Date Submitted: 11/20/07 Originator: L. M. Dittmer Phone: 372-9227	**WASTE SITE RECLASSIFICATION FORM** Operable Unit(s): 100-FR-1 Waste Site Code: 100-F-26:10 Type of Reclassification Action: Closed Out ☐ Interim Closed Out ☒ No Action ☐ RCRA Postclosure ☐ Rejected ☐ Consolidated ☐	Control Number: 2007-028

This form documents agreement among parties listed authorizing classification of the subject unit as Closed Out, Interim Closed Out, No Action, RCRA Postclosure, Rejected, or Consolidated. This form also authorizes backfill of the waste management unit, if appropriate, for Closed Out and Interim Closed Out units. Final removal from the NPL of No Action and Closed Out waste management units will occur at a future date.

Description of current waste site condition:

The 100-F-26:10 waste site includes sanitary sewer lines that serviced the former 182-F, 183-F, and 151-F Buildings. Confirmatory 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 using available process information and confirmatory sample data, (2) remediating the site, (3) demonstrating through verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification to Interim Closed Out.

Basis for reclassification:

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 Remaining Sites ROD. The results of verification sampling show that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-F-26:10, 1607-F3 Sanitary Sewer Pipelines (182-F, 183-F, and 151-F Sanitary Sewer Lines)* (attached).

Waste Site Controls:
Engineered Controls: Yes ☐ No ☒ Institutional Controls: Yes ☐ No ☒ O&M requirements: Yes ☐ No ☒
If any of the Waste Site Controls are checked Yes specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents.

S. L. Charboneau DOE Federal Project Director (printed)	Signature	12/3/07 Date
N/A Ecology Project Manager (printed)	Signature	Date
R. A. Lobos EPA Project Manager (printed)	Signature	12-3-07 Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-F-26:10, 1607-F3 SANITARY SEWER PIPELINES (182-F, 183-F, AND 151-F SANITARY SEWER LINES)

Attachment to Waste Site Reclassification Form 2007-028

November 2007

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-F-26:10, 1607-F3 SANITARY SEWER PIPELINES (182-F, 183-F, AND 151-F SANITARY SEWER LINES)

EXECUTIVE SUMMARY

The 100-F-26 site includes the underground process and sanitary sewer pipelines associated with the 100-F Area pre-reactor cooling water treatment facilities. For the confirmatory sampling effort, the 100-F-26 site was divided into 16 subsites based on intended use of the pipe (e.g., sanitary sewer or process water), expected sources of contamination, and potential remedial actions. The 100-F-26:10 underground pipeline subsite consists of underground sanitary sewer pipelines associated with the 100-F-26 underground pipelines waste site that serviced the 182-F, 183-F, and 151-F Buildings and discharged to the 1607-F3 septic system.

A portion of the north-south vitrified clay pipeline that serviced the 182-F Pump Station and a portion of the 183-F Water Treatment Plant pipeline were removed during decommissioning of the buildings, leaving two separate sections of pipeline. Confirmatory sampling occurred on November 19 and 22, 2004. The sample design defined two service areas based on the direction of flow in the pipelines and the facilities being serviced by the pipelines. Samples were collected at a test pit in each service area from the contents of the junction boxes and from the soil underneath the junction boxes. Barium, copper, lead, mercury, nickel, total chromium, gamma chlordane, and aroclor-1260 were detected above the soil remedial action goals (RAGs) for protection of groundwater and the Columbia River; zinc was detected above the soil RAG for protection of the Columbia River; and hexavalent chromium exceeded the RAGs for direct exposure and protection of groundwater and the Columbia River. Based on evaluation of the confirmatory sample results, it was determined that remedial action of this pipeline subsite was necessary.

In preparation for the site remediation, two road crossings were excavated, sampled, and immediately backfilled in January 2007. Remedial action at the 100-F-26:10 pipeline site was performed from March 7 through March 12, 2007. The site was excavated between 2.4 m (8 ft) and 4.3 m (14 ft) below grade, resulting in approximately 1,900 bank cubic meters (BCM) (2,500 bank cubic yards [BCY]) of material disposed of at the Environmental Restoration Disposal Facility, including removal of approximately 600 m (1,970 ft) of pipeline. Approximately 4,200 BCM (5,500 BCY) of overburden soil was removed and stockpiled for use as clean backfill.

Verification sampling for the 100-F-26:10 pipeline site was performed in January 2007 and August 2007 (WCH 2007a, 2007b) to collect data to determine if the RAGs had been met. A total of 21 samples were collected (6 related to the road crossings, 10 from the excavation plus 1 duplicate, and 4 from overburden stockpiles). The samples were analyzed by gamma energy analysis, and for pesticides, semivolatile organics, polychlorinated biphenyls, inductively coupled metals, mercury, and hexavalent chromium in accordance with the verification work instruction. A summary of the cleanup evaluation for the soil results against the applicable criteria is presented in Table ES-1. The results of the

verification sampling are used to make reclassification decisions for the 100-F-26:10 waste site in accordance with the TPA-MP-14 (DOE-RL 2007) 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. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

A comparison against ecological risk screening levels has been made for the site contaminants of concern and other constituents. Screening levels were not exceeded for the site constituents, with the exception of barium, boron, lead, manganese, selenium, and vanadium. 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 barium, manganese, and vanadium are below site background levels; lead and selenium are within the range of Hanford Site background levels; and boron concentrations are consistent with those seen elsewhere at the Hanford Site (no established background value is available for boron). A more complete quantitative ecological risk assessment will be presented in the baseline risk assessment for the river corridor portion of the Hanford Site and will be used to support the final closeout decision for this site.

Table ES-1. Summary of Remedial Action Goals for the 100-F-26:10 Waste Site.

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 radionuclide COCs or COPCs were detected in verification samples.	Yes
Direct Exposure Nonradionuclides	Attain individual COC RAGs.	All individual COC concentrations are below the direct exposure criteria.	Yes
Risk Requirements Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	All individual hazard quotients are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotient (1.2×10^{-1}) is <1.	
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	The excess cancer risk values for individual carcinogens are $<1 \times 10^{-6}$.	
	Attain a total excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The total excess cancer risk value (2.0×10^{-6}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single COPC groundwater and river protection RAGs.	No radionuclide COCs or COPCs were detected in verification samples.	Yes
	Attain national primary drinking water regulations:[a] 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.		
	Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide from DOE Order 5400.5.[b]		
	Meet total uranium standard of 21.2 pCi/L.[c]		
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	Residual concentrations of lead, selenium, aroclor-1254, aroclor-1260, benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, and dieldrin are above the soil RAGs for groundwater and/or river protection. However, RESRAD modeling predicts these constituents will not reach groundwater (and, therefore, the Columbia River) within 1,000 years.[d]	Yes

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

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

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

[d] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005), these constituents are not predicted to migrate more than 3 m (10 ft) vertically in 1,000 years (based on the lowest soil-partitioning coefficient distribution [dieldrin] of 25.6 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick.

COC = contaminant of concern
COPