			

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium			Selenium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pink Paint	J00YB7	9/17/03																3.7		1.8			
Yellow Paint	J00YB8	9/17/03																1.8	U	1.8			
Paint	J01786	1/22/04				10.4		0.18										2.1	U	2.1			
Soil below batteries	J01YT4	10/28/04				0.02	U	0.02										0.36	U	0.36			
Suspect diesel spill	J022F6	11/19/04				0.02	U	0.02				6.8		0.1				0.37	U	0.37			
Yellow/brown stain	J030D1	3/28/05																0.73		0.5			
Rusty soil	J030K1	4/6/05	213	C	0.02	0.03		0.02	2.0		0.2	11.2		0.1	1700	C	1	0.42	U	0.42	249		
Rusty soil	J030K2	4/6/05	266	C	0.02	0.03		0.02	1.5		0.2	16.3		0.1	1570	C	1	0.38	U	0.38	266		
Greenish soil (100-B-27)	J030K6	4/6/05	371	C	0.02	0.02	U	0.02	0.54		0.2	12.8		0.1	1310	C	1	0.38	U	0.38	176		
Soil	J03CP6	6/15/05				0.02	U	0.02										0.47	U	0.47			
Soil	J03CP7	6/15/05				0.01	U	0.01										0.44	U	0.44			
Paint	J03CN7	6/14/05																2.7	U	2.7			

Sample Location	HEIS Number	Sample Date	Silver			Sodium			Thallium			Vanadium			Zinc			Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Pink Paint	J00YB7	9/17/03	1.2		0.49															
Yellow Paint	J00YB8	9/17/03	1.0		0.49															
Paint	J01786	1/22/04	0.94		0.38															
Soil below batteries	J01YT4	10/28/04	0.10	U	0.10															
Suspect diesel spill	J022F6	11/19/04	0.10	U	0.10				0.48	U	0.48							34.8	U	34.8
Yellow/brown stain	J030D1	3/28/05	0.05	U	0.05															
Rusty soil	J030K1	4/6/05	0.83		0.10	652	C	0.2				52.3		0.1	58.9	C	0.05			
Rusty soil	J030K2	4/6/05	0.38		0.38	448	C	0.2				43.4		0.1	79.6	C	0.05			
Greenish soil (100-B-27)	J030K6	4/6/05	0.05	U	0.05	435	C	0.2				64.4		0.1	51	C	0.05			
Soil	J03CP6	6/15/05	0.09	U	0.09															
Soil	J03CP7	6/15/05	0.08	U	0.08															
Paint	J03CN7	6/14/05	4.2		0.5															

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Arsenic (TCLP)			Barium (TCLP)			Cadmium (TCLP)			Chromium (TCLP)			Lead (TCLP)			Mercury (TCLP)			Selenium (TCLP)			Silver (TCLP)		
			µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL
Paint	J01786	1/22/04	19.7		17.0	812		1.0	122		2.0	298		2.5	12500		10	1.0	U	1.0	17.0	U	17.0	3.0	U	3.0
Suspect diesel spill	J022F6	11/19/04	15.6	U	15.6	122		3.0	1.8	U	1.8	4.8	U	4.8	13.2	U	13.2	0.20	U	0.20	22.2	U	22.2	6.0	U	6.0
Soil	J03CP6	6/15/05	27.0	U	27.0	275		1.2	1.8	U	1.8	867		4.2	15.0	U	15.0	0.10	U	0.10	29.4	U	29.4	5.4	U	5.4
Soil	J03CP7	6/15/05	27.0	U	27.0	358		1.2	1.8	U	1.8	2900		4.2	15.0	U	15.0	0.10	U	0.10	29.4	U	29.4	5.4	U	5.4
Paint	J03CN7	6/14/05	30.5	U	30.5	445		2.6	540		4.7	69.6		10.8	96600		32.7	0.10	U	0.10	48.5	U	48.5	5.6	U	5.6
Brown liquid and absorbent	J02J07	2/18/05	17.4	U	17.4	291	C	3.0	21.1		2.5	2.4	UC	2.4	11.4	U	12.0	0.10	U	0.10	137		24.0	3.0	U	3.0
Bagged pipe/soil	J02J08	2/18/05	17.4	U	17.4	587	C	3.0	2.4	U	2.4	3.2	C	2.4	14.6		12.0	0.13		0.10	24	U	24.0	3.0	U	3.0
Yellow/brown stain	J030D1	3/28/05	17.4	U	17.4	86.8	C	3.0	2.9		2.5	3.5	C	2.4	11.4	U	11.4	0.10	U	0.10	24	U	24.0	3.0	U	3.0
Rusty soil	J030K1	4/6/05	23.0		18.0	22.1	C	3.0	2.4	U	2.4	4.4	C	2.4	11.4	U	11.4	0.10	U	0.10	24	U	24.0	3.0	U	3.0
Rusty soil	J030K2	4/6/05	22.3		18.0	115	C	3.0	2.4	U	2.4	2.4	UC	2.4	11.4	U	11.4	0.10	U	0.10	24	U	24.0	3.0	U	3.0
Greenish soil (100-B-27)	J030K6	4/6/05	17.4	U	17.4	263	C	3.0	17.8		2.5	15900	C	2.4	11.4	U	11.4	0.10	U	0.10	24	U	24.0	3.0	U	3.0

Sample Location	HEIS Number	Sample Date	1,4-Dichloro benzene (TCLP)			2,4,5-Trichloro phenol (TCLP)			2,4,6-Trichloro phenol (TCLP)			2,4-Dinitro toluene (TCLP)			2-Methylphenol (TCLP)			3+4-Methylphenol (TCLP)			Hexachloro benzene (TCLP)			Hexachloro butadiene (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Suspect diesel spill	J022F6	11/19/04	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Bagged pipe/soil	J02J08	2/18/05	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Yellow/brown stain	J030D1	3/28/05	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Rusty soil	J030K1	4/6/05	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Rusty soil	J030K2	4/6/05	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050
Greenish soil (100-B-27)	J030K6	4/6/05	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050	0.050	U	0.050

Sample Location	HEIS Number	Sample Date	Hexachloroethane (TCLP)			Nitrobenzene (TCLP)			Pentachloro phenol (TCLP)			Pyridine (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
Suspect diesel spill	J022F6	11/19/04	0.050	U	0.050	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050
Bagged pipe/soil	J02J08	2/18/05	0.050	U	0.050	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050
Yellow/brown stain	J030D1	3/28/05	0.050	U	0.050	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050
Rusty soil	J030K1	4/6/05	0.050	U	0.050	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050
Rusty soil	J030K2	4/6/05	0.050	U	0.050	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050
Greenish soil (100-B-27)	J030K6	4/6/05	0.050	U	0.050	0.050	U	0.050	0.12	U	0.12	0.050	U	0.050

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Constituent	J022F6 Suspect diesel spill Sample Date 11/19/04			J02J08 Bagged pipe/soil Sample Date 02/18/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls						
Aroclor-1016	14	U	14	39	U	39
Aroclor-1221	14	U	14	39	U	39
Aroclor-1232	14	U	14	39	U	39
Aroclor-1242	14	U	14	39	U	39
Aroclor-1248	14	U	14	39	U	39
Aroclor-1254	14	U	14	39	U	39
Aroclor-1260	14	U	14	100		39
Pesticides						
Aldrin	1.7	U	1.7			
alpha-BHC	1.7	U	1.7			
alpha-Chlordane	1.7	U	1.7			
beta-BHC	1.7	U	1.7			
delta-BHC	1.7	U	1.7			
Dichlorodiphenyldichloroethane	3.5	U	3.5			
Dichlorodiphenyldichloroethylene	3.5	U	3.5			
Dichlorodiphenyltrichloroethane	3.5	U	3.5			
Dieldrin	3.5	U	3.5			
Endosulfan I	1.7	U	1.7			
Endosulfan II	3.5	U	3.5			
Endosulfan sulfate	3.5	U	3.5			
Endrin	3.5	U	3.5			
Endrin aldehyde	3.5	U	3.5			
Endrin ketone	3.5	U	3.5			
gamma-BHC (Lindane)	1.7	U	1.7			
gamma-Chlordane	1.7	U	1.7			
Heptachlor	1.7	U	1.7			
Heptachlor epoxide	1.7	U	1.7			
Methoxychlor	17	U	17			
Toxaphene	170	U	170			

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Constituent	J022F6 Suspect diesel spill Sample Date 11/19/04			J030D1 Yellow/brown stain Sample Date 3/28/05			J030K1 Rusty soil Sample Date 4/6/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds									
1,2,4-Trichlorobenzene	350	U	350	360	U	360	740	U	740
1,2-Dichlorobenzene	350	U	350	360	U	360	740	U	740
1,3-Dichlorobenzene	350	U	350	360	U	360	740	U	740
1,4-Dichlorobenzene	350	U	350	360	U	360	740	U	740
2,4,5-Trichlorophenol	870	U	870	910	U	910	1800	U	1800
2,4,6-Trichlorophenol	350	U	350	360	U	360	740	U	740
2,4-Dichlorophenol	350	U	350	360	U	360	740	U	740
2,4-Dimethylphenol	350	U	350	360	U	360	740	U	740
2,4-Dinitrophenol	870	U	870	910	U	910	1800	U	1800
2,4-Dinitrotoluene	350	U	350	360	U	360	740	U	740
2,6-Dinitrotoluene	350	U	350	360	U	360	740	U	740
2-Chloronaphthalene	350	U	350	360	U	360	740	U	740
2-Chlorophenol	350	U	350	360	U	360	740	U	740
2-Methylnaphthalene	350	U	350	360	U	360	740	U	740
2-Methylphenol (cresol,o-)	350	U	350	360	U	360	740	U	740
2-Nitroaniline	870	U	870	910	U	910	1800	U	1800
2-Nitrophenol	350	U	350	360	U	360	740	U	740
3+4 Methylphenol (cresol, m+p)	350	U	350	360	U	360	740	U	740
3,3'-Dichlorobenzidine	350	U	350	360	U	360	740	U	740
3-Nitroaniline	870	U	870	910	U	910	1800	U	1800
4,6-Dinitro-2-methylphenol	870	U	870	910	U	910	1800	U	1800
4-Bromophenylphenyl ether	350	U	350	360	U	360	740	U	740
4-Chloro-3-methylphenol	350	U	350	360	U	360	740	U	740
4-Chloroaniline	350	U	350	360	U	360	740	U	740
4-Chlorophenylphenyl ether	350	U	350	360	U	360	740	U	740
4-Nitroaniline	870	U	870	910	U	910	1800	U	1800
4-Nitrophenol	870	U	870	910	U	910	1800	U	1800
Acenaphthene	350	U	350	360	U	360	740	U	740
Acenaphthylene	350	U	350	360	U	360	740	U	740
Anthracene	350	U	350	360	U	360	740	U	740
Benzo(a)anthracene	350	U	350	23	J	360	740	U	740
Benzo(a)pyrene	350	U	350	20	J	360	59	J	740
Benzo(b)fluoranthene	350	U	350	20	J	360	72	J	740
Benzo(ghi)perylene	350	U	350	360	U	360	80	J	740
Benzo(k)fluoranthene	350	U	350	360	U	360	49	J	740
bis(2-Chloro-1-methylethyl)ether	350	U	350	360	U	360	740	U	740
bis(2-Chloroethoxy)methane	350	U	350	360	U	360	740	U	740
bis(2-chloroethyl) ether	350	U	350	360	U	360	740	U	740
bis(2-ethylhexyl) phthalate	18	JB	350	47	JB	360	44	JB	740
Butylbenzylphthalate	350	U	350	360	U	360	740	U	740
Carbazole	350	U	350	360	U	360	740	U	740
Chrysene	350	U	350	28	J	360	62	J	740
Di-n-butylphthalate	350	U	350	360	U	360	740	U	740
Di-n-octylphthalate	350	U	350	360	U	360	740	U	740
Dibenz[a,h]anthracene	350	U	350	360	U	360	740	U	740
Dibenzofuran	350	U	350	360	U	360	740	U	740
Diethylphthalate	350	U	350	360	U	360	740	U	740
Dimethyl phthalate	350	U	350	360	U	360	740	U	740
Fluoranthene	350	U	350	48	J	360	60	J	740

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Constituent	J022F6 Suspect diesel spill Sample Date 11/19/04			J030D1 Yellow/brown stain Sample Date 3/28/05			J030K1 Rusty soil Sample Date 4/6/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (continued)									
Fluorene	350	U	350	360	U	360	740	U	740
Hexachlorobenzene	350	U	350	360	U	360	740	U	740
Hexachlorobutadiene	350	U	350	360	U	360	740	U	740
Hexachlorocyclopentadiene	350	U	350	360	U	360	740	U	740
Hexachloroethane	350	U	350	360	U	360	740	U	740
Indeno(1,2,3-cd)pyrene	350	U	350	360	U	360	59	J	740
Isophorone	350	U	350	360	U	360	740	U	740
N-Nitroso-di-n-dipropylamine	350	U	350	360	U	360	740	U	740
N-Nitrosodiphenylamine	350	U	350	360	U	360	740	U	740
Naphthalene	350	U	350	360	U	360	740	U	740
Nitrobenzene	350	U	350	360	U	360	740	U	740
Pentachlorophenol	870	U	870	910	U	910	1800	U	1800
Phenanthrene	350	U	350	37	J	360	40	J	740
Phenol	350	U	350	360	U	360	740	U	740
Pyrene	350	U	350	49	J	360	64	J	740

Constituent	J030K2 Rusty soil Sample Date 4/6/05			J030K6 Greenish soil Sample Date 4/6/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	740	U	740	360	U	360
1,2-Dichlorobenzene	740	U	740	360	U	360
1,3-Dichlorobenzene	740	U	740	360	U	360
1,4-Dichlorobenzene	740	U	740	360	U	360
2,4,5-Trichlorophenol	1900	U	1900	890	U	890
2,4,6-Trichlorophenol	740	U	740	360	U	360
2,4-Dichlorophenol	740	U	740	360	U	360
2,4-Dimethylphenol	740	U	740	360	U	360
2,4-Dinitrophenol	1900	U	1900	890	U	890
2,4-Dinitrotoluene	740	U	740	360	U	360
2,6-Dinitrotoluene	740	U	740	360	U	360
2-Chloronaphthalene	740	U	740	360	U	360
2-Chlorophenol	740	U	740	360	U	360
2-Methylnaphthalene	130	J	740	69	J	360
2-Methylphenol (cresol,o-)	740	U	740	360	U	360
2-Nitroaniline	1900	U	1900	890	U	890
2-Nitrophenol	740	U	740	360	U	360
3+4 Methylphenol (cresol, m+p)	740	U	740	360	U	360
3,3'-Dichlorobenzidine	740	U	740	360	U	360
3-Nitroaniline	1900	U	1900	890	U	890
4,6-Dinitro-2-methylphenol	1900	U	1900	890	U	890
4-Bromophenylphenyl ether	740	U	740	360	U	360
4-Chloro-3-methylphenol	740	U	740	360	U	360
4-Chloroaniline	740	U	740	360	U	360
4-Chlorophenylphenyl ether	740	U	740	360	U	360
4-Nitroaniline	1900	U	1900	890	U	890
4-Nitrophenol	1900	U	1900	890	U	890

Table A-3. 126-B-3 Waste Characterization and In-Process Data Results. (7 Pages)

Constituent	J030K2 Rusty soil Sample Date 4/6/05			J030K6 Greenish soil Sample Date 4/6/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (continued)						
Acenaphthene	740	U	740	360	U	360
Acenaphthylene	740	U	740	360	U	360
Anthracene	740	U	740	22	J	360
Benzo(a)anthracene	740	U	740	46	J	360
Benzo(a)pyrene	71	J	740	34	J	360
Benzo(b)fluoranthene	76	J	740	28	J	360
Benzo(ghi)perylene	110	J	740	360	U	360
Benzo(k)fluoranthene	41	J	740	31	J	360
bis(2-Chloro-1-methylethyl)ether	740	U	740	360	U	360
bis(2-Chloroethoxy)methane	740	U	740	360	U	360
bis(2-chloroethyl) ether	740	U	740	360	U	360
bis(2-ethylhexyl) phthalate	740	U	740	46	JB	360
Butylbenzylphthalate	740	U	740	360	U	360
Carbazole	740	U	740	360	U	360
Chrysene	67	J	740	49	J	360
Di-n-butylphthalate	740	U	740	29	JB	360
Di-n-octylphthalate	740	U	740	360	U	360
Dibenz[a,h]anthracene	53	J	740	360	U	360
Dibenzofuran	740	U	740	360	U	360
Diethylphthalate	740	U	740	360	U	360
Dimethyl phthalate	740	U	740	360	U	360
Fluoranthene	49	J	740	110	J	360
Fluorene	740	U	740	360	U	360
Hexachlorobenzene	740	U	740	360	U	360
Hexachlorobutadiene	740	U	740	360	U	360
Hexachlorocyclopentadiene	740	U	740	360	U	360
Hexachloroethane	740	U	740	360	U	360
Indeno(1,2,3-cd)pyrene	89	J	740	360	U	360
Isophorone	740	U	740	360	U	360
N-Nitroso-di-n-dipropylamine	740	U	740	360	U	360
N-Nitrosodiphenylamine	740	U	740	360	U	360
Naphthalene	86	J	740	43	J	360
Nitrobenzene	740	U	740	360	U	360
Pentachlorophenol	1900	U	1900	890	U	890
Phenanthrene	94	J	740	97	J	360
Phenol	740	U	740	360	U	360
Pyrene	110	J	740	110	J	360

Table A-4. 126-B-3 In-Process Data Results - Excavation Guidance.

Sample Location	HEIS Number	Sample Date	Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL
126-B-3 Excavation	J024M0	11/29/04	881		35.0
126-B-3 Excavation	J024M1	11/29/04	35.4	U	35.4
126-B-3 Excavation	J024M2	11/29/04	34.2	U	34.2
126-B-3 Excavation	J024M3	11/29/04	34.3	U	34.3
126-B-3 Excavation	J024M4	11/29/04	34.2	U	34.2
126-B-3 Excavation	J024M5	11/29/04	36.4	U	36.4

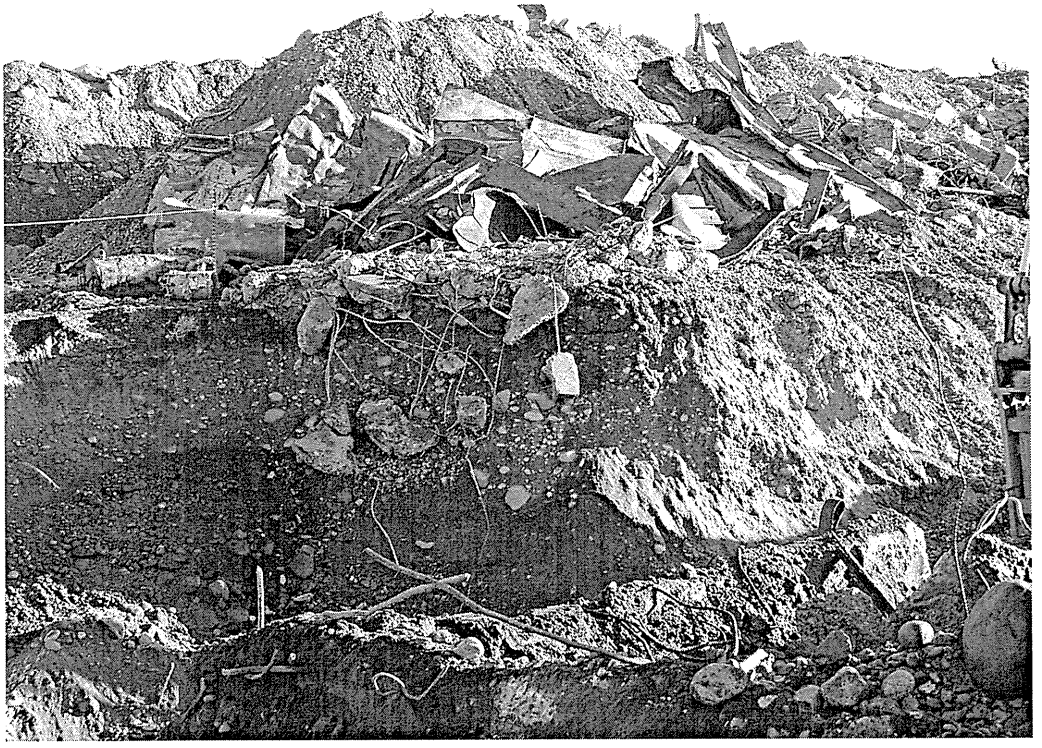
Table A-5. 126-B-3 Pilot Study Data Results.

Sample Location	HEIS Number	Sample Date	Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL
126-B-3 Excavation	J025R3	12/14/04	36.8	U	36.8
126-B-3 Excavation	J025R4	12/15/04	36.2	U	36.2
126-B-3 Excavation	J025R5	12/15/04	51.4		35
126-B-3 Excavation	J025R6	12/15/04	34.6	U	34.6
126-B-3 Excavation	J025R7	12/15/04	35	U	35
126-B-3 Excavation	J025R8	12/15/04	37.2	U	37.2
126-B-3 Excavation	J025R9	12/15/04	35.8	U	35.8
126-B-3 Excavation	J025T0	12/15/04	35.8	U	35.8
126-B-3 Excavation	J025T1	12/15/04	34.5	U	34.5
126-B-3 Excavation	J025T2	12/15/04	35.7	U	35.7
126-B-3 Excavation	J025T3	12/15/04	35	U	35
126-B-3 Excavation	J025T4	12/15/04	36.1	U	36.1
126-B-3 Excavation	J025T5	12/15/04	35.4	U	35.4
126-B-3 Excavation	J025T6	12/15/04	35.2	U	35.2
126-B-3 Excavation	J025T7	12/15/04	35.1	U	35.1
126-B-3 Excavation	J025T8	12/15/04	35.3	U	35.3
126-B-3 Excavation	J025T9	12/15/04	35	U	35
126-B-3 Excavation	J025V0	12/15/04	35.7	U	35.7
126-B-3 Excavation	J025V1	12/15/04	34.7	U	34.7
126-B-3 Excavation	J025V2	12/15/04	35.7	U	35.7

APPENDIX B

SITE REMEDIATION PHOTOGRAPHS

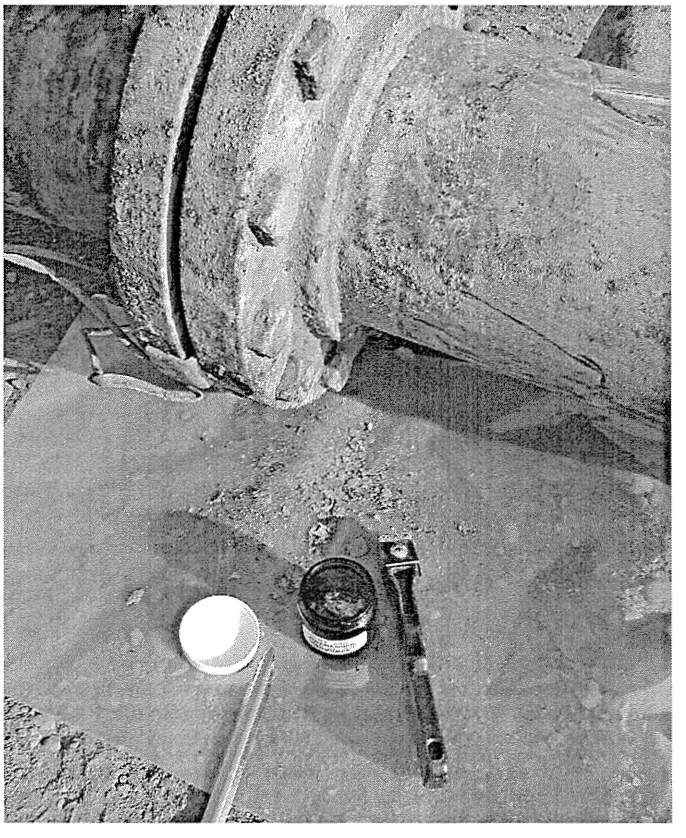
Photograph B-1. Excavated soil and debris removed from the 126-B-3 excavation and staged for disposal.



Photograph B-2. Batteries located at the 126-B-3 waste site.

Photograph B-3. Painted metal debris.

Photograph B-4. Collection of paint sample from debris.



Photograph B-5. Painted metal debris.

Photograph B-6. Suspect drywell discovered in the 126-B-3 eastern staging pile footprint.

APPENDIX C

CALCULATION OF 95% UCL VALUES FOR VERIFICATION DATA

CALCULATION COVER SHEET

Project Title:	100 B/C Remedial Action Project	**Job No.**	22192
Area	100 B/C		
Discipline	Environmental	***Calc. No.**	0100B-CA-V0260
Subject	126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations		
Computer Program	Excel	**Program No.**	Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These documents 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 = 8 Attm. 1 = 13 Total = 22	8/23/05 J. M. Capron	T. M. Blakley 8/23/05 T. B. Miley 8-24-05	L. M. Dittmer 8/24/05	D. N. Strom	8-25-05

SUMMARY OF REVISIONS

* Obtain calc no. from DIS

DE01437.03 (12/09/2004)

Bechtel Hanford, Inc. CALCULATION SHEET

Originator J. M. Capron JMC Date 08/23/05 Calc. No. 0100B-CA-V0260 Rev. No. 0
Project 100 B/C Remedial Action Project Job No. 22192 Checked T. M. Blakley TMB Date 8/23/05
Checked T. B. Miley TBM Date 8.24.05
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations Sheet No. 1 of 8

Summary

Purpose:
Calculate the 95% upper confidence limit (UCL) 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 all nonradionuclide analytes and calculate the relative percent difference (RPD) for each contaminant of concern (COC) and contaminant of potential concern (COPC).

Table of Contents:

Given/References:

1) Sample Results (Attachment 1)
2) Lookup values, background values, and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets),* Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-94/013, U.S. Environmental Protection Agency, Washington, D.C.
10) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Adminstration Code.*

Solution:
Calculation methodology is described in Ecology (1992, 1993), below, and in the RDR/RAWP (DOE-RL 2005b). 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 and COPC. The carcinogenic risk calculations are located in a seperate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:
The subject calculations were performed on data from soil verification samples from the subject 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 DOE-RL (2005b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:
For all nonradioactive analytes with > 50% of the data below detection limits, the statistical value was set equal to the maximum detected concentration from the sample data set. The evaluation of the portion of the data set below detection limits was performed based on direct inspection of the final validated laboratory data and further calculations were not performed. For nonradioactive analytes with < 50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup was the 95% UCL. For these data sets, all data reported as being below detection limits were set to ½ the detection limit value for calculation of the statistics (Ecology 1993). There are no radionuclide COCs/COPCs for this site.

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 large nonradionuclide data sets such as those for the 126-B-3 site (n > 10), distributional testing is done using Ecology's MTCAStat software (Ecology 1993).

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 nonradionuclide COC/COPC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each nonradionuclide COC/COPC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each nonradionuclide COC/COPC.

The RPD is performed when both the main value and the duplicate 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. These detection limit requirements are located in Table II.1 of the SAP (DOE-RL 2005a). 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. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for regulatory split data), further investigation regarding the usability of the data is performed. No regulatory split samples were collected for cleanup verification of the subject site. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

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Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations Sheet No. 2 of 8

Summary (continued)

Results:
The results presented in the summary tables that follow are for use in risk analysis and the RSVP for this site.

Results Summary

Analyte	95% UCL[a]	Maximum[a]	Units
Arsenic	5.9E+00		mg/kg
Barium	9.34E+01		mg/kg
Beryllium	5.6E-01		mg/kg
Boron	4.9E+00		mg/kg
Cadmium	3.0E-01		mg/kg
Chromium	1.22E+01		mg/kg
Cobalt	1.16E+01		mg/kg
Copper	2.34E+01		mg/kg
Lead	8.3E+00		mg/kg
Manganese	4.67E+02		mg/kg
Mercury		3.E-02	mg/kg
Molybdenum		1.4E+00	mg/kg
Nickel	1.59E+01		mg/kg
Vanadium	6.69E+01		mg/kg
Zinc	6.24E+01		mg/kg
Aroclor-1260		1.7E-02	mg/kg
1,2,4-trichlorobenzene		5.2E-02	mg/kg
2-methylnaphthalene		3.9E-01	mg/kg
Acenaphthene		5.5E-02	mg/kg
Anthracene		1.5E-01	mg/kg
Benzo(a)anthracene		3.5E-01	mg/kg
Benzo(a)pyrene		2.8E-01	mg/kg
Benzo(b)fluoranthene		1.9E-01	mg/kg
Benzo(g,h,i)perylene		1.7E-01	mg/kg
Benzo(k)fluoranthene		2.4E-01	mg/kg
Carbazole		7.5E-02	mg/kg
Chrysene		3.7E-01	mg/kg
Dibenz(a,h)anthracene		8.8E-02	mg/kg
Dibenzofuran		9.9E-02	mg/kg
Diethylphthalate		4.1E-02	mg/kg
Fluoranthene		7.3E-01	mg/kg
Fluorene		7.1E-02	mg/kg
Indeno(1,2,3-cd)pyrene		1.6E-01	mg/kg
N-nitrosodiphenylamine		1.0E-01	mg/kg
Naphthalene		1.2E-01	mg/kg
Phenanthrene		6.2E-01	mg/kg
Pyrene		7.0E-01	mg/kg

WAC 173-340-740(7)(e) Evaluation

WAC 3-Part Test for most stringent cleanup limit:

95% UCL > Cleanup Limit?	YES
> 10% above Cleanup Limit?	YES
Any sample > 2x Cleanup Limit?	NO

Because of the "yes" answers to the MTCA 3-part test for multiple contaminants, a detailed assessment using RESRAD will be performed for those contaminants.

Note: All data sets meet the 3-part test criteria when compared to direct exposure cleanup limits.

[a]Where less than 50% of a data set is censored (below detection limits), the 95% UCL value is used for a given analyte. Where greater than 50% of a data set is censored, the statistical value defaults to the maximum value in the data set (determined by direct inspection of the attached data).

Relative Percent Difference (RPD) Results* - QA/QC Analysis

Analyte	Duplicate Analysis
Barium	8.3%
Chromium	5.3%
Cobalt	6.2%
Copper	5.4%
Manganese	7.8%
Vanadium	16%
Zinc	28%

*RPD evaluation was not required for analytes not included in this table

MTCA = *Model Toxic Control Act*
QA/QC = quality assurance/quality control
RESRAD = RESidual RADioactivity
RPD = relative percent difference
UCL = upper confidence level
WAC = *Washington Adminstrative Code*

Bechtel Hanford, Inc.

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Project 100 B/C Remedial Action Project
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations

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Shallow Zone Sample Data

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Q	Arsenic PQL	Barium mg/kg	Q	Barium PQL	Beryllium mg/kg	Q	Beryllium PQL	Boron mg/kg	Q	Boron PQL	Cadmium mg/kg	Q	Cadmium PQL	Chromium mg/kg	Q	Chromium PQL	Cobalt mg/kg	Q	Cobalt PQL
1	J030P3	4/15/05	5.1E+00		1.9E+00	8.75E+01		1.3E-01	4.9E-01		7.E-02	5.4E+00		1.1E+00	4.1E-01		2.6E-01	1.55E+01		2.6E-01	1.18E+01		4.6E-01
2	J030P4	4/15/05	1.5E+00		1.4E+00	5.93E+01		1.E-01	3.1E-01		5.E-02	1.5E+00	UJ	1.5E+00	2.0E-01	U	2.0E-01	4.9E+00		2.0E-01	9.1E+00		3.5E-01
3	J030P5	4/15/05	3.0E+00		1.6E+00	7.09E+01		1.1E-01	4.6E-01		6.E-02	2.1E+00		9.4E-01	3.3E-01		2.2E-01	9.8E+00		2.2E-01	1.06E+01		3.9E-01
4	J030P6	4/15/05	6.2E+00		1.8E+00	1.30E+02		1.3E-01	5.8E-01		6.E-02	4.2E+00		1.1E+00	3.7E-01		2.5E-01	1.56E+01		2.5E-01	1.28E+01		4.4E-01
5	J030P7	4/15/05	2.7E+00		1.6E+00	7.51E+01		1.1E-01	4.3E-01		6.E-02	7.8E+00		9.5E-01	3.4E-01		2.2E-01	1.10E+01		2.2E-01	1.00E+01		3.9E-01
6	J030P8	4/15/05	4.1E+00		1.3E+00	5.49E+01		9.E-02	4.7E-01		5.E-02	4.5E+00		7.8E-01	1.8E-01	U	1.8E-01	5.0E+00		1.8E-01	1.01E+01		3.2E-01
7	J030P9	4/15/05	4.0E+00		1.6E+00	5.71E+01		1.1E-01	5.1E-01		5.E-02	3.6E+00		9.1E-01	2.1E-01	U	2.1E-01	4.1E+00		2.1E-01	1.02E+01		3.8E-01
8	J030R0	4/15/05	8.1E+00		1.6E+00	6.79E+01		1.1E-01	5.4E-01		5.E-02	3.8E+00		9.2E-01	2.2E-01	U	2.2E-01	5.5E+00		2.2E-01	1.10E+01		3.8E-01
9	J030R1	4/15/05	4.4E+00		1.7E+00	9.09E+01		1.2E-01	6.1E-01		6.E-02	5.2E+00		9.8E-01	2.3E-01	U	2.3E-01	6.6E+00		2.3E-01	1.12E+01		4.0E-01
10	J030R2	4/15/05	4.1E+00		1.7E+00	7.11E+01		1.2E-01	5.6E-01		6.E-02	4.2E+00		1.0E+00	2.3E-01	U	2.3E-01	8.8E+00		2.3E-01	9.9E+00		4.1E-01
11	J030R3	4/15/05	2.0E+00		1.6E+00	7.21E+01		1.1E-01	4.5E-01		6.E-02	3.7E+00		9.4E-01	2.5E-01		2.2E-01	1.01E+01		2.2E-01	9.9E+00		3.9E-01
12	J030R4	4/15/05	1.20E+01		1.8E+00	1.63E+02		1.2E-01	7.6E-01		6.E-02	5.5E+00		1.0E+00	3.9E-01		2.4E-01	2.07E+01		2.4E-01	1.56E+01		4.3E-01
13	J030R5	4/15/05	3.1E+00		1.6E+00	6.39E+01		1.1E-01	4.9E-01		6.E-02	6.3E+00		9.4E-01	2.9E-01		2.2E-01	8.7E+00		2.2E-01	1.09E+01		3.9E-01
14	J030R6	4/15/05	2.3E+00		1.6E+00	6.50E+01		1.1E-01	3.4E-01		6.E-02	3.3E+00		9.6E-01	4.2E-01		2.3E-01	8.6E+00		2.3E-01	8.9E+00		4.0E-01
15	J030R7	4/15/05	2.7E+00		1.8E+00	8.19E+01		1.3E-01	4.5E-01		6.E-02	1.6E+00	UJ	1.6E+00	3.6E-01		2.5E-01	5.8E+00		2.5E-01	1.09E+01		4.4E-01
Duplicate of J030R7	J030R8	4/15/05	2.8E+00		1.7E+00	8.90E+01		1.2E-01	5.0E-01		6.E-02	1.8E+00		1.0E+00	2.5E-01		2.4E-01	5.5E+00		2.4E-01	1.16E+01		4.2E-01

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Boron mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg
1	J030P3	4/15/05	5.1E+00	8.75E+01	4.9E-01	5.4E+00	4.1E-01	1.55E+01	1.18E+01
2	J030P4	4/15/05	1.5E+00	5.93E+01	3.1E-01	7.5E-01	1.0E-01	4.9E+00	9.1E+00
3	J030P5	4/15/05	3.0E+00	7.09E+01	4.6E-01	2.1E+00	3.3E-01	9.8E+00	1.06E+01
4	J030P6	4/15/05	6.2E+00	1.30E+02	5.8E-01	4.2E+00	3.7E-01	1.56E+01	1.28E+01
5	J030P7	4/15/05	2.7E+00	7.51E+01	4.3E-01	7.8E+00	3.4E-01	1.10E+01	1.00E+01
6	J030P8	4/15/05	4.1E+00	5.49E+01	4.7E-01	4.5E+00	9.0E-02	5.0E+00	1.01E+01
7	J030P9	4/15/05	4.0E+00	5.71E+01	5.1E-01	3.6E+00	1.1E-01	4.1E+00	1.02E+01
8	J030R0	4/15/05	8.1E+00	6.79E+01	5.4E-01	3.8E+00	1.1E-01	5.5E+00	1.10E+01
9	J030R1	4/15/05	4.4E+00	9.09E+01	6.1E-01	5.2E+00	1.2E-01	6.6E+00	1.12E+01
10	J030R2	4/15/05	4.1E+00	7.11E+01	5.6E-01	4.2E+00	1.2E-01	8.8E+00	9.9E+00
11	J030R3	4/15/05	2.0E+00	7.21E+01	4.5E-01	3.7E+00	2.5E-01	1.01E+01	9.9E+00
12	J030R4	4/15/05	1.20E+01	1.63E+02	7.6E-01	5.5E+00	3.9E-01	2.07E+01	1.56E+01
13	J030R5	4/15/05	3.1E+00	6.39E+01	4.9E-01	6.3E+00	2.9E-01	8.7E+00	1.09E+01
14	J030R6	4/15/05	2.3E+00	6.50E+01	3.4E-01	3.3E+00	4.2E-01	8.6E+00	8.9E+00
15	J030R7/J030R8	4/15/05	2.8E+00	8.55E+01	4.8E-01	1.3E+00	3.1E-01	5.7E+00	1.13E+01

Statistical Computations

Statistical value based on	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt
	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), 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	15	15	15	15	15	15	15
% < Detection limit	0%	0%	0%	7%	40%	0%	0%
mean	4.4E+00	8.09E+01	5.0E-01	4.1E+00	2.5E-01	9.4E+00	1.09E+01
standard deviation	2.7E+00	2.93E+01	1.1E-01	1.8E+00	1.3E-01	4.7E+00	1.6E+00
95% UCL on mean	5.9E+00	9.34E+01	5.6E-01	4.9E+00	3.0E-01	1.22E+01	1.16E+01
maximum value	1.20E+01	1.63E+02	7.6E-01	7.8E+00	4.2E-01	2.07E+01	1.56E+01
Statistical value	5.9E+00	9.34E+01	5.6E-01	4.9E+00	3.0E-01	1.22E+01	1.16E+01
Background	NA	NA	NA	NA	NA	NA	NA
Statistical value above background	5.9E+00	9.34E+01	5.6E-01	4.9E+00	3.0E-01	1.22E+01	1.16E+01
Most Stringent Cleanup Limit for nonradionuclide and RAG type	20 BG/GW & River Protection	132 BG/GW Protection	1.51 BG/GW & River Protection	320 GW Protection	0.81 BG/GW & River Protection	18.5 BG/GW & River Protection	32 GW Protection
WAC 173-340 3-PART TEST							
95% UCL > Cleanup Limit?	NA	NO	NA	NO	NA	NO	NA
> 10% above Cleanup Limit?	NA	NO	NA	NO	NA	NO	NA
Any sample > 2X Cleanup Limit?	NA	NO	NA	NO	NA	NO	NA
WAC 173-340 Compliance? **See next page**	Because all values are below background (20 mg/kg), the MTCA 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.	Because all values are below background (1.51 mg/kg), the MTCA 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.	Because all values are below background (0.81 mg/kg), the MTCA 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.	Because all values are below background (15.7 mg/kg), the MTCA 3-part test is not required.

Duplicate Analysis

Results:

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Q	Arsenic PQL	Barium mg/kg	Q	Barium PQL	Beryllium mg/kg	Q	Beryllium PQL	Boron mg/kg	Q	Boron PQL	Cadmium mg/kg	Q	Cadmium PQL	Chromium mg/kg	Q	Chromium PQL	Cobalt mg/kg	Q	Cobalt PQL
15	J030R7	4/15/05	2.7E+00	0	1.8E+00	8.19E+01		1.3E-01	4.5E-01		6.E-02	1.6E+00	UJ	1.6E+00	3.6E-01		2.5E-01	5.8E+00		2.5E-01	1.09E+01	0	4.4E-01
Duplicate of J030R7	J030R8	4/15/05	2.8E+00	###	1.7E+00	8.90E+01		1.2E-01	5.0E-01		6.E-02	1.8E+00		1.0E+00	2.5E-01		2.4E-01	5.5E+00		2.4E-01	1.16E+01	0	4.2E-01

Analysis:

		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt
(TDL)		10	2	0.5	2	0.2	1	2
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	No-Stop (acceptable)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)		No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD		8.3%				5.3%	6.2%

BG = background
GW = groundwater
HEIS = Hanford Environmental Information System
J = estimated
MTCA = *Model Toxic Control Act*
NA = not applicable
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RESRAD = RESidual RADioactivity
RPD = relative percent difference
TDL = target detection limit
U = undetected
WAC = *Washington Administrative Code*

Bechtel Hanford, Inc.

CALCULATION SHEET

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Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations

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Shallow Zone Sample Data

Sampling Area	HEIS Number	Sample Date	Copper mg/kg	Q	Copper PQL	Lead mg/kg	Q	Lead PQL	Manganese mg/kg	Q	Manganese PQL	Nickel mg/kg	Q	Nickel PQL	Vanadium mg/kg	Q	Vanadium PQL	Zinc mg/kg	Q	Zinc PQL
1	J030P3	4/15/05	2.51E+01		3.3E-01	8.3E+00		1.2E+00	5.34E+02		1.3E-01	1.79E+01		6.6E-01	5.92E+01		3.9E-01	6.67E+01		3.3E-01
2	J030P4	4/15/05	1.63E+01		2.5E-01	2.0E+00		9.4E-01	3.40E+02		1.E-01	7.9E+00		5.0E-01	5.94E+01		3.0E-01	4.85E+01		2.5E-01
3	J030P5	4/15/05	2.08E+01		2.8E-01	6.1E+00		1.0E+00	4.39E+02		1.1E-01	1.28E+01		5.5E-01	6.85E+01		3.3E-01	5.81E+01		2.8E-01
4	J030P6	4/15/05	2.63E+01		3.2E-01	9.1E+00		1.2E+00	5.50E+02		1.3E-01	1.92E+01		6.3E-01	6.73E+01		3.8E-01	7.18E+01		3.2E-01
5	J030P7	4/15/05	1.94E+01		2.8E-01	6.5E+00		1.1E+00	4.00E+02		1.1E-01	1.38E+01		5.6E-01	6.45E+01		3.4E-01	5.51E+01		2.8E-01
6	J030P8	4/15/05	1.87E+01		2.3E-01	3.9E+00		8.8E-01	3.46E+02		9.E-02	8.6E+00		4.6E-01	6.43E+01		2.8E-01	5.05E+01		2.3E-01
7	J030P9	4/15/05	1.58E+01		2.7E-01	2.3E+00		1.0E+00	3.50E+02		1.1E-01	8.2E+00		5.4E-01	6.36E+01		3.2E-01	4.75E+01		2.7E-01
8	J030R0	4/15/05	2.27E+01		2.7E-01	4.4E+00		1.0E+00	3.60E+02		1.1E-01	1.54E+01		5.4E-01	6.61E+01		3.2E-01	5.28E+01		2.7E-01
9	J030R1	4/15/05	2.09E+01		2.9E-01	4.5E+00		1.1E+00	4.00E+02		1.2E-01	1.12E+01		5.8E-01	6.82E+01		3.5E-01	5.84E+01		2.9E-01
10	J030R2	4/15/05	1.90E+01		2.9E-01	4.6E+00		1.1E+00	3.74E+02		1.2E-01	1.18E+01		5.9E-01	6.14E+01		3.5E-01	5.05E+01		2.9E-01
11	J030R3	4/15/05	1.94E+01		2.8E-01	5.8E+00		1.0E+00	3.92E+02		1.1E-01	1.26E+01		5.5E-01	6.54E+01		3.3E-01	5.48E+01		2.8E-01
12	J030R4	4/15/05	3.60E+01		3.1E-01	1.81E+01		1.2E+00	6.89E+02		1.2E-01	2.62E+01		6.1E-01	6.24E+01		3.7E-01	8.44E+01		3.1E-01
13	J030R5	4/15/05	2.05E+01		2.8E-01	5.7E+00		1.0E+00	4.34E+02		1.1E-01	1.39E+01		5.5E-01	7.39E+01		3.3E-01	5.90E+01		2.8E-01
14	J030R6	4/15/05	1.70E+01		2.8E-01	5.7E+00		1.1E+00	4.09E+02		1.1E-01	1.21E+01		5.7E-01	5.67E+01		3.4E-01	4.78E+01		2.8E-01
15	J030R7	4/15/05	1.99E+01		3.1E-01	4.6E+00		1.2E+00	3.56E+02		1.3E-01	9.3E+00		6.3E-01	6.48E+01		3.8E-01	5.25E+01		3.1E-01
Duplicate of J030R7	J030R8	4/15/05	2.10E+01		3.0E-01	5.2E+00		1.1E+00	3.85E+02		1.2E-01	1.01E+01		6.0E-01	7.61E+01		3.6E-01	6.93E+01		3.0E-01

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Copper mg/kg			Lead mg/kg			Manganese mg/kg			Nickel mg/kg			Vanadium mg/kg			Zinc mg/kg		
1	J030P3	4/15/05	2.51E+01			8.3E+00			5.34E+02			1.79E+01			5.92E+01			6.67E+01		
2	J030P4	4/15/05	1.63E+01			2.0E+00			3.40E+02			7.9E+00			5.94E+01			4.85E+01		
3	J030P5	4/15/05	2.08E+01			6.1E+00			4.39E+02			1.28E+01			6.85E+01			5.81E+01		
4	J030P6	4/15/05	2.63E+01			9.1E+00			5.50E+02			1.92E+01			6.73E+01			7.18E+01		
5	J030P7	4/15/05	1.94E+01			6.5E+00			4.00E+02			1.38E+01			6.45E+01			5.51E+01		
6	J030P8	4/15/05	1.87E+01			3.9E+00			3.46E+02			8.6E+00			6.43E+01			5.05E+01		
7	J030P9	4/15/05	1.58E+01			2.3E+00			3.50E+02			8.2E+00			6.36E+01			4.75E+01		
8	J030R0	4/15/05	2.27E+01			4.4E+00			3.60E+02			1.54E+01			6.61E+01			5.28E+01		
9	J030R1	4/15/05	2.09E+01			4.5E+00			4.00E+02			1.12E+01			6.82E+01			5.84E+01		
10	J030R2	4/15/05	1.90E+01			4.6E+00			3.74E+02			1.18E+01			6.14E+01			5.05E+01		
11	J030R3	4/15/05	1.94E+01			5.8E+00			3.92E+02			1.26E+01			6.54E+01			5.48E+01		
12	J030R4	4/15/05	3.60E+01			1.81E+01			6.89E+02			2.62E+01			6.24E+01			8.44E+01		
13	J030R5	4/15/05	2.05E+01			5.7E+00			4.34E+02			1.39E+01			7.39E+01			5.90E+01		
14	J030R6	4/15/05	1.70E+01			5.7E+00			4.09E+02			1.21E+01			5.67E+01			4.78E+01		
15	J030R7/J030R8	4/15/05	2.05E+01			4.9E+00			3.71E+02			9.7E+00			7.05E+01			6.09E+01		

Statistical Computations

Statistical value based on	Copper	Lead	Manganese	Nickel	Vanadium	Zinc
	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	15	15	15	15	15	15
% < Detection limit	0%	0%	0%	0%	0%	0%
mean	2.12E+01	6.1E+00	4.26E+02	1.34E+01	6.48E+01	5.78E+01
standard deviation	5.02E+00	3.8E+00	9.60E+01	4.8E+00	4.58E+00	1.01E+01
95% UCL on mean	2.34E+01	8.3E+00	4.67E+02	1.59E+01	6.69E+01	6.24E+01
maximum value	3.60E+01	1.81E+01	6.89E+02	2.62E+01	7.61E+01	8.44E+01
Statistical value	2.34E+01	8.3E+00	4.67E+02	1.59E+01	6.69E+01	6.24E+01
Background	NA	NA	NA	NA	NA	NA
Statistical value above background	2.34E+01	8.3E+00	4.67E+02	1.59E+01	6.69E+01	6.24E+01
Most Stringent Cleanup Limit for nonradionuclide and RAG type	22 BG/River Protection	10.2 BG/GW & River Protection	512 BG/GW Protection	19.1 BG/GW Protection	85.1 BG/GW Protection	67.8 BG/River Protection
WAC 173-340 3-PART TEST						
95% UCL > Cleanup Limit?	YES	NO	NO	NO	NA	NO
> 10% above Cleanup Limit?	YES	NO	YES	YES	NA	YES
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NA	NO
WAC 173-340 Compliance? NO	Because of "yes" answers to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	The data set meets the 3-part test criteria when compared to the most stringent cleanup levels.	Because of "yes" answer to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	Because of "yes" answer to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	Because all values are below background (85.1 mg/kg), the MTCA 3-part test is not required.	Because of "yes" answer to the MTCA 3-part test, a detailed assessment using RESRAD will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.

Duplicate Analysis

Results:

Sampling Area	HEIS Number	Sample Date	Copper mg/kg	Q	Copper PQL	Lead mg/kg	Q	Lead PQL	Manganese mg/kg	Q	Manganese PQL	Nickel mg/kg	Q	Nickel PQL	Vanadium mg/kg	Q	Vanadium PQL	Zinc mg/kg	Q	Zinc PQL
15	J030R7	4/15/05	1.99E+01	0	3.1E-01	4.6E+00		1.2E+00	3.56E+02		1.3E-01	9.3E+00		6.3E-01	6.48E+01		3.8E-01	5.25E+01		3.1E-01
Duplicate of J030R7	J030R8	4/15/05	2.10E+01	###	3.0E-01	5.2E+00		1.1E+00	3.85E+02		1.2E-01	1.01E+01		6.0E-01	7.61E+01		3.6E-01	6.93E+01		3.0E-01

Analysis:

	(TDL)	Copper 1	Lead 5	Manganese 5	Nickel 4	Vanadium 2.5	Zinc 1
Duplicate Analysis	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	No-Stop (acceptable)	Yes (calc RPD)	Yes (calc RPD)
	RPD	5.4%		7.8%		16%	28%

BG = background
GW = groundwater
HEIS = Hanford Environmental Information System
MTCA = *Model Toxic Control Act*
NA = not applicable
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RESRAD = RESidual RADioactivity
RPD = relative percent difference
TDL = target detection limit
WAC = *Washington Administrative Code*

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator J. M. Capron JMC **Date** 08/23/05 **Calc. No.** 0100B-CA-V0260 **Rev. No.** 0

Project 100 B/C Remedial Action Project **Job No.** 22192 **Checked** T. M. Blakley JMB **Date** 8/23/05

Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations **Checked** T. B. Miley TBM **Date** 8-24-05

Sheet No. 5 of 8

Ecology Software (MTCAStat)

Arsenic 95% UCL Calculation

DATA	ID
5.1E+00	J030P3
1.5E+00	J030P4
3.0E+00	J030P5
6.2E+00	J030P6
2.7E+00	J030P7
4.1E+00	J030P8
4.0E+00	J030P9
8.1E+00	J030R0
4.4E+00	J030R1
4.1E+00	J030R2
2.0E+00	J030R3
1.20E+01	J030R4
3.1E+00	J030R5
2.3E+00	J030R6
2.8E+00	J030R7/J030R8

Number of samples
Uncensored 15
Censored
Detection limit or PQL
Method detection limit
TOTAL 15

Uncensored values
Mean 4.4
Lognormal mean 4.4
Std. devn. 2.7
Median 4.0
Min. 1.5
Max. 12.0

Lognormal distribution?
r-squared is: 0.974

Normal distribution?
r-squared is: 0.808

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.9

Barium 95% UCL Calculation

DATA	ID
8.75E+01	J030P3
5.93E+01	J030P4
7.09E+01	J030P5
1.30E+02	J030P6
7.51E+01	J030P7
5.49E+01	J030P8
5.71E+01	J030P9
6.79E+01	J030R0
9.09E+01	J030R1
7.11E+01	J030R2
7.21E+01	J030R3
1.63E+02	J030R4
6.39E+01	J030R5
6.50E+01	J030R6
8.55E+01	J030R7/J030R8

Number of samples
Uncensored 15
Censored
Detection limit or PQL
Method detection limit
TOTAL 15

Uncensored values
Mean 80.9
Lognormal mean 80.8
Std. devn. 29.3
Median 71.1
Min. 54.9
Max. 163

Lognormal distribution?
r-squared is: 0.861

Normal distribution?
r-squared is: 0.746

Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 93.4

Beryllium 95% UCL Calculation

DATA	ID
4.9E-01	J030P3
3.1E-01	J030P4
4.6E-01	J030P5
5.8E-01	J030P6
4.3E-01	J030P7
4.7E-01	J030P8
5.1E-01	J030P9
5.4E-01	J030R0
6.1E-01	J030R1
5.6E-01	J030R2
4.5E-01	J030R3
7.6E-01	J030R4
4.9E-01	J030R5
3.4E-01	J030R6
4.8E-01	J030R7/J030R8

Number of samples
Uncensored 15
Censored
Detection limit or PQL
Method detection limit
TOTAL 15

Uncensored values
Mean 0.50
Lognormal mean 0.50
Std. devn. 0.11
Median 0.49
Min. 0.31
Max. 0.76

Lognormal distribution?
r-squared is: 0.942

Normal distribution?
r-squared is: 0.932

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.56

Boron 95% UCL Calculation

DATA	ID
5.4E+00	J030P3
7.5E-01	J030P4
2.1E+00	J030P5
4.2E+00	J030P6
7.8E+00	J030P7
4.5E+00	J030P8
3.6E+00	J030P9
3.8E+00	J030R0
5.2E+00	J030R1
4.2E+00	J030R2
3.7E+00	J030R3
5.5E+00	J030R4
6.3E+00	J030R5
3.3E+00	J030R6
1.3E+00	J030R7/J030R8

Number of samples
Uncensored 15
Censored
Detection limit or PQL
Method detection limit
TOTAL 15

Uncensored values
Mean 4.1
Lognormal mean 4.3
Std. devn. 1.8
Median 4.2
Min. 0.8
Max. 7.8

Lognormal distribution?
r-squared is: 0.849

Normal distribution?
r-squared is: 0.973

Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 4.9

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator J. M. Capron JMC — Date 08/23/05 — Calc. No. 0100B-CA-V0260 — Rev. No. 0
Project 100 B/C Remedial Action Project — Job No. 22192 — Checked T. M. Blakley JMB — Date 8/23/05
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations — Checked T. B. Miley TBM — Date 8-24-05
Sheet No. 6 of 8

Ecology Software (MTCAStat)

Cadmium 95% UCL Calculation

DATA	ID
4.1E-01	J030P3
1.0E-01	J030P4
3.3E-01	J030P5
3.7E-01	J030P6
3.4E-01	J030P7
9.0E-02	J030P8
1.1E-01	J030P9
1.1E-01	J030R0
1.2E-01	J030R1
1.2E-01	J030R2
2.5E-01	J030R3
3.9E-01	J030R4
2.9E-01	J030R5
4.2E-01	J030R6
3.1E-01	J030R7/J030R8

Number of samples — Uncensored values
Uncensored 15 — Mean 0.25
Censored — Lognormal mean 0.26
Detection limit or PQL — Std. devn. 0.13
Method detection limit — Median 0.29
TOTAL 15 — Min. 0.090
Max. 0.42

Lognormal distribution? — Normal distribution?
r-squared is: 0.839 — r-squared is: 0.874
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 0.30

Chromium 95% UCL Calculation

DATA	ID
1.55E+01	J030P3
4.9E+00	J030P4
9.8E+00	J030P5
1.56E+01	J030P6
1.10E+01	J030P7
5.0E+00	J030P8
4.1E+00	J030P9
5.5E+00	J030R0
6.6E+00	J030R1
8.8E+00	J030R2
1.01E+01	J030R3
2.07E+01	J030R4
8.7E+00	J030R5
8.6E+00	J030R6
5.7E+00	J030R7/J030R8

Number of samples — Uncensored values
Uncensored 15 — Mean 9.4
Censored — Lognormal mean 9.4
Detection limit or PQL — Std. devn. 4.7
Method detection limit — Median 8.7
TOTAL 15 — Min. 4.1
Max. 20.7

Lognormal distribution? — Normal distribution?
r-squared is: 0.966 — r-squared is: 0.885
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 12.2

Cobalt 95% UCL Calculation

DATA	ID
1.18E+01	J030P3
9.1E+00	J030P4
1.06E+01	J030P5
1.28E+01	J030P6
1.00E+01	J030P7
1.01E+01	J030P8
1.02E+01	J030P9
1.10E+01	J030R0
1.12E+01	J030R1
9.9E+00	J030R2
9.9E+00	J030R3
1.56E+01	J030R4
1.09E+01	J030R5
8.9E+00	J030R6
1.13E+01	J030R7/J030R8

Number of samples — Uncensored values
Uncensored 15 — Mean 10.9
Censored — Lognormal mean 10.9
Detection limit or PQL — Std. devn. 1.6
Method detection limit — Median 10.6
TOTAL 15 — Min. 8.9
Max. 15.6

Lognormal distribution? — Normal distribution?
r-squared is: 0.891 — r-squared is: 0.829
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 11.6

Copper 95% UCL Calculation

DATA	ID
2.51E+01	J030P3
1.63E+01	J030P4
2.08E+01	J030P5
2.63E+01	J030P6
1.94E+01	J030P7
1.87E+01	J030P8
1.58E+01	J030P9
2.27E+01	J030R0
2.09E+01	J030R1
1.90E+01	J030R2
1.94E+01	J030R3
3.60E+01	J030R4
2.05E+01	J030R5
1.70E+01	J030R6
2.05E+01	J030R7/J030R8

Number of samples — Uncensored values
Uncensored 15 — Mean 21.2
Censored — Lognormal mean 21.2
Detection limit or PQL — Std. devn. 5.02
Method detection limit — Median 20.5
TOTAL 15 — Min. 15.8
Max. 36.0

Lognormal distribution? — Normal distribution?
r-squared is: 0.887 — r-squared is: 0.793
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 23.4

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CALCULATION SHEET

Originator J. M. Capron JMC — Date 08/23/05 — Calc. No. 0100B-CA-V0260 — Rev. No. 0
Project 100 B/C Remedial Action Project — Job No. 22192 — Checked T. M. Blakley TMB — Date 8/23/05
Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations — Checked T. B. Miley TBM — Date 8-24-05
Sheet No. 7 of 8

Ecology Software (MTCAStat)

Lead 95% UCL Calculation

DATA	ID
8.3E+00	J030P3
2.0E+00	J030P4
6.1E+00	J030P5
9.1E+00	J030P6
6.5E+00	J030P7
3.9E+00	J030P8
2.3E+00	J030P9
4.4E+00	J030R0
4.5E+00	J030R1
4.6E+00	J030R2
5.8E+00	J030R3
1.81E+01	J030R4
5.7E+00	J030R5
5.7E+00	J030R6
4.9E+00	J030R7/J030R8

Number of samples: Uncensored 15; Censored; Detection limit or PQL; Method detection limit; TOTAL 15

Uncensored values: Mean 6.1; Lognormal mean 6.1; Std. devn. 3.8; Median 5.7; Min. 2.0; Max. 18.1

Lognormal distribution? r-squared is: 0.925

Normal distribution? r-squared is: 0.727

Recommendations: Use lognormal distribution.

UCL (Land's method) is 8.3

Manganese 95% UCL Calculation

DATA	ID
5.34E+02	J030P3
3.40E+02	J030P4
4.39E+02	J030P5
5.50E+02	J030P6
4.00E+02	J030P7
3.46E+02	J030P8
3.50E+02	J030P9
3.60E+02	J030R0
4.00E+02	J030R1
3.74E+02	J030R2
3.92E+02	J030R3
6.89E+02	J030R4
4.34E+02	J030R5
4.09E+02	J030R6
3.71E+02	J030R7/J030R8

Number of samples: Uncensored 15; Censored; Detection limit or PQL; Method detection limit; TOTAL 15

Uncensored values: Mean 426; Lognormal mean 426; Std. devn. 96.0; Median 400; Min. 340; Max. 689

Lognormal distribution? r-squared is: 0.853

Normal distribution? r-squared is: 0.785

Recommendations: Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 467

Nickel 95% UCL Calculation

DATA	ID
1.79E+01	J030P3
7.9E+00	J030P4
1.28E+01	J030P5
1.92E+01	J030P6
1.38E+01	J030P7
8.6E+00	J030P8
8.2E+00	J030P9
1.54E+01	J030R0
1.12E+01	J030R1
1.18E+01	J030R2
1.26E+01	J030R3
2.62E+01	J030R4
1.39E+01	J030R5
1.21E+01	J030R6
9.7E+00	J030R7/J030R8

Number of samples: Uncensored 15; Censored; Detection limit or PQL; Method detection limit; TOTAL 15

Uncensored values: Mean 13.4; Lognormal mean 13.4; Std. devn. 4.8; Median 12.6; Min. 7.9; Max. 26.2

Lognormal distribution? r-squared is: 0.964

Normal distribution? r-squared is: 0.881

Recommendations: Use lognormal distribution.

UCL (Land's method) is 15.9

Vanadium 95% UCL Calculation

DATA	ID
5.92E+01	J030P3
5.94E+01	J030P4
6.85E+01	J030P5
6.73E+01	J030P6
6.45E+01	J030P7
6.43E+01	J030P8
6.36E+01	J030P9
6.61E+01	J030R0
6.82E+01	J030R1
6.14E+01	J030R2
6.54E+01	J030R3
6.24E+01	J030R4
7.39E+01	J030R5
5.67E+01	J030R6
7.05E+01	J030R7/J030R8

Number of samples: Uncensored 15; Censored; Detection limit or PQL; Method detection limit; TOTAL 15

Uncensored values: Mean 64.8; Lognormal mean 64.8; Std. devn. 4.58; Median 64.5; Min. 56.7; Max. 73.9

Lognormal distribution? r-squared is: 0.992

Normal distribution? r-squared is: 0.991

Recommendations: Use lognormal distribution.

UCL (Land's method) is 66.9

Bechtel Hanford, Inc.

CALCULATION SHEET

Originator J. M. Capron **Date** 08/23/05 **Calc. No.** 0100B-CA-V0260 **Rev. No.** 0

Project 100 B/C Remedial Action Project **Job No.** 22192 **Checked** T. M. Blakley **Date** 8/23/05

Subject 126-B-3 Coal Pit Dumping Area Cleanup Verification 95% UCL Calculations **Checked** T. B. Miley **Date** 8-24-05

Sheet No. 8 of 8

Ecology Software (MTCAStat)

Zinc 95% UCL Calculation

	DATA	ID
1	6.67E+01	J030P3
2	4.85E+01	J030P4
3	5.81E+01	J030P5
4	7.18E+01	J030P6
5	5.51E+01	J030P7
6	5.05E+01	J030P8
7	4.75E+01	J030P9
8	5.28E+01	J030R0
9	5.84E+01	J030R1
10	5.05E+01	J030R2
11	5.48E+01	J030R3
12	8.44E+01	J030R4
13	5.90E+01	J030R5
14	4.78E+01	J030R6
15	6.09E+01	J030R7/J030R8
16		
17		
18		
19		
20		

Number of samples		Uncensored values	
Uncensored	15	Mean	57.8
Censored		Lognormal mean	57.8
Detection limit or PQL		Std. devn.	10.1
Method detection limit		Median	55.1
TOTAL	15	Min.	47.5
		Max.	84.4

Lognormal distribution?	Normal distribution?
r-squared is: 0.911	r-squared is: 0.860
Recommendations:	
Use lognormal distribution.	

UCL (Land's method) is 62.4

Attachment 1. 126-B-3 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J030P3	04/15/05	1.4	UJ	1.4	5.1		1.9	87.5		0.13	0.49		0.07	5.4		1.1	0.41		0.26
2	J030P4	04/15/05	1.1	UJ	1.1	1.5		1.4	59.3		0.1	0.31		0.05	1.5	UJ	1.5	0.20	U	0.20
3	J030P5	04/15/05	1.2	UJ	1.2	3.0		1.6	70.9		0.11	0.46		0.06	2.1		0.94	0.33		0.22
4	J030P6	04/15/05	1.4	UJ	1.4	6.2		1.8	130		0.13	0.58		0.06	4.2		1.1	0.37		0.25
5	J030P7	04/15/05	1.2	UJ	1.2	2.7		1.6	75.1		0.11	0.43		0.06	7.8		0.95	0.34		0.22
6	J030P8	04/15/05	1.0	UJ	1.0	4.1		1.3	54.9		0.09	0.47		0.05	4.5		0.78	0.18	U	0.18
7	J030P9	04/15/05	1.2	UJ	1.2	4.0		1.6	57.1		0.11	0.51		0.05	3.6		0.91	0.21	U	0.21
8	J030R0	04/15/05	1.2	UJ	1.2	8.1		1.6	67.9		0.11	0.54		0.05	3.8		0.92	0.22	U	0.22
9	J030R1	04/15/05	1.3	UJ	1.3	4.4		1.7	90.9		0.12	0.61		0.06	5.2		0.98	0.23	U	0.23
10	J030R2	04/15/05	1.3	UJ	1.3	4.1		1.7	71.1		0.12	0.56		0.06	4.2		1.0	0.23	U	0.23
11	J030R3	04/15/05	1.2	UJ	1.2	2.0		1.6	72.1		0.11	0.45		0.06	3.7		0.94	0.25		0.22
12	J030R4	04/15/05	1.3	UJ	1.3	12.0		1.8	163		0.12	0.76		0.06	5.5		1.0	0.39		0.24
13	J030R5	04/15/05	1.2	UJ	1.2	3.1		1.6	63.9		0.11	0.49		0.06	6.3		0.94	0.29		0.22
14	J030R6	04/15/05	1.2	UJ	1.3	2.3		1.6	65.0		0.11	0.34		0.06	3.3		0.96	0.42		0.23
15	J030R7	04/15/05	1.4	UJ	1.4	2.7		1.8	81.9		0.13	0.45		0.06	1.6	UJ	1.6	0.36		0.25
Duplicate of J030R7	J030R8	04/15/05	1.3	UJ	1.3	2.8		1.7	89.0		0.12	0.50		0.06	1.8		1.0	0.25		0.24
Equipment Blank	J030R9	04/15/05	0.19	UJ	0.19	0.25	U	0.25	1.7		0.02	0.04	UJ	0.04	0.15	U	0.15	0.03	U	0.03

Note: Data qualified with B, C, and/or J, are considered acceptable values.
B = blank contamination
BHC = hexachlorocyclohexane
D = diluted
HEIS = Hanford Environmental Information System
J = estimate
PCB = polychlorinated biphenyl
PQL = practical quantitation limit
Q = qualifier
SVOA = semivolatile organic analyte
U = undetected

Attachment	1	Sheet No.	1 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	8/23/05
Checked	T. M. Blakley	Date	8-24-05
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Chromium			Cobalt			Copper			Lead			Manganese			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J030P3	04/15/05	15.5		0.26	11.8		0.46	25.1		0.33	8.3		1.2	534		0.13	0.02	U	0.02
2	J030P4	04/15/05	4.9		0.20	9.1		0.35	16.3		0.25	2.0		0.94	340		0.1	0.03		0.01
3	J030P5	04/15/05	9.8		0.22	10.6		0.39	20.8		0.28	6.1		1.0	439		0.11	0.02	U	0.02
4	J030P6	04/15/05	15.6		0.25	12.8		0.44	26.3		0.32	9.1		1.2	550		0.13	0.02	U	0.02
5	J030P7	04/15/05	11.0		0.22	10.0		0.39	19.4		0.28	6.5		1.1	400		0.11	0.02	U	0.02
6	J030P8	04/15/05	5.0		0.18	10.1		0.32	18.7		0.23	3.9		0.88	346		0.09	0.01	U	0.01
7	J030P9	04/15/05	4.1		0.21	10.2		0.38	15.8		0.27	2.3		1.0	350		0.11	0.02	U	0.02
8	J030R0	04/15/05	5.5		0.22	11.0		0.38	22.7		0.27	4.4		1.0	360		0.11	0.02	U	0.02
9	J030R1	04/15/05	6.6		0.23	11.2		0.40	20.9		0.29	4.5		1.1	400		0.12	0.02	U	0.02
10	J030R2	04/15/05	8.8		0.23	9.9		0.41	19.0		0.29	4.6		1.1	374		0.12	0.02	U	0.02
11	J030R3	04/15/05	10.1		0.22	9.9		0.39	19.4		0.28	5.8		1.0	392		0.11	0.02	U	0.02
12	J030R4	04/15/05	20.7		0.24	15.6		0.43	36.0		0.31	18.1		1.2	689		0.12	0.03		0.02
13	J030R5	04/15/05	8.7		0.22	10.9		0.39	20.5		0.28	5.7		1.0	434		0.11	0.02	U	0.02
14	J030R6	04/15/05	8.6		0.23	8.9		0.40	17.0		0.28	5.7		1.1	409		0.11	0.01	U	0.01
15	J030R7	04/15/05	5.8		0.25	10.9		0.44	19.9		0.31	4.6		1.2	356		0.13	0.02	U	0.02
Duplicate of J030R7	J030R8	04/15/05	5.5		0.24	11.6		0.42	21.0		0.30	5.2		1.1	385		0.12	0.01	U	0.01
Equipment Blank	J030R9	04/15/05	0.11		0.03	0.13		0.06	0.24		0.04	0.51		0.17	12.9		0.02	0.01	U	0.01

Attachment	1	Sheet No.	2 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Molybdenum			Nickel			Selenium			Silver			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J030P3	04/15/05	1.1	U	1.1	17.9		0.66	2.6	U	2.6	0.33	U	0.33	59.2		0.39	66.7		0.33
2	J030P4	04/15/05	1.4		0.84	7.9		0.50	2.0	U	2.0	0.25	U	0.25	59.4		0.30	48.5		0.25
3	J030P5	04/15/05	0.94	U	0.94	12.8		0.55	2.2	U	2.2	0.28	U	0.28	68.5		0.33	58.1		0.28
4	J030P6	04/15/05	1.1	U	1.1	19.2		0.63	2.5	U	2.5	0.32	U	0.32	67.3		0.38	71.8		0.32
5	J030P7	04/15/05	0.95	U	0.95	13.8		0.56	2.2	U	2.2	0.28	U	0.28	64.5		0.34	55.1		0.28
6	J030P8	04/15/05	0.83		0.78	8.6		0.46	1.8	U	1.8	0.23	U	0.23	64.3		0.28	50.5		0.23
7	J030P9	04/15/05	0.91	U	0.91	8.2		0.54	2.1	U	2.1	0.27	U	0.27	63.6		0.32	47.5		0.27
8	J030R0	04/15/05	0.92	U	0.92	15.4		0.54	2.2	U	2.2	0.27	U	0.27	66.1		0.32	52.8		0.27
9	J030R1	04/15/05	0.98	U	0.98	11.2		0.58	2.3	U	2.3	0.29	U	0.29	68.2		0.35	58.4		0.29
10	J030R2	04/15/05	1.0	U	1.0	11.8		0.59	2.3	U	2.3	0.29	U	0.29	61.4		0.35	50.5		0.29
11	J030R3	04/15/05	0.94	U	0.94	12.6		0.55	2.2	U	2.2	0.28	U	0.28	65.4		0.33	54.8		0.28
12	J030R4	04/15/05	1.2		1.0	26.2		0.61	2.4	U	2.4	0.31	U	0.31	62.4		0.37	84.4		0.31
13	J030R5	04/15/05	1.1		0.94	13.9		0.55	2.2	U	2.2	0.28	U	0.28	73.9		0.33	59.0		0.28
14	J030R6	04/15/05	0.96	U	0.96	12.1		0.57	2.3	U	2.3	0.28	U	0.28	56.7		0.34	47.8		0.28
15	J030R7	04/15/05	1.1	U	1.1	9.3		0.63	2.5	U	2.5	0.31	U	0.31	64.8		0.38	52.5		0.31
Duplicate of J030R7	J030R8	04/15/05	1.0	U	1.0	10.1		0.60	2.4	U	2.4	0.30	U	0.30	76.1		0.36	69.3		0.30
Equipment Blank	J030R9	04/15/05	0.15	U	0.15	0.11		0.09	0.35	U	0.35	0.04	U	0.04	0.30		0.05	2.6		0.04

Sample Location	HEIS Number	Sample Date	Total Petroleum Hydrocarbon			HEIS Number	Asbestos
			mg/kg	Q	PQL		
1	J030P3	04/15/05	150	U	150	J030T0	None Detected
2	J030P4	04/15/05	137	U	137	J030T1	None Detected
3	J030P5	04/15/05	141	U	141	J030T2	None Detected
4	J030P6	04/15/05	144	U	144	J030T3	None Detected
5	J030P7	04/15/05	140	U	140	J030T4	None Detected
6	J030P8	04/15/05	137	U	137	J030T5	None Detected
7	J030P9	04/15/05	138	U	138	J030T6	None Detected
8	J030R0	04/15/05	137	U	137	J030T7	None Detected
9	J030R1	04/15/05	136	U	136	J030T8	None Detected
10	J030R2	04/15/05	139	U	139	J030T9	None Detected
11	J030R3	04/15/05	139	U	139	J030V0	None Detected
12	J030R4	04/15/05	142	U	142	J030V1	None Detected
13	J030R5	04/15/05	137	U	137	J030V2	None Detected
14	J030R6	04/15/05	138	U	138	J030V3	None Detected
15	J030R7	04/15/05	138	U	138	J030V4	None Detected
Duplicate of J030R7	J030R8	04/15/05	139	U	139	J030V5	None Detected
Equipment Blank	J030R9	04/15/05	133	U	133	Not Applicable	Not Applicable

Attachment	1	Sheet No.	3 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P3 Location 1 Sample Date 04/15/05			J030P4 Location 2 Sample Date 04/15/05			J030P5 Location 3 Sample Date 04/15/05			J030P6 Location 4 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls (PCBs)												
Aroclor-1016	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1221	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1232	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1242	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1248	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1254	15	U	15	14	U	14	14	U	14	14	U	14
Aroclor-1260	15	U	15	14	U	14	14	U	14	17		14
Pesticides												
Aldrin	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Alpha-BHC	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
alpha-Chlordane	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Hexachlorocyclohexane	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Delta-BHC	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Dichlorodiphenyldichloroethane	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyldichloroethylene	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyltrichloroethane	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Dieldrin	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Endosulfan I	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Endosulfan II	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endosulfan sulfate	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endrin	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endrin aldehyde	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Endrin ketone	3.8	U	3.8	3.4	U	3.4	3.5	U	3.5	3.6	U	3.6
Gamma-BHC (Lindane)	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
gamma-Chlordane	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Heptachlor	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Heptachlor epoxide	1.9	U	1.9	1.7	U	1.7	1.8	U	1.8	1.8	U	1.8
Methoxychlor	19	U	19	17	U	17	18	U	18	18	U	18
Toxaphene	190	UJ	190	170	UJ	170	180	UJ	180	180	UJ	180
Semivolatile Organics (SVOAs)												
1,2,4-Trichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
1,2-Dichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
1,3-Dichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
1,4-Dichlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
2,4,5-Trichlorophenol	940	UJ	940	860	UJ	860	880	UJ	880	900	UJ	900
2,4,6-Trichlorophenol	380	UJ	380	340	UJ	340	350	UJ	350	360	UJ	360
2,4-Dichlorophenol	380	U	380	340	U	340	350	U	350	360	U	360
2,4-Dimethylphenol	380	U	380	340	U	340	350	U	350	360	U	360
2,4-Dinitrophenol	940	U	940	860	U	860	880	U	880	900	U	900
2,4-Dinitrotoluene	380	U	380	340	U	340	350	U	350	360	U	360
2,6-Dinitrotoluene	380	U	380	340	U	340	350	U	350	360	U	360
2-Chloronaphthalene	380	U	380	340	U	340	350	U	350	360	U	360
2-Chlorophenol	380	U	380	340	U	340	350	U	350	360	U	360
2-Methylnaphthalene	390		380	340	U	340	350	U	350	360	U	360
2-Methylphenol (cresol, o-)	380	U	380	340	U	340	350	U	350	360	U	360

Attachment	1	Sheet No.	4 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P3 Location 1 Sample Date 04/15/05			J030P4 Location 2 Sample Date 04/15/05			J030P5 Location 3 Sample Date 04/15/05			J030P6 Location 4 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
2-Nitroaniline	940	U	940	860	U	860	880	U	880	900	U	900
2-Nitrophenol	380	U	380	340	U	340	350	U	350	360	U	360
3+4 Methylphenol (cresol, m+p)	380	U	380	340	U	340	350	U	350	360	U	360
3,3'-Dichlorobenzidine	380	U	380	340	U	340	350	U	350	360	U	360
3-Nitroaniline	940	U	940	860	U	860	880	U	880	900	U	900
4,6-Dinitro-2-methylphenol	940	U	940	860	U	860	880	U	880	900	U	900
4-Bromophenylphenyl ether	380	U	380	340	U	340	350	U	350	360	U	360
4-Chloro-3-methylphenol	380	U	380	340	U	340	350	U	350	360	U	360
4-Chloroaniline	380	U	380	340	U	340	350	U	350	360	U	360
4-Chlorophenylphenyl ether	380	U	380	340	U	340	350	U	350	360	U	360
4-Nitroaniline	940	U	940	860	U	860	880	U	880	900	U	900
4-Nitrophenol	940	U	940	860	U	860	880	U	880	900	U	900
Acenaphthene	380	U	380	340	U	340	350	U	350	360	U	360
Acenaphthylene	380	U	380	340	U	340	350	U	350	360	U	360
Anthracene	36	J	380	340	U	340	350	U	350	360	U	360
Benzo(a)anthracene	53	J	380	340	U	340	350	U	350	360	U	360
Benzo(a)pyrene	28	J	380	340	U	340	350	U	350	360	U	360
Benzo(b)fluoranthene	34	J	380	340	U	340	350	U	350	360	U	360
Benzo(ghi)perylene	26	J	380	340	U	340	350	U	350	360	U	360
Benzo(k)fluoranthene	21	J	380	340	U	340	350	U	350	360	U	360
Bis(2-chloro-1-methylethyl)ether	380	U	380	340	U	340	350	U	350	360	U	360
Bis(2-Chloroethoxy)methane	380	U	380	340	U	340	350	U	350	360	U	360
Bis(2-chloroethyl) ether	380	U	380	340	U	340	350	U	350	360	U	360
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	380	U	380	340	U	340	350	U	350	360	U	360
Carbazole	380	U	380	340	U	340	350	U	350	360	U	360
Chrysene	84	J	380	340	U	340	350	U	350	360	U	360
Di-n-butylphthalate	660	U	660	340	UB	340	350	UB	350	660	U	660
Di-n-octylphthalate	380	U	380	340	U	340	350	U	350	360	U	360
Dibenz[a,h]anthracene	380	U	380	340	U	340	350	U	350	360	U	360
Dibenzofuran	99	J	380	340	U	340	350	U	350	360	U	360
Diethylphthalate	380	U	380	340	U	340	350	U	350	360	U	360
Dimethyl phthalate	380	U	380	340	U	340	350	U	350	360	U	360
Fluoranthene	120	J	380	340	U	340	350	U	350	360	U	360
Fluorene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachlorobenzene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachlorobutadiene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachlorocyclopentadiene	380	U	380	340	U	340	350	U	350	360	U	360
Hexachloroethane	380	U	380	340	U	340	350	U	350	360	U	360
Indeno(1,2,3-cd)pyrene	24	J	380	340	U	340	350	U	350	360	U	360
Isophorone	380	U	380	340	U	340	350	U	350	360	U	360

Attachment	1	Sheet No.	5 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P3 Location 1 Sample Date 04/15/05			J030P4 Location 2 Sample Date 04/15/05			J030P5 Location 3 Sample Date 04/15/05			J030P6 Location 4 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
N-Nitroso-di-n-dipropylamine	380	U	380	340	U	340	350	U	350	360	U	360
N-Nitrosodiphenylamine	100	J	380	340	U	340	350	U	350	360	U	360
Naphthalene	120	J	380	340	U	340	350	U	350	360	U	360
Nitrobenzene	380	U	380	340	U	340	350	U	350	360	U	360
Pentachlorophenol	940	UJ	940	860	UJ	860	880	UJ	880	900	UJ	900
Phenanthrene	200	J	380	340	U	340	350	U	350	360	U	360
Phenol	380	U	380	340	U	340	350	U	350	360	U	360
Pyrene	86	J	380	340	U	340	350	U	350	360	U	360

Constituent	J030P7 Location 5 Sample Date 04/15/05			J030P8 Location 6 Sample Date 04/15/05			J030P9 Location 7 Sample Date 04/15/05			J030R0 Location 8 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls (PCBs)												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides												
Aldrin	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-BHC	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
alpha-Chlordane	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Delta-BHC	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Dichlorodiphenyldichloroethane	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Dichlorodiphenyldichloroethylene	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Dichlorodiphenyltrichloroethane	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Dieldrin	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan I	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan II	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endosulfan sulfate	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endrin	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endrin aldehyde	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Endrin ketone	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5	3.4	U	3.4
Gamma-BHC (Lindane)	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
gamma-Chlordane	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor epoxide	1.8	U	1.8	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Methoxychlor	18	U	18	17	U	17	17	U	17	17	U	17
Toxaphene	180	UJ	180	170	UJ	170	170	UJ	170	170	UJ	170

Attachment	1	Sheet No.	6 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P7 Location 5 Sample Date 04/15/05			J030P8 Location 6 Sample Date 04/15/05			J030P9 Location 7 Sample Date 04/15/05			J030R0 Location 8 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs												
1,2,4-Trichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
1,2-Dichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
1,3-Dichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
1,4-Dichlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
2,4,5-Trichlorophenol	880	UJ	880	860	UJ	860	860	UJ	860	860	UJ	860
2,4,6-Trichlorophenol	350	UJ	350	350	UJ	350	350	UJ	350	340	UJ	340
2,4-Dichlorophenol	350	U	350	350	U	350	350	U	350	340	U	340
2,4-Dimethylphenol	350	U	350	350	U	350	350	U	350	340	U	340
2,4-Dinitrophenol	880	U	880	860	U	860	860	U	860	860	U	860
2,4-Dinitrotoluene	350	U	350	350	U	350	350	U	350	340	U	340
2,6-Dinitrotoluene	350	U	350	350	U	350	350	U	350	340	U	340
2-Chloronaphthalene	350	U	350	350	U	350	350	U	350	340	U	340
2-Chlorophenol	350	U	350	350	U	350	350	U	350	340	U	340
2-Methylnaphthalene	350	U	350	350	U	350	350	U	350	340	U	340
2-Methylphenol (cresol, o-)	350	U	350	350	U	350	350	U	350	340	U	340
2-Nitroaniline	880	U	880	860	U	860	860	U	860	860	U	860
2-Nitrophenol	350	U	350	350	U	350	350	U	350	340	U	340
3+4 Methylphenol (cresol, m+p)	350	U	350	350	U	350	350	U	350	340	U	340
3,3'-Dichlorobenzidine	350	U	350	350	U	350	350	U	350	340	U	340
3-Nitroaniline	880	U	880	860	U	860	860	U	860	860	U	860
4,6-Dinitro-2-methylphenol	880	U	880	860	U	860	860	U	860	860	U	860
4-Bromophenylphenyl ether	350	U	350	350	U	350	350	U	350	340	U	340
4-Chloro-3-methylphenol	350	U	350	350	U	350	350	U	350	340	U	340
4-Chloroaniline	350	U	350	350	U	350	350	U	350	340	U	340
4-Chlorophenylphenyl ether	350	U	350	350	U	350	350	U	350	340	U	340
4-Nitroaniline	880	U	880	860	U	860	860	U	860	860	U	860
4-Nitrophenol	880	U	880	860	U	860	860	U	860	860	U	860
Acenaphthene	350	U	350	350	U	350	350	U	350	340	U	340
Acenaphthylene	350	U	350	350	U	350	350	U	350	340	U	340
Anthracene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(a)anthracene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(a)pyrene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(b)fluoranthene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(ghi)perylene	350	U	350	350	U	350	350	U	350	340	U	340
Benzo(k)fluoranthene	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-chloro-1-methylethyl)ether	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-Chloroethoxy)methane	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-chloroethyl) ether	350	U	350	350	U	350	350	U	350	340	U	340
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	350	U	350	350	U	350	350	U	350	340	U	340
Carbazole	350	U	350	350	U	350	350	U	350	340	U	340
Chrysene	350	U	350	350	U	350	350	U	350	340	U	340
Di-n-butylphthalate	660	U	660	660	U	660	350	UB	350	340	UB	340
Di-n-octylphthalate	350	U	350	350	U	350	350	U	350	340	U	340
Dibenz[a,h]anthracene	350	U	350	350	U	350	350	U	350	340	U	340
Dibenzofuran	350	U	350	350	U	350	350	U	350	340	U	340
Diethylphthalate	350	U	350	350	U	350	350	U	350	340	U	340
Dimethyl phthalate	350	U	350	350	U	350	350	U	350	340	U	340

Attachment	1	Sheet No.	7 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030P7 Location 5 Sample Date 04/15/05			J030P8 Location 6 Sample Date 04/15/05			J030P9 Location 7 Sample Date 04/15/05			J030R0 Location 8 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Fluoranthene	350	U	350	350	U	350	350	U	350	340	U	340
Fluorene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachlorobenzene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachlorobutadiene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachlorocyclopentadiene	350	U	350	350	U	350	350	U	350	340	U	340
Hexachloroethane	350	U	350	350	U	350	350	U	350	340	U	340
Indeno(1,2,3-cd)pyrene	350	U	350	350	U	350	350	U	350	340	U	340
Isophorone	350	U	350	350	U	350	350	U	350	340	U	340
N-Nitroso-di-n-dipropylamine	350	U	350	350	U	350	350	U	350	340	U	340
N-Nitrosodiphenylamine	350	U	350	350	U	350	350	U	350	340	U	340
Naphthalene	350	U	350	350	U	350	350	U	350	340	U	340
Nitrobenzene	350	U	350	350	U	350	350	U	350	340	U	340
Pentachlorophenol	880	UJ	880	860	UJ	860	860	UJ	860	860	UJ	860
Phenanthrene	19	J	350	350	U	350	350	U	350	340	U	340
Phenol	350	U	350	350	U	350	350	U	350	340	U	340
Pyrene	350	U	350	350	U	350	350	U	350	340	U	340

Constituent	J030R1 Location 9 Sample Date 04/15/05			J030R2 Location 10 Sample Date 04/15/05			J030R3 Location 11 Sample Date 04/15/05			J030R4 Location 12 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides												
Aldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Alpha-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
alpha-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Delta-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Dichlorodiphenyldichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyldichloroethylene	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyltrichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Dieldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Endosulfan I	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Endosulfan II	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endosulfan sulfate	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endrin	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endrin aldehyde	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Endrin ketone	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.6	U	3.6
Gamma-BHC (Lindane)	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8

Attachment	1	Sheet No.	8 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R1 Location 9 Sample Date 04/15/05			J030R2 Location 10 Sample Date 04/15/05			J030R3 Location 11 Sample Date 04/15/05			J030R4 Location 12 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Pesticides (continued)												
gamma-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Heptachlor	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Heptachlor epoxide	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.8	U	1.8
Methoxychlor	17	U	17	17	U	17	17	U	17	18	U	18
Toxaphene	170	UJ	170	170	UJ	170	170	UJ	170	180	UJ	180
SVOAs												
1,2,4-Trichlorobenzene	340	U	340	350	U	350	350	U	350	52	J	360
1,2-Dichlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
1,3-Dichlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
1,4-Dichlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
2,4,5-Trichlorophenol	860	UJ	860	870	UJ	870	870	UJ	870	890	UJ	890
2,4,6-Trichlorophenol	340	UJ	340	350	UJ	350	350	UJ	350	360	UJ	360
2,4-Dichlorophenol	340	U	340	350	U	350	350	U	350	360	U	360
2,4-Dimethylphenol	340	U	340	350	U	350	350	U	350	360	U	360
2,4-Dinitrophenol	860	U	860	870	U	870	870	U	870	890	U	890
2,4-Dinitrotoluene	340	U	340	350	U	350	350	U	350	360	U	360
2,6-Dinitrotoluene	340	U	340	350	U	350	350	U	350	360	U	360
2-Chloronaphthalene	340	U	340	350	U	350	350	U	350	390	U	390
2-Chlorophenol	340	U	340	350	U	350	350	U	350	360	U	360
2-Methylnaphthalene	25	J	340	350	U	350	350	U	350	77	J	360
2-Methylphenol (cresol, o-)	340	U	340	350	U	350	350	U	350	360	U	360
2-Nitroaniline	860	U	860	870	U	870	870	U	870	890	U	890
2-Nitrophenol	340	U	340	350	U	350	350	U	350	360	U	360
3+4 Methylphenol (cresol, m+p)	340	U	340	350	U	350	350	U	350	360	U	360
3,3'-Dichlorobenzidine	340	U	340	350	U	350	350	U	350	360	U	360
3-Nitroaniline	860	U	860	870	U	870	870	U	870	890	U	890
4,6-Dinitro-2-methylphenol	860	U	860	870	U	870	870	U	870	890	U	890
4-Bromophenylphenyl ether	340	U	340	350	U	350	350	U	350	360	U	360
4-Chloro-3-methylphenol	340	U	340	350	U	350	350	U	350	360	U	360
4-Chloroaniline	340	U	340	350	U	350	350	U	350	360	U	360
4-Chlorophenylphenyl ether	340	U	340	350	U	350	350	U	350	360	U	360
4-Nitroaniline	860	U	860	870	U	870	870	U	870	890	U	890
4-Nitrophenol	860	U	860	870	U	870	870	U	870	890	U	890
Acenaphthene	340	U	340	350	U	350	350	U	350	55	J	360
Acenaphthylene	340	U	340	350	U	350	350	U	350	360	U	360
Anthracene	340	U	340	350	U	350	350	U	350	150	J	360
Benzo(a)anthracene	340	U	340	350	U	350	350	U	350	350	J	360
Benzo(a)pyrene	340	U	340	350	U	350	350	U	350	270	J	360
Benzo(b)fluoranthene	340	U	340	350	U	350	350	U	350	190	J	360
Benzo(ghi)perylene	340	U	340	350	U	350	350	U	350	170	J	360
Benzo(k)fluoranthene	340	U	340	350	U	350	350	U	350	240	J	360
Bis(2-chloro-1-methylethyl)ether	340	U	340	350	U	350	350	U	350	360	U	360
Bis(2-Chloroethoxy)methane	340	U	340	350	U	350	350	U	350	360	U	360
Bis(2-chloroethyl) ether	340	U	340	350	U	350	350	U	350	360	U	360
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	340	U	340	350	U	350	350	U	350	360	U	360
Carbazole	340	U	340	350	U	350	350	U	350	75	J	360
Chrysene	340	U	340	350	U	350	350	U	350	370		360

Attachment	1	Sheet No.	9 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R1 Location 9 Sample Date 04/15/05			J030R2 Location 10 Sample Date 04/15/05			J030R3 Location 11 Sample Date 04/15/05			J030R4 Location 12 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Di-n-butylphthalate	660	U	660	350	UB	350	350	UB	350	660	U	660
Di-n-octylphthalate	340	U	340	350	U	350	350	U	350	360	U	360
Dibenz[a,h]anthracene	340	U	340	350	U	350	350	U	350	88	J	360
Dibenzofuran	340	U	340	350	U	350	350	U	350	43	J	360
Diethylphthalate	340	U	340	350	U	350	350	U	350	360	U	360
Dimethyl phthalate	340	U	340	350	U	350	350	U	350	360	U	360
Fluoranthene	340	U	340	350	U	350	350	U	350	730		360
Fluorene	340	U	340	350	U	350	350	U	350	71	J	360
Hexachlorobenzene	340	U	340	350	U	350	350	U	350	360	U	360
Hexachlorobutadiene	340	U	340	350	U	350	350	U	350	360	U	360
Hexachlorocyclopentadiene	340	U	340	350	U	350	350	U	350	360	U	360
Hexachloroethane	340	U	340	350	U	350	350	U	350	360	U	360
Indeno(1,2,3-cd)pyrene	340	U	340	350	U	350	350	U	350	160	J	360
Isophorone	340	U	340	350	U	350	350	U	350	360	U	360
N-Nitroso-di-n-dipropylamine	340	U	340	350	U	350	350	U	350	360	U	360
N-Nitrosodiphenylamine	340	U	340	350	U	350	350	U	350	20	J	360
Naphthalene	340	U	340	350	U	350	350	U	350	60	J	360
Nitrobenzene	340	U	340	350	U	350	350	U	350	360	U	360
Pentachlorophenol	860	UJ	860	870	UJ	870	870	UJ	870	890	UJ	890
Phenanthrene	340	U	340	350	U	350	350	U	350	620		360
Phenol	340	U	340	350	U	350	350	U	350	360	U	360
Pyrene	340	U	340	350	U	350	350	U	350	700		360

Constituent	J030R5 Location 13 Sample Date 04/15/05			J030R6 Location 14 Sample Date 04/15/05			J030R7 Location 15 Sample Date 04/15/05			J030R8 Duplicate of J030R7 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides												
Aldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
alpha-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Delta-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Dichlorodiphenyldichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Dichlorodiphenyldichloroethylene	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Dichlorodiphenyltrichloroethane	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Dieldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan I	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7

Attachment	1	Sheet No.	10 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R5 Location 13 Sample Date 04/15/05			J030R6 Location 14 Sample Date 04/15/05			J030R7 Location 15 Sample Date 04/15/05			J030R8 Duplicate of J030R7 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Pesticides (continued)												
Endosulfan II	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endosulfan sulfate	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endrin	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endrin aldehyde	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Endrin ketone	3.4	U	3.4	3.5	U	3.5	3.5	U	3.5	3.5	U	3.5
Gamma-BHC (Lindane)	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
gamma-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor epoxide	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Methoxychlor	17	U	17	17	U	17	17	U	17	17	U	17
Toxaphene	170	UJ	170	170	UJ	170	170	UJ	170	170	UJ	170
SVOAs												
1,2,4-Trichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
1,2-Dichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
1,3-Dichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
1,4-Dichlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
2,4,5-Trichlorophenol	860	UJ	860	860	UJ	860	870	UJ	870	870	UJ	870
2,4,6-Trichlorophenol	340	UJ	340	350	UJ	350	350	UJ	350	350	UJ	350
2,4-Dichlorophenol	340	U	340	350	U	350	350	U	350	350	U	350
2,4-Dimethylphenol	340	U	340	350	U	350	350	U	350	350	U	350
2,4-Dinitrophenol	860	U	860	860	U	860	870	U	870	870	U	870
2,4-Dinitrotoluene	340	U	340	350	U	350	350	U	350	350	U	350
2,6-Dinitrotoluene	340	U	340	350	U	350	350	U	350	350	U	350
2-Chloronaphthalene	340	U	340	350	U	350	350	U	350	350	U	350
2-Chlorophenol	340	U	340	350	U	350	350	U	350	350	U	350
2-Methylnaphthalene	34	J	340	69	J	350	350	U	350	350	U	350
2-Methylphenol (cresol, o-)	340	U	340	350	U	350	350	U	350	350	U	350
2-Nitroaniline	860	U	860	860	U	860	870	U	870	870	U	870
2-Nitrophenol	340	U	340	350	U	350	350	U	350	350	U	350
3+4 Methylphenol (cresol, m+p)	340	U	340	350	U	350	350	U	350	350	U	350
3,3'-Dichlorobenzidine	340	U	340	350	U	350	350	U	350	350	U	350
3-Nitroaniline	860	U	860	860	U	860	870	U	870	870	U	870
4,6-Dinitro-2-methylphenol	860	U	860	860	U	860	870	U	870	870	U	870
4-Bromophenylphenyl ether	340	U	340	350	U	350	350	U	350	350	U	350
4-Chloro-3-methylphenol	340	U	340	350	U	350	350	U	350	350	U	350
4-Chloroaniline	340	U	340	350	U	350	350	U	350	350	U	350
4-Chlorophenylphenyl ether	340	U	340	350	U	350	350	U	350	350	U	350
4-Nitroaniline	860	U	860	860	U	860	870	U	870	870	U	870
4-Nitrophenol	860	U	860	860	U	860	870	U	870	870	U	870
Acenaphthene	340	U	340	350	U	350	350	U	350	350	U	350
Acenaphthylene	340	U	340	350	U	350	350	U	350	350	U	350
Anthracene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(a)anthracene	340	U	340	17	J	350	350	U	350	350	U	350
Benzo(a)pyrene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(b)fluoranthene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(ghi)perylene	340	U	340	350	U	350	350	U	350	350	U	350
Benzo(k)fluoranthene	340	U	340	350	U	350	350	U	350	350	U	350
Bis(2-chloro-1-methylethyl)ether	340	U	340	350	U	350	350	U	350	350	U	350

Attachment	1	Sheet No.	11 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R5 Location 13 Sample Date 04/15/05			J030R6 Location 14 Sample Date 04/15/05			J030R7 Location 15 Sample Date 04/15/05			J030R8 Duplicate of J030R7 Sample Date 04/15/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Bis(2-Chloroethoxy)methane	340	U	340	350	U	350	350	U	350	350	U	350
Bis(2-chloroethyl) ether	340	U	340	350	U	350	350	U	350	350	U	350
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	340	U	340	350	U	350	350	U	350	350	U	350
Carbazole	340	U	340	350	U	350	350	U	350	350	U	350
Chrysene	18	J	340	24	J	350	350	U	350	350	U	350
Di-n-butylphthalate	340	UB	340	350	UB	350	350	UB	350	350	UB	350
Di-n-octylphthalate	340	U	340	350	U	350	350	U	350	350	U	350
Dibenz[a,h]anthracene	340	U	340	350	U	350	350	U	350	350	U	350
Dibenzofuran	340	U	340	350	U	350	350	U	350	350	U	350
Diethylphthalate	340	U	340	350	U	350	350	U	350	350	U	350
Dimethyl phthalate	340	U	340	350	U	350	350	U	350	350	U	350
Fluoranthene	20	J	340	31	J	350	350	U	350	350	U	350
Fluorene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachlorobenzene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachlorobutadiene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachlorocyclopentadiene	340	U	340	350	U	350	350	U	350	350	U	350
Hexachloroethane	340	U	340	350	U	350	350	U	350	350	U	350
Indeno(1,2,3-cd)pyrene	340	U	340	350	U	350	350	U	350	350	U	350
Isophorone	340	U	340	350	U	350	350	U	350	350	U	350
N-Nitroso-di-n-dipropylamine	340	U	340	350	U	350	350	U	350	350	U	350
N-Nitrosodiphenylamine	340	U	340	350	U	350	350	U	350	350	U	350
Naphthalene	340	U	340	33	J	350	350	U	350	350	U	350
Nitrobenzene	340	U	340	350	U	350	350	U	350	350	U	350
Pentachlorophenol	860	UJ	860	860	UJ	860	870	UJ	870	870	UJ	870
Phenanthrene	33	J	340	52	J	350	350	U	350	350	U	350
Phenol	340	U	340	350	U	350	350	U	350	350	U	350
Pyrene	19	J	340	27	J	350	350	U	350	350	U	350

Attachment	1	Sheet No.	12 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

Attachment 1. 126-B-3 Verification Sampling Results.

Constituent	J030R9 Equipment Blank Sample Date 04/15/05		
	µg/kg	Q	PQL
PCBs			
Aroclor-1016	13	U	13
Aroclor-1221	13	U	13
Aroclor-1232	13	U	13
Aroclor-1242	13	U	13
Aroclor-1248	13	U	13
Aroclor-1254	13	U	13
Aroclor-1260	13	U	13
SOVAs			
1,2,4-Trichlorobenzene	330	U	330
1,2-Dichlorobenzene	330	U	330
1,3-Dichlorobenzene	330	U	330
1,4-Dichlorobenzene	330	U	330
2,4,5-Trichlorophenol	830	UJ	830
2,4,6-Trichlorophenol	330	UJ	330
2,4-Dichlorophenol	330	U	330
2,4-Dimethylphenol	330	U	330
2,4-Dinitrophenol	830	U	830
2,4-Dinitrotoluene	330	U	330
2,6-Dinitrotoluene	330	U	330
2-Chloronaphthalene	330	U	330
2-Chlorophenol	330	U	330
2-Methylnaphthalene	330	U	330
2-Methylphenol (cresol, o-)	330	U	330
2-Nitroaniline	830	U	830
2-Nitrophenol	330	U	330
3+4 Methylphenol (cresol, m+p)	330	U	330
3,3'-Dichlorobenzidine	330	U	330
3-Nitroaniline	830	U	830
4,6-Dinitro-2-methylphenol	830	U	830
4-Bromophenylphenyl ether	330	U	330
4-Chloro-3-methylphenol	330	U	330
4-Chloroaniline	330	U	330
4-Chlorophenylphenyl ether	330	U	330
4-Nitroaniline	830	U	830
4-Nitrophenol	830	U	830
Acenaphthene	330	U	330

Constituent	J030R9 Equipment Blank Sample Date 04/15/05		
	µg/kg	Q	PQL
SOVAs (continued)			
Acenaphthylene	330	U	330
Anthracene	330	U	330
Benzo(a)anthracene	330	U	330
Benzo(a)pyrene	330	U	330
Benzo(b)fluoranthene	330	U	330
Benzo(ghi)perylene	330	U	330
Benzo(k)fluoranthene	330	U	330
Bis(2-chloro-1-methylethyl)ether	330	U	330
Bis(2-Chloroethoxy)methane	330	U	330
Bis(2-chloroethyl) ether	330	U	330
Bis(2-ethylhexyl) phthalate	660	U	660
Butylbenzylphthalate	330	U	330
Carbazole	330	U	330
Chrysene	330	U	330
Di-n-butylphthalate	660	U	660
Di-n-octylphthalate	330	U	330
Dibenz[a,h]anthracene	330	U	330
Dibenzofuran	330	U	330
Diethylphthalate	41	J	330
Dimethyl phthalate	330	U	330
Fluoranthene	330	U	330
Fluorene	330	U	330
Hexachlorobenzene	330	U	330
Hexachlorobutadiene	330	U	330
Hexachlorocyclopentadiene	330	U	330
Hexachloroethane	330	U	330
Indeno(1,2,3-cd)pyrene	330	U	330
Isophorone	330	U	330
N-Nitroso-di-n-dipropylamine	330	U	330
N-Nitrosodiphenylamine	330	U	330
Naphthalene	330	U	330
Nitrobenzene	330	U	330
Pentachlorophenol	830	UJ	830
Phenanthrene	330	U	330
Phenol	330	U	330
Pyrene	330	U	330

Attachment	1	Sheet No.	13 of 13
Originator	J. M. Capron	Date	08/23/05
Checked	T. B. Miley	Date	
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0260	Rev. No.	0

CALCULATION COVER SHEET

Project Title:	100-B/C Area Field Remediation	**Job No.**	14655
Area	100-B/C		
Discipline	Environmental	***Calc. No.**	0100B-CA-V0267
Subject	126-B-3 Staging Area Cleanup Verification 95% UCL Calculations		
Computer Program	Excel	**Program No.**	Excel 2003

The attached calculations have been generated to document compliance with established cleanup levels. These documents 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 = 8 Attm. 1 = 8 Total = 17	12/5/05 J. M. Capron	12/6/05 T. M. Blakley	12/8/05 L. M. Dittmer	D. N. Strom	12-8-05

SUMMARY OF REVISIONS

* Obtain calc no. from DIS

DE01437.03 (12/09/2004)

Washington Closure Hanford CALCULATION SHEET

Originator J. M. Capron Date 12/06/05 Calc. No. 0100B-CA-V0267 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 12/6/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations Sheet No. 1 of 8

Summary

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

Table of Contents:

Given/References:

1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets)*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II)*, Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-94/013. U.S. Environmental Protection Agency, Washington, D.C.
10) 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 2005b). 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 data from soil verification samples from the staging area of the 126-B-3 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 2005b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:
For nonradioactive analytes with ≤50% of the data below detection limits and all radionuclide analytes, 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, the maximum detected value for the data set is used instead of the 95% UCL. The evaluation of the portion of the data set below detection limits was performed by direct inspection of the attached sample results. All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). No nonradionuclide COCs/COPCs were identified for this site.

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 ($n < 10$) and all radionuclide data sets, 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).

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 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, listed in Table II-1 of the SAP (DOE-RL 2005a). 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. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for regulatory split data), further investigation regarding the usability of the data is performed. No split samples were collected for cleanup verification of the subject site. Additional discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

Washington Closure Hanford CALCULATION SHEET

Originator J. M. Capron Date 12/06/05 Calc. No. C1008-CA-V0267 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 12/15/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations Sheet No. 12 of 8

Summary (continued)

Results:
The results presented in the summary tables that follow are for use in risk analysis and the RSVP for this site.

Results Summary - Staging Area			
Analyte	95% UCL[a]	Maximum[b]	Units
Arsenic	4.8		mg/kg
Barium	72.1		mg/kg
Beryllium	0.9		mg/kg
Boron		3.4	mg/kg
Chromium (total)	9.6		mg/kg
Hexavalent chromium	2.7		mg/kg
Cobalt	7.3		mg/kg
Copper	17.2		mg/kg
Lead	5.3		mg/kg
Manganese	311		mg/kg
Mercury		0.03	mg/kg
Nickel	11.6		mg/kg
Vanadium	38.9		mg/kg
Zinc	39.9		mg/kg
Aroclor-1260		0.053	mg/kg
beta-Hexachlorocyclohexane		0.009	mg/kg
Dichlorodiphenyltrichloroethane		0.0062	mg/kg
Endosulfan sulfate		0.0029	mg/kg
Endrin aldehyde		0.0026	mg/kg
Endrin ketone		0.0019	mg/kg
gamma-Chlordane		0.0024	mg/kg
2-Methylnaphthalene	0.17		mg/kg
Anthracene		0.042	mg/kg
Benzo(a)anthracene		0.12	mg/kg
Benzo(a)pyrene		0.091	mg/kg
Benzo(b)fluoranthene		0.075	mg/kg
Benzo(g,h,i)perylene		0.046	mg/kg
Benzo(k)fluoranthene		0.085	mg/kg
Carbazole		0.025	mg/kg
Chrysene		0.14	mg/kg
Dibenz(a,h)anthracene		0.017	mg/kg
Dibenzofuran		0.06	mg/kg
Di-n-butylphthalate	0.11		mg/kg
Fluoranthene		0.23	mg/kg
Fluorene		0.021	mg/kg
Indeno(1,2,3-cd)pyrene		0.042	mg/kg
Naphthalene		0.14	mg/kg
Phenanthrene	0.17		mg/kg
Pyrene		0.29	mg/kg

WAC 173-340-740(7)(e) Evaluation

WAC 3-Part Test for most stringent cleanup limit:	
95% UCL > Cleanup Limit?	NO
> 10% above Cleanup Limit?	NO
Any sample > 2x Cleanup Limit?	NO

Residual hexavalent chromium concentrations fail the MTCA 3-part test. Additional remediation of the staging area is required.

Note: All data sets meet the 3-part test criteria when compared to direct exposure cleanup limits, with the exception of hexavalent chromium.

[a] For nonradionuclides, where ≤ 50% of a data set is censored (below detection limits), the 95% UCL value is used for a given analyte.
[b] For nonradionuclides, where > 50% of a data set is censored, the statistical value defaults to the maximum detected value in the data set.
MTCA = *Model Toxic Control Act*
UCL = upper confidence level
WAC = *Washington Administrative Code*

Relative Percent Difference Results[a] - QA/QC Analysis	
Analyte	Duplicate Analysis
Barium	5.6%
Chromium (total)	16%
Copper	1.5%
Manganese	8.9%
Vanadium	22%
Zinc	12%

[a] RPD evaluation was not required for analytes not included in this table
QA/QC = quality assurance/quality control

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron JMC Date 12/06/05 Calc. No. 0100B-CA-V0267 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley TMB Date 12/6/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations Sheet No. 3 of 8

Staging Area Verification Data

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Chromium (total) mg/kg	Q	PQL	Hexavalent Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL
1	J03WD8	8/9/2005	5.2	C	2.3	64.1	C	0.10	0.94		0.05	9.4	C	0.36	0.20	U	0.20	6.9		0.46	13.2	C	0.41	5.5		1.3
Duplicate of J03WD8	J03WD9	8/9/2005	3.3	C	2.3	60.6	C	0.10	0.78		0.05	8.0	C	0.36	0.29		0.20	6.0		0.46	13.0	C	0.41	5.2		1.3
2	J03WF0	8/9/2005	4.7	C	2.3	62.9	C	0.10	1.0		0.05	8.7	C	0.36	0.26		0.20	7.8		0.46	18.0	C	0.41	4.5		1.3
3	J03WF1	8/9/2005	3.3	C	2.3	56.9	C	0.10	0.89		0.05	7.5	C	0.36	0.21		0.20	6.7		0.46	15.2	C	0.41	3.8		1.3
4	J03WF2	8/9/2005	4.1	C	2.3	51.5	C	0.10	0.76		0.05	8.9	C	0.36	0.23		0.20	5.5		0.46	12.8	C	0.41	3.5		1.3
5	J03WF3	8/9/2005	3.9	C	2.3	67.5	C	0.10	1.0		0.05	7.1	C	0.36	0.31		0.20	7.4		0.46	18.1	C	0.41	5.0		1.3
6	J03WF4	8/9/2005	4.4	C	2.3	55.1	C	0.10	0.67		0.05	8.3	C	0.36	0.22		0.20	4.9		0.46	11.4	C	0.41	2.6		1.3
7	J03WF5	8/9/2005	3.0	C	2.3	65.2	C	0.10	0.61		0.05	7.6	C	0.36	0.43		0.20	5.2		0.46	14.1	C	0.41	3.7		1.3
8	J03WF6	8/9/2005	2.3	UC	2.3	64.7	C	0.10	0.74		0.05	6.5	C	0.36	8.5		2.0	5.9		0.46	12.5	C	0.41	3.1		1.3
9	J03WF7	8/9/2005	4.4	C	2.3	75.3	C	0.10	0.70		0.05	9.0	C	0.36	2.0	U	2.0	5.7		0.47	14.5	C	0.41	6.1		1.3
10	J03WF8	8/9/2005	7.0	C	2.3	90.5	C	0.10	1.1		0.05	13.4	C	0.36	2.1		2.0	9.2		0.46	21.7	C	0.41	5.9		1.3

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Chromium (total) mg/kg	Hexavalent Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg
1	J03WD8/ J03WD9	8/9/2005	4.3	62.4	0.86	8.7	0.20	6.5	13.1	5.4
2	J03WF0	8/9/2005	4.7	62.9	1.0	8.7	0.26	7.8	18.0	4.5
3	J03WF1	8/9/2005	3.3	56.9	0.89	7.5	0.21	6.7	15.2	3.8
4	J03WF2	8/9/2005	4.1	51.5	0.76	8.9	0.23	5.5	12.8	3.5
5	J03WF3	8/9/2005	3.9	67.5	1.0	7.1	0.31	7.4	18.1	5.0
6	J03WF4	8/9/2005	4.4	55.1	0.67	8.3	0.22	4.9	11.4	2.6
7	J03WF5	8/9/2005	3.0	65.2	0.61	7.6	0.43	5.2	14.1	3.7
8	J03WF6	8/9/2005	1.2	64.7	0.74	6.5	8.5	5.9	12.5	3.1
9	J03WF7	8/9/2005	4.4	75.3	0.70	9.0	1.0	5.7	14.5	6.1
10	J03WF8	8/9/2005	7.0	90.5	1.1	13.4	2.1	9.2	21.7	5.9

Statistical Computations

	Arsenic	Barium	Beryllium	Chromium (total)	Hexavalent Chromium	Cobalt	Copper	Lead
Statistical value based on	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), 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	10	10	10	10	10	10	10	10
% < Detection limit	10%	0%	0%	0%	10%	0%	0%	0%
mean	4.0	65.2	0.8	8.6	1.3	6.5	15.1	4.4
standard deviation	1.5	11.2	0.2	1.9	2.6	1.3	3.2	1.2
95% UCL on mean	4.8	72.1	0.9	9.6	2.7	7.3	17.2	5.3
maximum value	7	90.5	1.1	13.4	8.5	9.2	21.7	6.1
Statistical value	4.8	72.1	0.9	9.6	2.7	7.3	17.2	5.3
Most Stringent Cleanup Limit for nonradionuclide and RAG type	20 BG/Direct Exposure/GW & River Protection	132 BG/GW Protection	1.51 BG/GW & River Protection	18.5 BG/GW & River Protection	2.0 River Protection	32 GW Protection	22.0 BG/River Protection	10.2 BG/GW & River Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NA	NA	NA	NA	YES	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA	NA	YES	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	YES	NA	NA	NA
WAC 173-340 Compliance? NO	Because all values are below background (20 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (132 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (1.51 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (18.5 mg/kg), the MTCA 3-part test is not required.	Residual hexavalent chromium concentrationss fail the MTCA 3-part test when compared against the soil RAG for river protection. Residual concentrations also exceed the direct exposure RAG. Additional remediation required.	Because all values are below background (15.7 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (22.0 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (10.2 mg/kg), the MTCA 3-part test is not required.

Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Chromium (total) mg/kg	Q	PQL	Hexavalent Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Lead mg/kg	Q	PQL
1	J03WD8	8/9/2005	5.2	C	2.3	64.1	C	0.10	0.94		0.05	9.4	C	0.36	0.20	U	0.20	6.9		0.46	13.2	C	0.41	5.5		1.3
Duplicate of J03WD8	J03WD9	8/9/2005	3.3	C	2.3	60.6	C	0.10	0.78		0.05	8.0	C	0.36	0.29		0.20	6.0		0.46	13.0	C	0.41	5.2		1.3
TDL			10			2			0.5			1			0.5			2			1			5		
Duplicate Analysis: Both > PQL?			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			No-Stop (acceptable)			Yes (continue)			Yes (continue)			Yes (continue)		
Duplicate Analysis: Both >5xTDL?			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)						No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)		
Duplicate Analysis: RPD						5.6%						16%									1.5%					

BG = background
C = blank contamination
GW = groundwater
HEIS = Hanford Environmental Information System
MTCA = *Model Toxic Control Act*
NA = not applicable
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RPD = relative percent difference
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = *Washington Administrative Code*

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron JMC Date 12/06/05 Calc. No. 0100B-CA-V0267 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley TMB Date 12/6/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations Sheet No. 4 of 8

1 Staging Area Verification Data

2 Sampling Area	HEIS Number	Sample Date	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	2-Methylnaphthalene mg/kg	Q	PQL	Di-n-butylphthalate mg/kg	Q	PQL	Phenanthrene mg/kg	Q	PQL
4 1	J03WD8	8/9/2005	316	C	0.10	10.0		1.1	41.6		0.31	37.8		0.26	0.33	UJ	0.33	0.025	J	0.33	0.019	J	0.33
5 Duplicate of J03WD8	J03WD9	8/9/2005	289	C	0.10	9.1		1.1	33.2		0.31	33.4		0.26	0.33	UJ	0.33	0.041	J	0.33	0.028	J	0.33
6 2	J03WF0	8/9/2005	338	C	0.10	11.9		1.1	41.1		0.31	40.1		0.26	0.34	UJ	0.34	0.032	J	0.34	0.34	U	0.34
7 3	J03WF1	8/9/2005	286	C	0.10	9.2		1.1	35.4		0.31	39.7		0.26	0.031	J	0.34	0.033	J	0.34	0.032	J	0.34
8 4	J03WF2	8/9/2005	246	C	0.10	10.0		1.1	31.1		0.31	32.9		0.26	0.34	UJ	0.34	0.037	J	0.34	0.34	U	0.34
9 5	J03WF3	8/9/2005	301	C	0.10	10.9		1.1	38.2		0.31	35.9		0.26	0.34	UJ	0.34	0.022	J	0.34	0.34	U	0.34
10 6	J03WF4	8/9/2005	229	C	0.10	9.1		1.1	27.4		0.31	28.9		0.26	0.33	UJ	0.33	0.027	J	0.33	0.33	U	0.33
11 7	J03WF5	8/9/2005	250	C	0.10	8.3		1.1	24.5		0.31	31.3		0.26	0.024	J	0.34	0.025	J	0.34	0.34	U	0.34
12 8	J03WF6	8/9/2005	285	C	0.10	8.3		1.1	27.6		0.31	33.4		0.26	0.14	J	0.34	0.043	J	0.34	0.22	J	0.34
13 9	J03WF7	8/9/2005	245	C	0.10	10.4		1.1	25.2		0.31	40.8		0.26	0.23	DJ	0.67	0.67	UD	0.67	0.17	DJ	0.67
14 10	J03WF8	8/9/2005	358	C	0.10	16.0		1.1	48.3		0.30	46.4		0.25	0.074	J	0.34	0.021	J	0.34	0.062	J	0.34

15

16 Statistical Computation Input Data

17 Sampling Area	18 HEIS Number	Sample Date	Manganese mg/kg	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg	2-Methylnaphthalene mg/kg	Di-n-butylphthalate mg/kg	Phenanthrene mg/kg
19 1	J03WD8/ J03WD9	8/9/2005	303	9.6	37.4	35.6	0.17	0.033	0.024
20 2	J03WF0	8/9/2005	338	11.9	41.1	40.1	0.17	0.032	0.17
21 3	J03WF1	8/9/2005	286	9.2	35.4	39.7	0.031	0.033	0.032
22 4	J03WF2	8/9/2005	246	10.0	31.1	32.9	0.17	0.037	0.17
23 5	J03WF3	8/9/2005	301	10.9	38.2	35.9	0.17	0.022	0.17
24 6	J03WF4	8/9/2005	229	9.1	27.4	28.9	0.17	0.027	0.17
25 7	J03WF5	8/9/2005	250	8.3	24.5	31.3	0.024	0.025	0.17
26 8	J03WF6	8/9/2005	285	8.3	27.6	33.4	0.14	0.043	0.22
27 9	J03WF7	8/9/2005	245	10.4	25.2	40.8	0.23	0.34	0.17
28 10	J03WF8	8/9/2005	358	16.0	48.3	46.4	0.074	0.021	0.062

29

30 Statistical Computations

31	Manganese	Nickel	Vanadium	Zinc	2-Methylnaphthalene	Di-n-butylphthalate	Phenanthrene
32 Statistical value based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), 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.
33 N	10	10	10	10	10	10	10
34 % < Detection limit	0%	0%	0%	0%	50%	10%	50%
35 mean	284	10.4	33.6	36.5	0.13	0.06	0.14
36 standard deviation	42	2.3	7.8	5.3	0.07	0.10	0.07
37 95% UCL on mean	311	11.6	38.9	39.9	0.17	0.11	0.17
38 maximum value	358	16.0	48.3	46.4	0.34	0.67	0.34
39 Statistical value	311	11.6	38.9	39.9	0.17	0.11	0.17
40 **Most Stringent Cleanup Limit for nonradionuclide and RAG type**	512 BG/GW Protection	19.1 BG/GW Protection	85.1 BG/GW Protection	67.8 BG/River Protection	3.2 GW Protection	160 GW Protection	240 GW Protection
41 **WAC 173-340 3-PART TEST**							
42 95% UCL > Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
43 > 10% above Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
44 Any sample > 2X Cleanup Limit?	NA	NA	NA	NA	NO	NO	NO
45 46 47 48 **WAC 173-340 Compliance? YES**	Because all values are below background (512 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (19.1 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (85.1 mg/kg), the MTCA 3-part test is not required.	Because all values are below background (67.8 mg/kg), the MTCA 3-part test is not required.	The data set meets the 3-part test criteria when compared to the most stringent cleanup limit.	The data set meets the 3-part test criteria when compared to the most stringent cleanup limit.	The data set meets the 3-part test criteria when compared to the most stringent cleanup limit.

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50 Duplicate Analysis

51 Sampling Area	HEIS Number	Sample Date	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL	2-Methylnaphthalene mg/kg	Q	PQL	Di-n-butylphthalate mg/kg	Q	PQL	Phenanthrene mg/kg	Q	PQL
53 1	J03WD8	8/9/2005	316	C	0.10	10.0		1.1	41.6		0.31	37.8		0.26	0.33	UJ	0.33	0.025	J	0.33	0.019	J	0.33
54 Duplicate of J03WD8	J03WD9	8/9/2005	289	C	0.10	9.1		1.1	33.2		0.31	33.4		0.26	0.33	UJ	0.33	0.041	J	0.33	0.028	J	0.33
55	(TDL)		5			4			2.5			1			0.33			0.33			0.33		
56 Duplicate Analysis	Both > PQL?		Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			No-Stop (acceptable)			No-Stop (acceptable)			No-Stop (acceptable)		
57	Both >5xTDL?		Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)											
58	RPD		8.9%						22%			12%											

59 BG = background
60 C = blank contamination
61 D = diluted
62 GW = groundwater
63 HEIS = Hanford Environmental Information System
64 J = estimated
65 MTCA = *Model Toxic Control Act*
66 NA = not applicable
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RPD = relative percent difference
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = *Washington Administrative Code*

Washington Closure Hanford

CALCULATION SHEET

Originator J. M. Capron — Date 12/06/05 — Calc. No. 0100B-CA-V0267 — Rev. No. 0
Project 100-B/C Area Field Remediation — Job No. 14655 — Checked T. M. Blakley — Date 12/6/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations — Sheet No. 5 of 8

Ecology Software (MTCAStat) Results

Arsenic 95% UCL Calculation

DATA	ID
4.3	J03WD8/J03WD9
4.7	J03WF0
3.3	J03WF1
4.1	J03WF2
3.9	J03WF3
4.4	J03WF4
3.0	J03WF5
1.2	J03WF6
4.4	J03WF7
7.0	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	4.0
Censored		Lognormal mean	4.1
Detection limit or PQL		Std. devn.	1.5
Method detection limit		Median	4.2
TOTAL	10	Min.	1.2
		Max.	7.0

Lognormal distribution? — Normal distribution?
r-squared is: 0.769 — r-squared is: 0.879
Recommendations.
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 4.8

Barium 95% UCL Calculation

DATA	ID
62.4	J03WD8/J03WD9
62.9	J03WF0
56.9	J03WF1
51.5	J03WF2
67.5	J03WF3
55.1	J03WF4
65.2	J03WF5
64.7	J03WF6
75.3	J03WF7
90.5	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	65.2
Censored		Lognormal mean	65.3
Detection limit or PQL		Std. devn.	11.2
Method detection limit		Median	63.8
TOTAL	10	Min.	51.5
		Max.	90.5

Lognormal distribution? — Normal distribution?
r-squared is: 0.932 — r-squared is: 0.884
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 72.1

Beryllium 95% UCL Calculation

DATA	ID
0.86	J03WD8/J03WD9
1.0	J03WF0
0.89	J03WF1
0.76	J03WF2
1.0	J03WF3
0.67	J03WF4
0.61	J03WF5
0.74	J03WF6
0.70	J03WF7
1.1	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	0.8
Censored		Lognormal mean	0.8
Detection limit or PQL		Std. devn.	0.2
Method detection limit		Median	0.8
TOTAL	10	Min.	0.61
		Max.	1.1

Lognormal distribution? — Normal distribution?
r-squared is: 0.972 — r-squared is: 0.963
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.9

Chromium 95% UCL Calculation

DATA	ID
8.7	J03WD8/J03WD9
8.7	J03WF0
7.5	J03WF1
8.9	J03WF2
7.1	J03WF3
8.3	J03WF4
7.6	J03WF5
6.5	J03WF6
9.0	J03WF7
13.4	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	8.6
Censored		Lognormal mean	8.6
Detection limit or PQL		Std. devn.	1.9
Method detection limit		Median	8.5
TOTAL	10	Min.	6.5
		Max.	13.4

Lognormal distribution? — Normal distribution?
r-squared is: 0.845 — r-squared is: 0.758
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 9.6

Washington Closure Hanford

CALCULATION SHEET

Originator J. M. Capron — Date 12/06/05 — Calc. No. 0100B-CA-V0267 — Rev. No. 0
Project 100-B/C Area Field Remediation — Job No. 14655 — Checked T. M. Blakley — Date 12/6/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations — Sheet No. 6 of 8

Ecology Software (MTCAStat) Results

Hexavalent Chromium 95% UCL Calculation

DATA	ID
0.20	J03WD8/J03WD9
0.26	J03WF0
0.21	J03WF1
0.23	J03WF2
0.31	J03WF3
0.22	J03WF4
0.43	J03WF5
8.5	J03WF6
1.0	J03WF7
2.1	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	1.3
Censored		Lognormal mean	1.1
Detection limit or PQL		Std. devn.	2.6
Method detection limit		Median	0.3
TOTAL	10	Min.	0.20
		Max.	8.5

Lognormal distribution? — Normal distribution?
r-squared is: 0.783 — r-squared is: 0.491
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 2.7

Cobalt 95% UCL Calculation

DATA	ID
6.5	J03WD8/J03WD9
7.8	J03WF0
6.7	J03WF1
5.5	J03WF2
7.4	J03WF3
4.9	J03WF4
5.2	J03WF5
5.9	J03WF6
5.7	J03WF7
9.2	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	6.5
Censored		Lognormal mean	6.5
Detection limit or PQL		Std. devn.	1.3
Method detection limit		Median	6.2
TOTAL	10	Min.	4.9
		Max.	9.2

Lognormal distribution? — Normal distribution?
r-squared is: 0.970 — r-squared is: 0.936
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 7.3

Copper 95% UCL Calculation

DATA	ID
13.1	J03WD8/J03WD9
18.0	J03WF0
15.2	J03WF1
12.8	J03WF2
18.1	J03WF3
11.4	J03WF4
14.1	J03WF5
12.5	J03WF6
14.5	J03WF7
21.7	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	15.1
Censored		Lognormal mean	15.2
Detection limit or PQL		Std. devn.	3.2
Method detection limit		Median	14.3
TOTAL	10	Min.	11.4
		Max.	21.7

Lognormal distribution? — Normal distribution?
r-squared is: 0.946 — r-squared is: 0.907
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 17.2

Lead 95% UCL Calculation

DATA	ID
5.4	J03WD8/J03WD9
4.5	J03WF0
3.8	J03WF1
3.5	J03WF2
5.0	J03WF3
2.6	J03WF4
3.7	J03WF5
3.1	J03WF6
6.1	J03WF7
5.9	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	4.4
Censored		Lognormal mean	4.4
Detection limit or PQL		Std. devn.	1.2
Method detection limit		Median	4.2
TOTAL	10	Min.	2.6
		Max.	6.1

Lognormal distribution? — Normal distribution?
r-squared is: 0.971 — r-squared is: 0.968
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.3

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CALCULATION SHEET

Originator J. M. Capron JMC — Date 12/06/05 — Calc. No. 0100B-CA-V0267 — Rev. No. 0

Project 100-B/C Area Field Remediation — Job No. 14655 — Checked T. M. Blakley 2m13 — Date 12/6/05

Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations — Sheet No. 7 of 8

Ecology Software (MTCAStat) Results

Manganese 95% UCL Calculation

DATA	ID
303	J03WD8/J03WD9
338	J03WF0
286	J03WF1
246	J03WF2
301	J03WF3
229	J03WF4
250	J03WF5
285	J03WF6
245	J03WF7
358	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	284
Censored		Lognormal mean	284
Detection limit or PQL		Std. devn.	42
Method detection limit		Median	286
TOTAL	10	Min.	229
		Max.	358

Lognormal distribution? — Normal distribution?

r-squared is: 0.955 — r-squared is: 0.946

Recommendations:

Use lognormal distribution.

UCL (Land's method) is 311

Nickel 95% UCL Calculation

DATA	ID
9.6	J03WD8/J03WD9
11.9	J03WF0
9.2	J03WF1
10.0	J03WF2
10.9	J03WF3
9.1	J03WF4
8.3	J03WF5
8.3	J03WF6
10.4	J03WF7
16.0	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	10.4
Censored		Lognormal mean	10.4
Detection limit or PQL		Std. devn.	2.3
Method detection limit		Median	9.8
TOTAL	10	Min.	8.3
		Max.	16.0

Lognormal distribution? — Normal distribution?

r-squared is: 0.871 — r-squared is: 0.796

Recommendations:

Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 11.6

Vanadium 95% UCL Calculation

DATA	ID
37.4	J03WD8/J03WD9
41.1	J03WF0
35.4	J03WF1
31.1	J03WF2
38.2	J03WF3
27.4	J03WF4
24.5	J03WF5
27.6	J03WF6
25.2	J03WF7
48.3	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	33.6
Censored		Lognormal mean	33.7
Detection limit or PQL		Std. devn.	7.8
Method detection limit		Median	33.3
TOTAL	10	Min.	24.5
		Max.	48.3

Lognormal distribution? — Normal distribution?

r-squared is: 0.959 — r-squared is: 0.944

Recommendations:

Use lognormal distribution.

UCL (Land's method) is 38.9

Zinc 95% UCL Calculation

DATA	ID
35.6	J03WD8/J03WD9
40.1	J03WF0
39.7	J03WF1
32.9	J03WF2
35.9	J03WF3
28.9	J03WF4
31.3	J03WF5
33.4	J03WF6
40.8	J03WF7
46.4	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	36.5
Censored		Lognormal mean	36.5
Detection limit or PQL		Std. devn.	5.3
Method detection limit		Median	35.8
TOTAL	10	Min.	28.9
		Max.	46.4

Lognormal distribution? — Normal distribution?

r-squared is: 0.979 — r-squared is: 0.966

Recommendations:

Use lognormal distribution.

UCL (Land's method) is 39.9

Washington Closure Hanford

CALCULATION SHEET

Originator J. M. Capron **Date** 12/06/05 **Calc. No.** 0100B-CA-V0267 **Rev. No.** 0
Project 100-B/C Area Field Remediation **Job No.** 14655 **Checked** T. M. Blakley **Date** 12/6/05
Subject 126-B-3 Staging Area Cleanup Verification 95% UCL Calculations **Sheet No.** 8 of 8

Ecology Software (MTCAStat) Results

2-Methylnaphthalene 95% UCL Calculation

DATA	ID
0.17	J03WD8/J03WD9
0.17	J03WF0
0.031	J03WF1
0.17	J03WF2
0.17	J03WF3
0.17	J03WF4
0.024	J03WF5
0.14	J03WF6
0.23	J03WF7
0.074	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	0.13
Censored		Lognormal mean	0.15
Detection limit or PQL		Std. devn.	0.07
Method detection limit		Median	0.17
TOTAL	10	Min.	0.024
		Max.	0.23

Lognormal distribution? Normal distribution?
r-squared is: 0.762 r-squared is: 0.859
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 0.17

Di-n-butylphthalate 95% UCL Calculation

DATA	ID
0.033	J03WD8/J03WD9
0.032	J03WF0
0.033	J03WF1
0.037	J03WF2
0.022	J03WF3
0.027	J03WF4
0.025	J03WF5
0.043	J03WF6
0.34	J03WF7
0.021	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	0.06
Censored		Lognormal mean	0.05
Detection limit or PQL		Std. devn.	0.10
Method detection limit		Median	0.03
TOTAL	10	Min.	0.021
		Max.	0.34

Lognormal distribution? Normal distribution?
r-squared is: 0.610 r-squared is: 0.400
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 0.11

Phenanthrene 95% UCL Calculation

DATA	ID
0.024	J03WD8/J03WD9
0.17	J03WF0
0.032	J03WF1
0.17	J03WF2
0.17	J03WF3
0.17	J03WF4
0.17	J03WF5
0.22	J03WF6
0.17	J03WF7
0.062	J03WF8

Number of samples		Uncensored values	
Uncensored	10	Mean	0.14
Censored		Lognormal mean	0.15
Detection limit or PQL		Std. devn.	0.07
Method detection limit		Median	0.17
TOTAL	10	Min.	0.024
		Max.	0.22

Lognormal distribution? Normal distribution?
r-squared is: 0.726 r-squared is: 0.781
Recommendations:
Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (based on Z-statistic) is 0.17

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Cadmium			Chromium (total)			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	mg/kg	Q	PQL
1	J03WD8	8/9/05	5.2	C	2.3	64.1	C	0.10	0.94		0.05	2.4		1.2	0.15	UC	0.15	9.4	C	0.36	0.20	U	0.20
Duplicate of J03WD8	J03WD9	8/9/05	3.3	C	2.3	60.6	C	0.10	0.78		0.05	1.2	U	1.2	0.15	UC	0.15	8.0	C	0.36	0.29		0.20
2	J03WF0	8/9/05	4.7	C	2.3	62.9	C	0.10	1.0		0.05	1.2	U	1.2	0.15	UC	0.15	8.7	C	0.36	0.26		0.20
3	J03WF1	8/9/05	3.3	C	2.3	56.9	C	0.10	0.89		0.05	1.2	U	1.2	0.15	UC	0.15	7.5	C	0.36	0.21		0.20
4	J03WF2	8/9/05	4.1	C	2.3	51.5	C	0.10	0.76		0.05	1.2	U	1.2	0.15	UC	0.15	8.9	C	0.36	0.23		0.20
5	J03WF3	8/9/05	3.9	C	2.3	67.5	C	0.10	1.0		0.05	1.2	U	1.2	0.15	UC	0.15	7.1	C	0.36	0.31		0.20
6	J03WF4	8/9/05	4.4	C	2.3	55.1	C	0.10	0.67		0.05	1.2	U	1.2	0.15	UC	0.15	8.3	C	0.36	0.22		0.20
7	J03WF5	8/9/05	3.0	C	2.3	65.2	C	0.10	0.61		0.05	1.2	U	1.2	0.15	UC	0.15	7.6	C	0.36	0.43		0.20
8	J03WF6	8/9/05	2.3	UC	2.3	64.7	C	0.10	0.74		0.05	1.2	U	1.2	0.15	UC	0.15	6.5	C	0.36	8.5		2.0
9	J03WF7	8/9/05	4.4	C	2.3	75.3	C	0.10	0.70		0.05	1.7		1.2	0.16	UC	0.16	9.0	C	0.36	2.0	U	2.0
10	J03WF8	8/9/05	7.0	C	2.3	90.5	C	0.10	1.1		0.05	3.4		1.2	0.15	UC	0.15	13.4	C	0.36	2.1		2.0
Equipment Blank	J03WJ0	8/9/05	0.38	UC	0.38	0.82	C	0.02	0.009		0.008	0.41		0.19	0.03	UC	0.03	0.06	UC	0.06			

Sample Location	HEIS Number	Sample Date	Cobalt			Copper			Lead			Manganese			Mercury			Molybdenum			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J03WD8	8/9/05	6.9		0.46	13.2	C	0.41	5.5		1.3	316	C	0.10	0.01	U	0.01	1.1	UJ	1.1	10.0		1.1
Duplicate of J03WD8	J03WD9	8/9/05	6.0		0.46	13.0	C	0.41	5.2		1.3	289	C	0.10	0.02	U	0.02	0.82	UC	0.82	9.1		1.1
2	J03WF0	8/9/05	7.8		0.46	18.0	C	0.41	4.5		1.3	338	C	0.10	0.01	U	0.01	0.82	UC	0.82	11.9		1.1
3	J03WF1	8/9/05	6.7		0.46	15.2	C	0.41	3.8		1.3	286	C	0.10	0.01	U	0.01	0.87	UJ	0.87	9.2		1.1
4	J03WF2	8/9/05	5.5		0.46	12.8	C	0.41	3.5		1.3	246	C	0.10	0.01	U	0.01	0.83	UC	0.83	10.0		1.1
5	J03WF3	8/9/05	7.4		0.46	18.1	C	0.41	5.0		1.3	301	C	0.10	0.02	U	0.02	0.99	UJ	0.99	10.9		1.1
6	J03WF4	8/9/05	4.9		0.46	11.4	C	0.41	2.6		1.3	229	C	0.10	0.01	U	0.01	0.90	UJ	0.90	9.1		1.1
7	J03WF5	8/9/05	5.2		0.46	14.1	C	0.41	3.7		1.3	250	C	0.10	0.01	U	0.01	1.2	UJ	1.2	8.3		1.1
8	J03WF6	8/9/05	5.9		0.46	12.5	C	0.41	3.1		1.3	285	C	0.10	0.02		0.02	0.82	UC	0.82	8.3		1.1
9	J03WF7	8/9/05	5.7		0.47	14.5	C	0.41	6.1		1.3	245	C	0.10	0.03		0.02	0.83	UC	0.83	10.4		1.1
10	J03WF8	8/9/05	9.2		0.46	21.7	C	0.41	5.9		1.3	358	C	0.10	0.02		0.01	1.0	UJ	1.0	16.0		1.1
Equipment Blank	J03WJ0	8/9/05	0.08	U	0.08	0.23	UJ	0.23	0.21	U	0.21	2.0	C	0.02	0.02	U	0.02	0.14	UC	0.14	0.19	U	0.19

Sample Location	HEIS Number	Sample Date	Selenium			Silver			Vanadium			Zinc			TPH		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
1	J03WD8	8/9/05	2.5	U	2.5	0.46	UC	0.46	41.6		0.31	37.8		0.26	133	U	133
Duplicate of J03WD8	J03WD9	8/9/05	2.5	U	2.5	0.46	UC	0.46	33.2		0.31	33.4		0.26	133	U	133
2	J03WF0	8/9/05	2.5	U	2.5	0.46	UC	0.46	41.1		0.31	40.1		0.26	133	U	133
3	J03WF1	8/9/05	2.5	U	2.5	0.46	UC	0.46	35.4		0.31	39.7		0.26	134	U	134
4	J03WF2	8/9/05	2.5	U	2.5	0.46	UC	0.46	31.1		0.31	32.9		0.26	134	U	134
5	J03WF3	8/9/05	2.5	U	2.5	0.46	UC	0.46	38.2		0.31	35.9		0.26	134	U	134
6	J03WF4	8/9/05	2.5	U	2.5	0.46	UC	0.46	27.4		0.31	28.9		0.26	133	U	133
7	J03WF5	8/9/05	2.5	U	2.5	0.46	UC	0.46	24.5		0.31	31.3		0.26	133	U	133
8	J03WF6	8/9/05	2.5	U	2.5	0.46	UC	0.46	27.6		0.31	33.4		0.26	133	U	133
9	J03WF7	8/9/05	2.5	U	2.5	0.47	UC	0.47	25.2		0.31	40.8		0.26	134	U	134
10	J03WF8	8/9/05	2.5	U	2.5	0.46	UC	0.46	48.3		0.30	46.4		0.25	133	U	133
Equipment Blank	J03WJ0	8/9/05	0.42	U	0.42	0.08	UC	0.08	0.05	U	0.05	1.2		0.04	133	U	133

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

BHC = hexachlorocyclohexane
C = blank contamination
D = diluted
HEIS = Hanford Environmental Information System
I = interference
J = estimate
PQL = practical quantitation limit
Q = qualifier
TPH = total petroleum hydrocarbons
U = undetected

Attachment	1	Sheet No.	1 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	12/6/05
Calc. No.	0100B-CA-V0267	Rev. No.	0

Sample Location	HEIS Number	Sample Date	Asbestos Results
1	J03WF9	8/9/05	none detected
Duplicate of J03WF9	J03WH0	8/9/05	none detected
2	J03WH1	8/9/05	none detected
3	J03WH2	8/9/05	none detected
4	J03WH3	8/9/05	none detected
5	J03WH4	8/9/05	none detected
6	J03WH5	8/9/05	none detected
7	J03WH6	8/9/05	none detected
8	J03WH7	8/9/05	none detected
9	J03WH8	8/9/05	none detected
10	J03WH9	8/9/05	none detected

Attachment	1	Sheet No.	2 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.*

Constituent	J03WJ0 Equipment Blank Sample Date 8/9/05			J03WD8 Sample Location 1 Sample Date 8/9/05			J03WD9 Duplicate of J03WD8 Sample Date 8/9/05			J03WF0 Sample Location 2 Sample Date 8/9/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls												
Aroclor-1016	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1221	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1232	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1242	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1248	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1254	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1260	13	U	13	13	U	13	13	U	13	13	U	13
Pesticides												
Aldrin				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-BHC				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-Chlordane				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Beta-BHC				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Delta-BHC				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Dichlorodiphenyldichloroethane				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Dichlorodiphenyldichloroethylene				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Dichlorodiphenyltrichloroethane				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Dieldrin				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan I				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan II				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Endosulfan sulfate				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Endrin				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Endrin aldehyde				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Endrin ketone				3.3	U	3.3	3.3	U	3.3	3.4	U	3.4
Gamma-BHC (Lindane)				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
gamma-Chlordane				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor epoxide				1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Methoxychlor				17	U	17	17	U	17	17	U	17
Toxaphene				170	UJ	170	170	UJ	170	170	UJ	170
Semivolatile Organic Analytes												
1,2,4-Trichlorobenzene	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
1,2-Dichlorobenzene	330	U	330	330	U	330	330	U	330	340	U	340
1,3-Dichlorobenzene	330	U	330	330	U	330	330	U	330	340	U	340
1,4-Dichlorobenzene	330	U	330	330	U	330	330	U	330	340	U	340
2,4,5-Trichlorophenol	840	U	840	840	U	840	840	U	840	840	U	840
2,4,6-Trichlorophenol	330	U	330	330	U	330	330	U	330	340	U	340
2,4-Dichlorophenol	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
2,4-Dimethylphenol	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
2,4-Dinitrophenol	840	U	840	840	U	840	840	U	840	840	U	840
2,4-Dinitrotoluene	330	U	330	330	U	330	330	U	330	340	U	340
2,6-Dinitrotoluene	330	U	330	330	U	330	330	U	330	340	U	340
2-Chloronaphthalene	330	U	330	330	U	330	330	U	330	340	U	340
2-Chlorophenol	330	U	330	330	U	330	330	U	330	340	U	340
2-Methylnaphthalene	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
2-Methylphenol (cresol, o-)	330	U	330	330	U	330	330	U	330	340	U	340
2-Nitroaniline	840	U	840	840	U	840	840	U	840	840	U	840
2-Nitrophenol	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340

*TPH data are located with the inorganic data.

Attachment	1	Sheet No.	3 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.

Constituent	J03WJ0 Equipment Blank Sample Date 8/9/05			J03WD8 Sample Location 1 Sample Date 8/9/05			J03WD9 Duplicate of J03WD8 Sample Date 8/9/05			J03WF0 Sample Location 2 Sample Date 8/9/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analytes (continued)												
3,3'-Dichlorobenzidine	330	U	330	330	U	330	330	U	330	340	U	340
4-Methylphenol (p-cresol)	330	U	330	330	U	330	330	U	330	340	U	340
3-Nitroaniline	840	U	840	840	U	840	840	U	840	840	U	840
4,6-Dinitro-2-methylphenol	840	U	840	840	U	840	840	U	840	840	U	840
4-Bromophenyl-phenylether	330	U	330	330	U	330	330	U	330	340	U	340
4-Chloro-3-methylphenol	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
4-Chloroaniline	330	U	330	330	U	330	330	U	330	340	U	340
4-Chlorophenyl-phenylether	330	U	330	330	U	330	330	U	330	340	U	340
4-Nitroaniline	840	UJ	840	840	UJ	840	840	UJ	840	840	UJ	840
4-Nitrophenol	840	U	840	840	U	840	840	U	840	840	U	840
Acenaphthene	330	U	330	330	U	330	330	U	330	340	U	340
Acenaphthylene	330	U	330	330	U	330	330	U	330	340	U	340
Anthracene	330	U	330	330	U	330	330	U	330	340	U	340
Benzo(a)anthracene	330	U	330	330	U	330	330	U	330	340	U	340
Benzo(a)pyrene	330	U	330	330	U	330	330	U	330	340	U	340
Benzo(b)fluoranthene	330	U	330	330	U	330	330	U	330	340	U	340
Benzo(g,h,i)perylene	330	U	330	330	U	330	330	U	330	340	U	340
Benzo(k)fluoranthene	330	U	330	330	U	330	330	U	330	340	U	340
Bis(2-chloro-1-methylethyl)ether	330	U	330	330	U	330	330	U	330	340	U	340
Bis(2-chloroethoxy)methane	330	U	330	330	U	330	330	U	330	340	U	340
Bis(2-chloroethyl) ether	330	U	330	330	U	330	330	U	330	340	U	340
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	330	U	330	330	U	330	330	U	330	340	U	340
Carbazole	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
Chrysene	330	U	330	330	U	330	19	J	330	340	U	340
Dibenz(a,h)anthracene	330	U	330	330	U	330	330	U	330	340	U	340
Dibenzofuran	330	U	330	330	U	330	330	U	330	340	U	340
Diethylphthalate	330	U	330	330	U	330	330	U	330	340	U	340
Dimethylphthalate	330	U	330	330	U	330	330	U	330	340	U	340
Di-n-butylphthalate	150	J	330	25	J	330	41	J	330	32	J	340
Di-n-octylphthalate	330	U	330	330	U	330	330	U	330	340	U	340
Fluoranthene	330	U	330	23	J	330	40	J	330	340	U	340
Fluorene	330	U	330	330	U	330	330	U	330	340	U	340
Hexachlorobenzene	330	U	330	330	U	330	330	U	330	340	U	340
Hexachlorobutadiene	330	U	330	330	U	330	330	U	330	340	U	340
Hexachlorocyclopentadiene	330	U	330	330	U	330	330	U	330	340	U	340
Hexachloroethane	330	U	330	330	U	330	330	U	330	340	U	340
Indeno(1,2,3-cd)pyrene	330	U	330	330	U	330	330	U	330	340	U	340
Isophorone	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
Naphthalene	330	U	330	330	U	330	330	U	330	340	U	340
Nitrobenzene	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
N-Nitroso-di-n-dipropylamine	330	U	330	330	U	330	330	U	330	340	U	340
N-Nitrosodiphenylamine	330	UJ	330	330	UJ	330	330	UJ	330	340	UJ	340
Pentachlorophenol	840	U	840	840	U	840	840	U	840	840	U	840
Phenanthrene	330	U	330	19	J	330	28	J	330	340	U	340
Phenol	330	U	330	330	U	330	330	U	330	340	U	340
Pyrene	330	U	330	25	J	330	36	J	330	340	U	340

Attachment	1	Sheet No.	4 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.

Constituent	J03WF1 Sample Location 3 Sample Date 8/9/05			J03WF2 Sample Location 4 Sample Date 8/9/05			J03WF3 Sample Location 5 Sample Date 8/9/05			J03WF4 Sample Location 6 Sample Date 8/9/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls												
Aroclor-1016	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1221	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1232	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1242	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1248	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1254	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1260	13	U	13	13	U	13	13	U	13	13	U	13
Pesticides												
Aldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Alpha-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Beta-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Delta-BHC	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Dichlorodiphenyldichloroethane	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Dichlorodiphenyldichloroethylene	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Dichlorodiphenyltrichloroethane	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Dieldrin	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan I	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Endosulfan II	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Endosulfan sulfate	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Endrin	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Endrin aldehyde	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Endrin ketone	3.4	U	3.4	3.4	U	3.4	3.4	U	3.4	3.3	U	3.3
Gamma-BHC (Lindane)	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
gamma-Chlordane	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Heptachlor epoxide	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
Methoxychlor	17	U	17	17	U	17	17	U	17	17	U	17
Toxaphene	170	UJ	170	170	UJ	170	170	UJ	170	170	UJ	170
Semivolatile Organic Analytes												
1,2,4-Trichlorobenzene	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
1,2-Dichlorobenzene	340	U	340	340	U	340	340	U	340	330	U	330
1,3-Dichlorobenzene	340	U	340	340	U	340	340	U	340	330	U	330
1,4-Dichlorobenzene	340	U	340	340	U	340	340	U	340	330	U	330
2,4,5-Trichlorophenol	840	U	840	840	U	840	840	U	840	840	U	840
2,4,6-Trichlorophenol	340	U	340	340	U	340	340	U	340	330	U	330
2,4-Dichlorophenol	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
2,4-Dimethylphenol	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
2,4-Dinitrophenol	840	U	840	840	U	840	840	U	840	840	U	840
2,4-Dinitrotoluene	340	U	340	340	U	340	340	U	340	330	U	330
2,6-Dinitrotoluene	340	U	340	340	U	340	340	U	340	330	U	330
2-Chloronaphthalene	340	U	340	340	U	340	340	U	340	330	U	330
2-Chlorophenol	340	U	340	340	U	340	340	U	340	330	U	330
2-Methylnaphthalene	31	J	340	340	UJ	340	340	UJ	340	330	UJ	330
2-Methylphenol (cresol, o-)	340	U	340	340	U	340	340	U	340	330	U	330
2-Nitroaniline	840	U	840	840	U	840	840	U	840	840	U	840
2-Nitrophenol	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330

Attachment	1	Sheet No.	5 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.

Constituent	J03WF1 Sample Location 3 Sample Date 8/9/05			J03WF2 Sample Location 4 Sample Date 8/9/05			J03WF3 Sample Location 5 Sample Date 8/9/05			J03WF4 Sample Location 6 Sample Date 8/9/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analytes (continued)												
3,3'-Dichlorobenzidine	340	U	340	340	U	340	340	U	340	330	U	330
4-Methylphenol (p-cresol)	340	U	340	340	U	340	340	U	340	330	U	330
3-Nitroaniline	840	U	840	840	U	840	840	U	840	840	U	840
4,6-Dinitro-2-methylphenol	840	U	840	840	U	840	840	U	840	840	U	840
4-Bromophenyl-phenylether	340	U	340	340	U	340	340	U	340	330	U	330
4-Chloro-3-methylphenol	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
4-Chloroaniline	340	U	340	340	U	340	340	U	340	330	U	330
4-Chlorophenyl-phenylether	340	U	340	340	U	340	340	U	340	330	U	330
4-Nitroaniline	840	UJ	840	840	UJ	840	840	UJ	840	840	UJ	840
4-Nitrophenol	840	U	840	840	U	840	840	U	840	840	U	840
Acenaphthene	340	U	340	340	U	340	340	U	340	330	U	330
Acenaphthylene	340	U	340	340	U	340	340	U	340	330	U	330
Anthracene	340	U	340	340	U	340	340	U	340	330	U	330
Benzo(a)anthracene	340	U	340	340	U	340	340	U	340	330	U	330
Benzo(a)pyrene	340	U	340	340	U	340	340	U	340	330	U	330
Benzo(b)fluoranthene	340	U	340	340	U	340	340	U	340	330	U	330
Benzo(g,h,i)perylene	340	U	340	340	U	340	340	U	340	330	U	330
Benzo(k)fluoranthene	340	U	340	340	U	340	340	U	340	330	U	330
Bis(2-chloro-1-methylethyl)ether	340	U	340	340	U	340	340	U	340	330	U	330
Bis(2-chloroethoxy)methane	340	U	340	340	U	340	340	U	340	330	U	330
Bis(2-chloroethyl) ether	340	U	340	340	U	340	340	U	340	330	U	330
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	340	U	340	340	U	340	340	U	340	330	U	330
Carbazole	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
Chrysene	340	U	340	340	U	340	340	U	340	330	U	330
Dibenz(a,h)anthracene	340	U	340	340	U	340	340	U	340	330	U	330
Dibenzofuran	340	U	340	340	U	340	340	U	340	330	U	330
Diethylphthalate	340	U	340	340	U	340	340	U	340	330	U	330
Dimethylphthalate	340	U	340	340	U	340	340	U	340	330	U	330
Di-n-butylphthalate	33	J	340	37	J	340	22	J	340	27	J	330
Di-n-octylphthalate	340	U	340	340	U	340	340	U	340	330	U	330
Fluoranthene	340	U	340	340	U	340	340	U	340	330	U	330
Fluorene	340	U	340	340	U	340	340	U	340	330	U	330
Hexachlorobenzene	340	U	340	340	U	340	340	U	340	330	U	330
Hexachlorobutadiene	340	U	340	340	U	340	340	U	340	330	U	330
Hexachlorocyclopentadiene	340	U	340	340	U	340	340	U	340	330	U	330
Hexachloroethane	340	U	340	340	U	340	340	U	340	330	U	330
Indeno(1,2,3-cd)pyrene	340	U	340	340	U	340	340	U	340	330	U	330
Isophorone	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
Naphthalene	340	U	340	340	U	340	340	U	340	330	U	330
Nitrobenzene	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
N-Nitroso-di-n-dipropylamine	340	U	340	340	U	340	340	U	340	330	U	330
N-Nitrosodiphenylamine	340	UJ	340	340	UJ	340	340	UJ	340	330	UJ	330
Pentachlorophenol	840	U	840	840	U	840	840	U	840	840	U	840
Phenanthrene	32	J	340	340	U	340	340	U	340	330	U	330
Phenol	340	U	340	340	U	340	340	U	340	330	U	330
Pyrene	340	U	340	340	U	340	340	U	340	330	U	330

Attachment	1	Sheet No.	6 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.

Constituent	J03WF5 Sample Location 7 Sample Date 8/19/05			J03WF6 Sample Location 8 Sample Date 8/9/05			J03WF7 Sample Location 9 Sample Date 8/9/05			J03WF8 Sample Location 10 Sample Date 8/9/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls												
Aroclor-1016	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1221	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1232	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1242	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1248	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1254	13	U	13	13	U	13	13	U	13	13	U	13
Aroclor-1260	13	U	13	53		13	23		13	13	U	13
Pesticides												
Aldrin	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Alpha-BHC	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Alpha-Chlordane	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Beta-BHC	1.7	U	1.7	2.5		1.7	9.0	ID	8.4	1.7	U	1.7
Delta-BHC	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Dichlorodiphenyldichloroethane	3.4	U	3.4	3.4	U	3.4	17	UD	17	3.4	U	3.4
Dichlorodiphenyldichloroethylene	3.4	U	3.4	3.4	U	3.4	17	UD	17	3.4	U	3.4
Dichlorodiphenyltrichloroethane	3.4	U	3.4	3.4	U	3.4	6.2	JD	17	3.4	U	3.4
Dieldrin	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Endosulfan I	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Endosulfan II	3.4	U	3.4	3.4	U	3.4	17	UD	17	3.4	U	3.4
Endosulfan sulfate	3.4	U	3.4	2.9	J	3.4	2.8	JD	17	3.4	U	3.4
Endrin	3.4	U	3.4	3.4	U	3.4	17	UD	17	3.4	U	3.4
Endrin aldehyde	3.4	U	3.4	3.4	U	3.4	2.6	JD	17	3.4	U	3.4
Endrin ketone	3.4	U	3.4	3.4	U	3.4	1.9	JD	17	3.4	U	3.4
Gamma-BHC (Lindane)	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
gamma-Chlordane	1.7	U	1.7	1.7	U	1.7	2.4	ID	8.4	1.7	U	1.7
Heptachlor	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Heptachlor epoxide	1.7	U	1.7	1.7	U	1.7	8.4	UD	8.4	1.7	U	1.7
Methoxychlor	17	U	17	17	U	17	84	UD	84	17	U	17
Toxaphene	170	UJ	170	170	UJ	170	840	UJD	840	170	UJ	170
Semivolatile Organic Analytes												
1,2,4-Trichlorobenzene	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
1,2-Dichlorobenzene	340	U	340	340	U	340	670	UD	670	340	U	340
1,3-Dichlorobenzene	340	U	340	340	U	340	670	UD	670	340	U	340
1,4-Dichlorobenzene	340	U	340	340	U	340	670	UD	670	340	U	340
2,4,5-Trichlorophenol	840	U	840	840	U	840	1700	UD	1700	840	U	840
2,4,6-Trichlorophenol	340	U	340	340	U	340	670	UD	670	340	U	340
2,4-Dichlorophenol	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
2,4-Dimethylphenol	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
2,4-Dinitrophenol	840	U	840	840	U	840	1700	UD	1700	840	U	840
2,4-Dinitrotoluene	340	U	340	340	U	340	670	UD	670	340	U	340
2,6-Dinitrotoluene	340	U	340	340	U	340	670	UD	670	340	U	340
2-Chloronaphthalene	340	U	340	340	U	340	670	UD	670	340	U	340
2-Chlorophenol	340	U	340	340	U	340	670	UD	670	340	U	340
2-Methylnaphthalene	24	J	340	140	J	340	230	DJ	670	74	J	340
2-Methylphenol (cresol, o-)	340	U	340	340	U	340	670	UD	670	340	U	340
2-Nitroaniline	840	U	840	840	U	840	1700	UD	1700	840	U	840
2-Nitrophenol	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340

Attachment	1	Sheet No.	7 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

Attachment 1. 126-B-3 Staging Area Verification Sampling Results.

Constituent	J03WF5 Sample Location 7 Sample Date 8/19/05			J03WF6 Sample Location 8 Sample Date 8/9/05			J03WF7 Sample Location 9 Sample Date 8/9/05			J03WF8 Sample Location 10 Sample Date 8/9/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analytes (continued)												
3,3'-Dichlorobenzidine	340	U	340	340	U	340	670	UD	670	340	U	340
4-Methylphenol (p-cresol)	340	U	340	340	U	340	670	UD	670	340	U	340
3-Nitroaniline	840	U	840	840	U	840	1700	UD	1700	840	U	840
4,6-Dinitro-2-methylphenol	840	U	840	840	U	840	1700	UD	1700	840	U	840
4-Bromophenyl-phenylether	340	U	340	340	U	340	670	UD	670	340	U	340
4-Chloro-3-methylphenol	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
4-Chloroaniline	340	U	340	340	U	340	670	UD	670	340	U	340
4-Chlorophenyl-phenylether	340	U	340	340	U	340	670	UD	670	340	U	340
4-Nitroaniline	840	UJ	840	840	UJ	840	1700	UDJ	1700	840	UJ	840
4-Nitrophenol	840	U	840	840	U	840	1700	UD	1700	840	U	840
Acenaphthene	340	U	340	340	U	340	670	UD	670	340	U	340
Acenaphthylene	340	U	340	340	U	340	670	UD	670	340	U	340
Anthracene	340	U	340	42	J	340	670	UD	670	340	U	340
Benzo(a)anthracene	340	U	340	120	J	340	57	DJ	670	18	J	340
Benzo(a)pyrene	340	U	340	91	J	340	50	DJ	670	340	U	340
Benzo(b)fluoranthene	340	U	340	76	J	340	42	DJ	670	340	U	340
Benzo(g,h,i)perylene	340	U	340	46	J	340	670	UD	670	340	U	340
Benzo(k)fluoranthene	340	U	340	85	J	340	53	DJ	670	340	U	340
Bis(2-chloro-1-methylethyl)ether	340	U	340	340	U	340	670	UD	670	340	U	340
Bis(2-chloroethoxy)methane	340	U	340	340	U	340	670	UD	670	340	U	340
Bis(2-chloroethyl) ether	340	U	340	340	U	340	670	UD	670	340	U	340
Bis(2-ethylhexyl) phthalate	660	U	660	660	U	660	660	U	660	660	U	660
Butylbenzylphthalate	340	U	340	340	U	340	670	UD	670	340	U	340
Carbazole	340	UJ	340	25	J	340	670	UDJ	670	340	UJ	340
Chrysene	340	U	340	140	J	340	77	DJ	670	24	J	340
Dibenz(a,h)anthracene	340	U	340	17	J	340	670	UD	670	340	U	340
Dibenzofuran	340	U	340	41	J	340	60	DJ	670	27	J	340
Diethylphthalate	340	U	340	340	U	340	670	UD	670	340	U	340
Dimethylphthalate	340	U	340	340	U	340	670	UD	670	340	U	340
Di-n-butylphthalate	25	J	340	43	J	340	670	UD	670	21	J	340
Di-n-octylphthalate	340	U	340	340	U	340	670	UD	670	340	U	340
Fluoranthene	340	U	340	230	J	340	110	DJ	670	40	J	340
Fluorene	340	U	340	21	J	340	670	UD	670	340	U	340
Hexachlorobenzene	340	U	340	340	U	340	670	UD	670	340	U	340
Hexachlorobutadiene	340	U	340	340	U	340	670	UD	670	340	U	340
Hexachlorocyclopentadiene	340	U	340	340	U	340	670	UD	670	340	U	340
Hexachloroethane	340	U	340	340	U	340	670	UD	670	340	U	340
Indeno(1,2,3-cd)pyrene	340	U	340	42	J	340	670	UD	670	340	U	340
Isophorone	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
Naphthalene	18	J	340	45	J	340	140	DJ	670	35	J	340
Nitrobenzene	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
N-Nitroso-di-n-dipropylamine	340	U	340	340	U	340	670	UD	670	340	U	340
N-Nitrosodiphenylamine	340	UJ	340	340	UJ	340	670	UDJ	670	340	UJ	340
Pentachlorophenol	840	U	840	840	U	840	1700	UD	1700	840	U	840
Phenanthrene	340	U	340	220	J	340	170	DJ	670	62	J	340
Phenol	340	U	340	340	U	340	670	UD	670	340	U	340
Pyrene	340	U	340	290	J	340	150	DJ	670	42	J	340

Attachment	1	Sheet No.	8 of 8
Originator	J. M. Capron	Date	12/06/05
Checked	T. M. Blakley	Date	
Calc. No.	0100B-CA-V0267	Rev. No.	0

CALCULATION COVER SHEET

Project Title:	100-B/C Area Field Remediation	**Job No.**	14655
Area	100-B/C		
Discipline	Environmental	***Calc. No.**	0100B-CA-V0279
Subject	126-B-3 Staging Area (Phase II) Cleanup Verification 95% UCL Calculations		
Computer Program	Excel	**Program No.**	Excel 2003

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

Committed Calculation ☒ **Preliminary** ☐ **Superseded** ☐ **Voided** ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 5 Total = 6	5/16/06 J. M. Capron	5/17/06 T. M. Blakley	5/18/06 L. M. Dittmer	5-18-06 D. N. Strom	5-18-06

SUMMARY OF REVISIONS

WCH-DE-018 (4/14/06) * Obtain Calc No. from R&DC and Form from Intranet

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron Date 05/16/06 Calc. No. 0100B-CA-V0279 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 5/17/06
Subject 126-B-3 Staging Area (Phase II) Cleanup Verification 95% UCL Calculations Sheet No. 1 of 5

Summary

Purpose:
Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for additional remediation at the eastern staging pile footprint and for initial hexavalent chromium results at the western staging pile footprint of the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) 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) Remedial action goals (RAGs) are taken from DOE-RL (2005b) and Ecology (2005).
2) DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
3) DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 5, 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, 2005, *Cleanup Levels and Risk Calculations (CLARC) Database*, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
7) EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-94/013. 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 2005b). Use data from attached worksheets to perform the 95% UCL calculation for hexavalent chromium, the WAC 173-340-740(7)(e) 3-part test, and the RPD calculations for each primary-duplicate sample pair, as required. 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 data from soil verification samples from the subject waste site. Following elevated detections of hexavalent chromium at the eastern staging pile footprint during initial (Phase I) remediation verification sampling, additional excavation and sampling (Phase II) was performed at this location. The Phase I verification hexavalent chromium results from the western staging pile footprint were used to evaluate that location separately from the eastern staging pile footprint with regards to hexavalent chromium. 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 2005b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron Date 05/16/06 Calc. No. 0100B-CA-V0279 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 5/17/06
Subject 126-B-3 Staging Area (Phase II) Cleanup Verification 95% UCL Calculations Sheet No. 12 of 5

Summary (continued)

Methodology:

For nonradioactive analytes with ≤50% of the data below detection limits and all radionuclide analytes, 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, the maximum detected value for the data set is used instead of the 95% UCL.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). For radionuclide data, calculation of the statistics was done on the reported value. In cases where the laboratory does not report a value below the minimal 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 ($n < 10$) and all radionuclide data sets, the calculations are performed assuming nonparametric distribution, so no tests for distribution are performed. For nonradionuclide data sets of ten or greater, distributional testing and calculation of the 95% UCL is done using Ecology's MTCAStat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2005b) 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 WAC 173-340-740(7)(e) 3-part test is not performed for data sets where the statistical value defaults to the maximum value, as direct comparison of the maximum value against site RAGs (within the RSVP) is performed.

The RPD is calculated when both the primary value and the duplicate 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, listed in Table II-1 of the SAP (DOE-RL 2005a). 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. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for regulatory split data), further investigation regarding the usability of the data is performed. No split samples were collected for cleanup verification of the subject site. Additional discussion is provided in the data quality assessment section of the applicable RSVP, as necessary.

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron Date 05/16/06 Calc. No. 0100B-CA-V0279 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 5/17/06
Subject 126-B-3 Staging Area (Phase II) Cleanup Verification 95% UCL Calculations Sheet No. 3 of 5

Summary (continued)

Results:
The results presented in the summary tables that follow are for use in risk analysis and the RSVP for this site.

Results Summary - Eastern Staging Pile Footprint (Phase II)			
Analyte	**95% UCL[a]**	**Maximum[b]**	**Units**
Hexavalent Chromium		0.49	mg/kg
WAC 173-340-740(7)(e) Evaluation			
Direct comparison of the maximum detected value against RAGs (within the RSVP) will be used as the compliance basis.			

[a]For nonradionuclides, where ≤ 50% of a data set is censored (below detection limits), the 95% UCL value is used for a given analyte.
[b]Where > 50% of a data set is censored, the statistical value defaults to the maximum detected value in the data set.
RAG = remedial action goal
RSVP = remaining sites verification package
UCL = upper confidence level
WAC = *Washington Adminstrative Code*

Results Summary - Western Staging Pile Footprint (Phase I)			
Analyte	**95% UCL[a]**	**Maximum[b]**	**Units**
Hexavalent Chromium	0.32		mg/kg
WAC 173-340-740(7)(e) Evaluation			
WAC 173-340 3-Part Test for most stringent RAG:			
95% UCL > Cleanup Limit?	NO	The data set meets the 3-part	
> 10% above Cleanup Limit?	NO	test criteria when compared to	
Any sample > 2x Cleanup Limit?	NO	the most stringent cleanup limit.	

[a]For nonradionuclides, where ≤ 50% of a data set is censored (below detection limits), the 95% UCL value is used for a given analyte.
[b]Where > 50% of a data set is censored, the statistical value defaults to the maximum detected value in the data set.
RAG = remedial action goal
UCL = upper confidence level
WAC = *Washington Adminstrative Code*

Relative Percent Difference Results
Relative percent difference analysis was not required for any primary-duplicate sample pairs.

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron Date 05/16/06 Calc. No. 0100B-CA-V0279 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 6/7/06
Subject 126-B-3 Staging Area (Phase II) Cleanup Verification 95% UCL Calculations Sheet No. 4 of 5

126-B-3 East Staging Pile Footprint Phase II Sample Data

Sampling Area	HEIS Number	Sample Date	Hexavalent Chromium mg/kg	Q	PQL
5	J117L5	2/14/2006	0.30		0.21
Duplicate of J117L5	J117M2	2/14/2006	0.21		0.21
1	J117L1	2/14/2006	0.49		0.21
2	J117L2	2/14/2006	0.21	U	0.21
3	J117L3	2/14/2006	0.21	U	0.21
4	J117L4	2/14/2006	0.21	U	0.21
6	J117L6	2/14/2006	0.22		0.20
7	J117L7	2/14/2006	0.32		0.22
8	J117L8	2/14/2006	0.20	U	0.20
9	J117L9	2/14/2006	0.20	U	0.20
10	J117M0	2/14/2006	0.22	U	0.22
11	J117M1	2/14/2006	0.24		0.20

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Hexavalent Chromium mg/kg		
5	J117L5/ J117M2	2/14/2006	0.26		
1	J117L1	2/14/2006	0.49		
2	J117L2	2/14/2006	0.11		
3	J117L3	2/14/2006	0.11		
4	J117L4	2/14/2006	0.11		
6	J117L6	2/14/2006	0.22		
7	J117L7	2/14/2006	0.32		
8	J117L8	2/14/2006	0.10		
9	J117L9	2/14/2006	0.10		
10	J117M0	2/14/2006	0.11		
11	J117M1	2/14/2006	0.24		

Statistical Computations

	Hexavalent Chromium		
95% UCL value based on	Data set >50% censored. 95% UCL value not calculated.		
N	11		
% < Detection limit	55%		
Mean	0.20		
Standard deviation	0.13		
95% UCL on mean	--		
Maximum value	0.49		
Statistical value	0.49		
Most Stringent Cleanup Limit for nonradionuclide and RAG type	2	River Protection	
WAC 173-340 3-PART Test	Direct comparison of the maximum detected value against RAGs will be used as the compliance basis.		

Split-Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Hexavalent Chromium mg/kg	Q	PQL
5	J117L5	2/14/2006	0.30		0.21
Duplicate of J117L5	J117M2	2/14/2006	0.21		0.21
TDL			0.5		
Duplicate Analysis	Both > PQL/MDA?		No-Stop (acceptable)		
	Both > 5xTDL?				
	RPD				

-- = not calculated
HEIS = Hanford Environmental Information System
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RPD = relative percent difference
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = *Washington Administrative Code*

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron Date 05/16/06 Calc. No. 0100B-CA-V0279 Rev. No. 0
Project 100-B/C Area Field Remediation Job No. 14655 Checked T. M. Blakley Date 5/17/06
Subject 126-B-3 Staging Area (Phase II) Cleanup Verification 95% UCL Calculations Sheet No. 5 of 5

126-B-3 West Staging Pile Footprint Phase I Sample Data

Sampling Area	HEIS Number	Sample Date	Hexavalent Chromium mg/kg	Q	PQL
1	J03WD8	8/9/2005	0.20	U	0.20
Duplicate of J03WD8	J03WD9	8/9/2005	0.29		0.20
2	J03WF0	8/9/2005	0.26		0.20
3	J03WF1	8/9/2005	0.21		0.20
4	J03WF2	8/9/2005	0.23		0.20
5	J03WF3	8/9/2005	0.31		0.20
6	J03WF4	8/9/2005	0.22		0.20
7	J03WF5	8/9/2005	0.43		0.20

Statistical Computation Input Data

Sampling Area	HEIS Number	Sample Date	Hexavalent Chromium mg/kg		
1	J03WD8/ J03WD9	8/9/2005	0.20		
2	J03WF0	8/9/2005	0.26		
3	J03WF1	8/9/2005	0.21		
4	J03WF2	8/9/2005	0.23		
5	J03WF3	8/9/2005	0.31		
6	J03WF4	8/9/2005	0.22		
7	J03WF5	8/9/2005	0.43		

Statistical Computations

	Hexavalent Chromium		
95% UCL value based on	Small data set. Use nonparametric z-stat.		
N	7		
% < Detection limit	0%		
Mean	0.27		
Standard deviation	0.08		
Z-statistic	1.645		
95% UCL on mean	0.32		
Maximum value	0.43		
Statistical value	0.32		
Most Stringent Cleanup Limit for nonradionuclide and RAG type	2	River Protection	
WAC 173-340 3-PART TEST			
95% UCL > Cleanup Limit?	NO		
> 10% above Cleanup Limit?	NO		
Any sample > 2X Cleanup Limit?	NO		
WAC 173-340 Compliance? YES	The data set meets the 3-part test criteria when compared to the most stringent cleanup limit.		

Split-Duplicate Analysis

Sampling Area	HEIS Number	Sample Date	Hexavalent Chromium mg/kg	Q	PQL
1	J03WD8	8/9/2005	0.20	U	0.20
Duplicate of J03WD8	J03WD9	8/9/2005	0.29		0.20
TDL			0.5		
Duplicate Analysis	Both > PQL/MDA?		No-Stop (acceptable)		
	Both > 5xTDL?				
	RPD				

HEIS = Hanford Environmental Information System
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
RPD = relative percent difference
TDL = target detection limit
U = undetected
UCL = upper confidence limit
WAC = *Washington Administrative Code*

APPENDIX D

SAMPLING RESULTS FOR THE EASTERN STAGING PILE FOOTPRINT SUSPECT DRYWELL

Table D-1. 126-B-3 Suspect Drywell Footprint Biased Sample Results.* (3 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Drywell footprint	J11794	2/7/06	0.35	U	0.35	0.049	U	0.049	0.048	U	0.048	0.097	U	0.097	0.16	U	0.16

Sample Location	HEIS Number	Sample Date	Europium-155			Gross Alpha			Gross Beta			Potassium-40			Radium-226		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Drywell footprint	J11794	2/7/06	0.14	U	0.14	8.69		3.6	20.9		5.6	14.7		0.41	0.591		0.078

Sample Location	HEIS Number	Sample Date	Radium-228			Silver-108m			Thorium-228			Thorium-232			Uranium-235		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Drywell footprint	J11794	2/7/06	1.01		0.19	0.029	U	0.029	0.802		0.049	1.01		0.19	0.20	U	0.20

Sample Location	HEIS Number	Sample Date	Uranium-238		
			pCi/g	Q	MDA
Drywell footprint	J11794	2/7/06	5.1	U	5.1

*Statistical verification data and associated quality control data for the 126-B-3 waste site are provided in Appendix C.

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

B = blank contamination (organic constituents)

C = blank contamination (inorganic constituents)

D = dilution

HEIS = Hanford Environmental Information System

J = estimated

MDA = minimum detectable activity

PQL = practical quantitation limit

Q = qualifier

U = undetected

Table D-1. 126-B-3 Suspect Drywell Footprint Biased Sample Results. (3 Pages)

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Drywell footprint	J11794	2/7/06	10100		5.9	1.3	U	1.3	5.9		1.1	96.3		0.06	0.98		0.03

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Drywell footprint	J11794	2/7/06	3.3		0.87	0.36		0.23	9590	C	3.8	13.8		0.52	12.9		0.39

Sample Location	HEIS Number	Sample Date	Copper			Hexavalent Chromium			Iron			Lead			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Drywell footprint	J11794	2/7/06	46.0		0.39	0.23	U	0.23	27500		10.4	18.6		1.0	7230		4.4

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Drywell footprint	J11794	2/7/06	467		0.06	0.09		0.02	0.42	UC	0.42	19.3		0.42	1640		17.9

Sample Location	HEIS Number	Sample Date	Selenium			Silicon			Silver			Sodium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Drywell footprint	J11794	2/7/06	1.2	U	1.2	774		2.6	0.45	U	0.45	272	C	0.55	57.1		0.29

Sample Location	HEIS Number	Sample Date	Zinc			Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL	mg/kg	Q	PQL
Drywell footprint	J11794	2/7/06	220		0.16	150	U	150

Table D-1. 126-B-3 Suspect Drywell Footprint Biased Sample Results. (3 Pages)

Constituent	J11794 Drywell footprint Sample Date 2/7/06		
	µg/kg	Q	PQL
Polychlorinated Biphenyls			
Aroclor-1016	15	U	15
Aroclor-1221	15	U	15
Aroclor-1232	15	U	15
Aroclor-1242	15	U	15
Aroclor-1248	15	U	15
Aroclor-1254	15	U	15
Aroclor-1260	15	U	15
Pesticides			
Aldrin	1.5	UD	1.5
alpha-BHC	1.5	UD	1.5
alpha-Chlordane	1.5	UD	1.5
beta-BHC	2.4	D	1.5
delta-BHC	1.5	UD	1.5
Dichlorodiphenyldichloroethane	1.5	UD	1.5
Dichlorodiphenyldichloroethylene	1.5	UD	1.5
Dichlorodiphenyltrichloroethane	1.6	D	1.5
Dieldrin	1.5	UD	1.5
Endosulfan I	1.5	UD	1.5
Endosulfan II	1.5	UD	1.5
Endosulfan sulfate	1.5	UD	1.5
Endrin	1.5	UD	1.5
Endrin aldehyde	1.5	UD	1.5
Endrin ketone	1.5	UD	1.5
gamma-BHC (Lindane)	1.5	UD	1.5
gamma-Chlordane	1.5	UD	1.5
Heptachlor	1.5	UD	1.5
Heptachlor epoxide	1.5	UD	1.5
Methoxychlor	1.5	UD	1.5
Toxaphene	15	UD	15
Semivolatile Organic Compounds			
1,2,4-Trichlorobenzene	380	U	380
1,2-Dichlorobenzene	380	U	380
1,3-Dichlorobenzene	380	U	380
1,4-Dichlorobenzene	380	U	380
2,4,5-Trichlorophenol	940	U	940
2,4,6-Trichlorophenol	380	U	380
2,4-Dichlorophenol	380	U	380
2,4-Dimethylphenol	380	U	380
2,4-Dinitrophenol	940	U	940
2,4-Dinitrotoluene	380	U	380
2,6-Dinitrotoluene	380	U	380
2-Chloronaphthalene	380	U	380
2-Chlorophenol	380	U	380
2-Methylnaphthalene	76	J	380
2-Methylphenol (cresol, o-)	380	U	380
2-Nitroaniline	940	U	940
2-Nitrophenol	380	U	380

Constituent	J11794 French drain footprint Sample Date 2/7/06		
	µg/kg	Q	PQL
Semivolatile Organic Compounds (continued)			
3,3'-Dichlorobenzidine	380	U	380
3-Nitroaniline	940	U	940
4,6-Dinitro-2-methylphenol	940	U	940
4-Bromophenylphenyl ether	380	U	380
4-Chloro-3-methylphenol	380	U	380
4-Chloroaniline	380	U	380
4-Chlorophenylphenyl ether	380	U	380
4-Methylphenol (cresol, p-)	380	U	380
4-Nitroaniline	940	U	940
4-Nitrophenol	940	U	940
Acenaphthene	380	U	380
Acenaphthylene	380	U	380
Anthracene	380	U	380
Benzo(a)anthracene	380	U	380
Benzo(a)pyrene	380	U	380
Benzo(b)fluoranthene	380	U	380
Benzo(ghi)perylene	380	U	380
Benzo(k)fluoranthene	380	U	380
Bis(2-chloro-1-methylethyl)ether	380	U	380
Bis(2-Chloroethoxy)methane	380	U	380
Bis(2-chloroethyl) ether	380	U	380
Bis(2-ethylhexyl) phthalate	92	JB	380
Butylbenzylphthalate	380	U	380
Carbazole	380	U	380
Chrysene	380	U	380
Di-n-butylphthalate	25	J	380
Di-n-octylphthalate	380	U	380
Dibenz[a,h]anthracene	380	U	380
Dibenzofuran	380	U	380
Diethylphthalate	380	U	380
Dimethyl phthalate	380	U	380
Fluoranthene	380	U	380
Fluorene	380	U	380
Hexachlorobenzene	380	U	380
Hexachlorobutadiene	380	U	380
Hexachlorocyclopentadiene	380	U	380
Hexachloroethane	380	U	380
Indeno(1,2,3-cd)pyrene	380	U	380
Isophorone	380	U	380
N-Nitroso-di-n-dipropylamine	380	U	380
N-Nitrosodiphenylamine	380	U	380
Naphthalene	44	J	380
Nitrobenzene	380	U	380
Pentachlorophenol	940	U	940
Phenanthrene	34	J	380
Phenol	380	U	380
Pyrene	22	J	380

APPENDIX E

CALCULATION OF HAZARD QUOTIENTS AND EXCESS CARCINOGENIC RISK VALUES

CALCULATION COVER SHEET

Project Title 100-B/C Area Field Remediation Project **Job No.** 14655
Area 100-B/C
Discipline Environmental *Calc. No. 0100B-CA-V0261
Subject 126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculations
Computer Program Excel **Program No.** Excel 2003

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

Committed Calculation ☒ **Preliminary** ☐ **Superseded** ☐ **Voided** ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 3 Total = 4	J. M. Capron *Approved 8/23/05*	T. M. Blakley *Approved 8/23/05*	T. M. Blakley for L. M. Dittmer *Approved 8/23/05*	D. N. Strom *Approved 8/25/05*	*8/25/05*
1	Cover = 1 Summary = 3 Total = 4	J. M. Capron 6/21/06	T. M. Blakley 6/22/06	L. M. Dittmer 6/22/06	D. N. Strom 7-3-06	

SUMMARY OF REVISION

1	Calculation revised to correct value for benzo(a)pyrene and to remove erroneous diethylphthalate value. Calculation text was updated incidentally to reflect updated calculation description and references. Entire calculation was replaced due to changed header; therefore, no revision bars are included.

WCH-DE-018 (4/14/06) * Obtain Calc No. from R&DC and Form from Intranet

Washington Closure Hanford CALCULATION SHEET

Originator:	J. M. Capron	Date:	06/21/06	Calc. No.:	0100B-CA-V0261	Rev.:	1
Project:	100-D/DR Area Remaining Sites	Job No:	14655	Checked:	T. M. Blakley	Date:	6/22/06
Subject:	126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	1 of 3

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and excess carcinogenic risk values for the 126-B-3 excavated area remedial action completion verification sampling results. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2005), 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, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas,* DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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

3) WCH, 2006, Waste Site Reclassification Form 2005-028, and Attachment *Remaining Sites Verification Package for the 126-B-3 Waste Site, 184-B Coal Pit Dumping Area*, Washington Closure Hanford, Richland, Washington.

SOLUTION:

1) Calculate an HQ for each noncarcinogenic constituent detected above background and compare to the individual HQ of <1.0 (DOE-RL 2005).

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

3) Calculate an excess cancer risk value for each carcinogenic constituent detected above background and compare to the individual excess cancer risk criterion of $<1 \times 10^{-6}$ (DOE-RL 2005).

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

METHODOLOGY:

Hazard quotient and carcinogenic risk calculations were computed for the 126-B-3 excavated area using the statistical data or maximum values, as appropriate, from WCH (2006). Of the contaminants of potential concern (COPCs) for the site, boron and molybdenum require the HQ and risk calculations because these analytes were detected and Washington State or Hanford Site background values are not available. Copper is included because it was quantified at a concentration above its Hanford Site background value. Aroclor-1260 and multiple semivolatile organic compounds (as listed in Table 1) are

Washington Closure Hanford CALCULATION SHEET

Originator:	J. M. Capron	Date:	06/21/06	Calc. No.:	0100B-CA-V0261	Rev.:	1
Project:	100-D/DR Area Remaining Sites	Job No:	14655	Checked:	T. M. Blakley	Date:	6/22/06
Subject:	126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	2 of 3

included because they were detected by laboratory analysis and cannot be attributed to natural occurrence. All other site nonradionuclide COPCs were detected below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the statistical value for boron is 4.9 mg/kg, divided by the noncarcinogenic RAG value of 16,000 mg/kg (boron is identified as a noncarcinogen in WAC 173-340-740[3]), is 3.1×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculations are completed for the appropriate analytes, the cumulative HQ is obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation.) The sum of the HQ values is 1.4×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess carcinogenic risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6}. For example, the maximum value for aroclor-1260 is 0.017 mg/kg; divided by 0.5 mg/kg and multiplied as indicated is 3.4×10^{-8}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess carcinogenic risk is obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual values prior to rounding are used for this calculation.) The sum of the excess carcinogenic risk values is 3.2×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

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

Table 1 shows the results of the calculations for the 126-B-3 excavated area.

Washington Closure Hanford		CALCULATION SHEET					
Originator:	J. M. Capron	Date:	06/21/06	Calc. No.:	0100B-CA-V0261	Rev.:	1
Project:	100-D/DR Area Remaining Sites	Job No:	14655	Checked:	T. M. Blakley	Date:	6/22/06
Subject:	126-B-3 (Excavated Area) Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	3 of 3

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 126-B-3 Waste Site (Excavated Area).

Contaminants of Concern/ Contaminants of Potential Concern[a]	Statistical or Maximum Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	4.9	16,000	3.1E-04	--	--
Copper	23.4	2,960	7.9E-03	--	--
Molybdenum	1.4	400	3.5E-03	--	--
Semivolatiles					
Acenaphthene	0.055	4,800	1.1E-05	--	--
Anthracene	0.15	24,000	6.3E-06	--	--
Benzo(a)anthracene	0.35	--	--	1.37	2.6E-07
Benzo(a)pyrene	0.27	--	--	0.33[c]	8.2E-07
Benzo(b)fluoranthene	0.19	--	--	1.37	1.4E-07
Benzo(k)fluoranthene	0.24	--	--	13.7	1.8E-08
Benzo(g,h,i)perylene[d]	0.17	2,400	7.1E-05	--	--
Carbazole	0.075	--	--	50	1.5E-09
Chrysene	0.37	--	--	137	2.7E-09
Dibenzo(a,h)anthracene	0.088	--	--	0.33[c]	2.7E-07
Dibenzofuran	0.099	160	6.2E-04	--	--
Fluoranthene	0.73	3,200	2.3E-04	--	--
Fluorene	0.071	3,200	2.2E-05	--	--
Indeno(1,2,3-cd) pyrene	0.16	--	--	1.37	1.2E-07
Methylnapthalene; 2-	0.39	320	1.2E-03	--	--
Naphthalene	0.12	1,600	7.5E-05	--	--
Nitrosodiphenylamine;N-	0.10	--	--	204	4.9E-10
Phenanthrene[d]	0.62	24,000	2.6E-05	--	--
Pyrene	0.70	2,400	2.9E-04	--	--
Trichlorobenzene; 1,2,4-	0.052	800	6.5E-05	--	--
Polychlorinated Biphenyls					
Aroclor-1260	0.017	--	--	0.5	3.4E-08
Totals					
Cumulative Hazard Quotient:			**1.4E-02**		
Cumulative Excess Cancer Risk:					**3.2E-06**

Notes:
RAG = remedial action goal
-- = not applicable
[a] = From BHI (2005).
[b] = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.
[c] = Total carcinogenic risk calculated using the cleanup level (0.137 mg/kg) instead of the required detection limit (0.33 mg/kg), per WAC 173-340-740(3), Method B, 1996. Individual carcinogenic risk calculated using the required detection limit (0.33 mg/kg).
[d] = Toxicity data for this chemical are not available. RAGs for benzo(g,h,i)perylene and phenanthrene are based on the surrogate chemicals pyrene and anthracene, respectively.

CONCLUSION:

This calculation demonstrates that the excavated area of the 126-B-3 waste site meets the requirements for the hazard quotient and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2005).

CALCULATION COVER SHEET

Project Title 100-B/C Area Field Remediation Project **Job No.** 14655
Area 100-B/C
Discipline Environmental *Calc. No. 0100B-CA-V0280
Subject 126-B-3 Staging Pile Footprint Hazard Quotient and Carcinogenic Risk Calculations
Computer Program Excel **Program No.** Excel 2003

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

Committed Calculation ☒ **Preliminary** ☐ **Superseded** ☐ **Voided** ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 4 Total = 5	J. M. Capron 6/21/06	T. M. Blakley 6/22/06	L. M. Dittmer 6/22/06	D. N. Strom	7-3-06

SUMMARY OF REVISION

WCH-DE-018 (4/14/06) * Obtain Calc No. from R&DC and Form from Intranet

DE01437.03 (12/09/2004)

Washington Closure Hanford CALCULATION SHEET

Originator:	J. M. Capron	Date:	06/21/06	Calc. No.:	0100B-CA-V0280	Rev.:	0
Project:	100-D/DR Area Remaining Sites	Job No:	14655	Checked:	T. M. Blakley	Date:	9/22/06
Subject:	126-B-3 Staging Pile Footprint Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	1 of 4

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and carcinogenic (excess cancer) risk values for the 126-B-3 staging area remedial action completion verification sampling results. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2005), 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, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas,* DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) EPA, 1994, *Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children*, EPA/540/R-93/081, Publication No. 9285.7-15-1, U.S. Environmental Protection Agency, Washington, D.C.

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

4) WCH, 2006, Waste Site Reclassification Form 2005-028, and Attachment *Remaining Sites Verification Package for the 126-B-3 Waste Site, 184-B Coal Pit Dumping Area*, Washington Closure Hanford, Richland, Washington.

SOLUTION:

1) Calculate an HQ for each noncarcinogenic constituent detected above background and compare to the individual HQ of <1.0 (DOE-RL 2005).

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

3) Calculate an excess cancer risk value for each carcinogenic constituent detected above background and compare to the individual excess cancer risk criterion of $<1 \times 10^{-6}$ (DOE-RL 2005).

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

METHODOLOGY:

Hazard quotient and carcinogenic risk calculations were computed for the 126-B-3 staging pile footprint using the statistical and biased verification data from WCH (2006). Following site remediation and

Washington Closure Hanford CALCULATION SHEET

Originator:	J. M. Capron JMC	Date:	06/21/06	Calc. No.:	0100B-CA-V0280	Rev.:	0
Project:	100-D/DR Area Remaining Sites	Job No:	14655	Checked:	T. M. Blakley TMB	Date:	6/22/06
Subject:	126-B-3 Staging Pile Footprint Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	2 of 4

removal of staged waste, chromium-contaminated soil was identified in the northern portion of the western staging area. This contamination is unrelated to waste staging or historic disposal activities at the 126-B-3 waste site; the area has been removed from consideration within 126-B-3 verification sampling and designated as the 100-B-27 waste site. Initial verification sampling of the 126-B-3 staging area indicated hexavalent chromium concentrations exceeding remedial action goals in the eastern staging pile footprint. Additional remediation was performed in the area and a new cleanup verification data set collected for hexavalent chromium only, following the assumption that residual concentrations of other contaminants of potential concern were less than or equivalent to those detected during the first verification sampling event. During additional material removal, a suspect drywell was also discovered in the eastern staging pile footprint and removed. A biased sample was collected in the drywell footprint. Risk values for the entire staging pile footprint were conservatively calculated using the higher of the staging pile footprint statistical value and the suspect drywell footprint biased sample result for each constituent.

Of the contaminants of potential concern (COPCs) for the site, boron requires the HQ and risk calculations because this analyte was detected and a Washington State or Hanford Site background value is not available. Copper, lead, nickel, and zinc are included because they were quantified at a concentration above their respective Washington State or Hanford Site background values. Hexavalent chromium, aroclor-1260, and multiple semivolatile organic compounds and pesticides (as listed in Table 1) are included because they were detected by laboratory analysis and cannot be attributed to natural occurrence. All other site nonradionuclide COPCs were detected below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the statistical value for boron is 3.4 mg/kg, divided by the noncarcinogenic RAG value of 16,000 mg/kg (boron is identified as a noncarcinogen in WAC 173-340-740[3]), is 2.1×10^{-4}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculations are completed for the appropriate analytes, the cumulative HQ is 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 9.3×10^{-2}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6}. For example, the statistical value for aroclor-1260 is 0.053 mg/kg; divided by 0.5 mg/kg and multiplied as indicated is 1.1×10^{-7}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess carcinogenic risk is obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual values prior to rounding are used for this calculation.) The sum of the excess carcinogenic risk values is 1.3×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

Washington Closure Hanford CALCULATION SHEET

Originator:	J. M. Capron JMC	Date:	06/21/06	Calc. No.:	0100B-CA-V0280	Rev.:	0
Project:	100-D/DR Area Remaining Sites	Job No:	14655	Checked:	T. M. Blakley JMB	Date:	6/22/06
Subject:	126-B-3 Staging Pile Footprint Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	3 of 4

RESULTS:

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

Table 1 shows the results of the calculations for the 126-B-3 staging pile footprint.

CONCLUSION:

This calculation demonstrates that the 126-B-3 staging pile footprint meets the requirements for the hazard quotient and excess carcinogenic risk as identified in the RDR/RAWP (DOE-RL 2005).

Washington Closure Hanford CALCULATION SHEET

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Table 1. Hazard Quotient and Excess Cancer Risk Results for the 126-B-3 Staging Pile Footprint.

Contaminants of Potential Concern	Maximum or Statistical Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	3.4	16,000	2.1E-04	--	--
Chromium, hexavalent[c]	0.49	240	2.0E-03	2.1	2.3E-07
Copper	46.0	2,960	1.6E-02	--	--
Lead[d]	18.6	353	5.3E-02	--	--
Nickel	19.3	1,600	1.2E-02	--	--
Zinc	220	24,000	9.2E-03	--	--
Semivolatiles					
Anthracene	0.042	24,000	1.8E-06	--	--
Benzo(a)anthracene	0.12	--	--	1.37	8.8E-08
Benzo(a)pyrene	0.091	--	--	0.137	6.6E-07
Benzo(b)fluoranthene	0.076	--	--	1.37	5.5E-08
Benzo(k)fluoranthene	0.085	--	--	13.7	6.2E-09
Benzo(g,h,i)perylene[e]	0.046	2,400	1.9E-05	--	--
Bis(2-ethylhexyl) phthalate	0.092	1,600	5.8E-05	71.4	1.3E-09
Carbazole	0.025	--	--	50	5.0E-10
Chrysene	0.14	--	--	137	1.0E-09
Dibenzo(a,h)anthracene	0.017	--	--	0.137	1.2E-07
Dibenzofuran	0.06	160	3.8E-04	--	--
Di-n-butylphthalate	0.11	8,000	1.4E-05	--	--
Fluoranthene	0.23	3,200	7.2E-05	--	--
Fluorene	0.021	3,200	6.6E-06	--	--
Indeno(1,2,3-cd) pyrene	0.042	--	--	1.37	3.1E-08
Methylnaphthalene; 2-	0.17	320	5.3E-04	--	--
Naphthalene	0.14	1,600	8.8E-05	--	--
Phenanthrene[e]	0.17	24,000	7.1E-06	--	--
Pyrene	0.29	2,400	1.2E-04	--	--
Pesticides					
BHC, beta-	0.0090	--	--	0.556	1.6E-08
Chlordane (alpha and gamma)	0.0024	40	6.0E-05	2.86	8.4E-10
DDT, 4,4'-	0.0062	40	1.6E-04	2.94	2.1E-09
Endosulfan (I, II, sulfate)	0.0029	480	6.0E-06	--	--
Endrin (and ketone, aldehyde)	0.0045	24	1.9E-04	--	--
Polychlorinated Biphenyls					
Aroclor-1260	0.053	--	--	0.5	1.1E-07
Totals					
Cumulative Hazard Quotient:			**9.3E-02**		
Cumulative Excess Cancer Risk:					**1.3E-06**

Notes:
RAG = remedial action goal
-- = not applicable
[a] = From WCH 2006.
[b] = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.
[c] = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.
[d] = Value for the noncarcinogen RAG obtained from EPA (1994).
[e] = Toxicity data for this chemical are not available. RAGs for benzo(g,h,i)perylene and phenanthrene are based on the surrogate chemicals pyrene and anthracene, respectively.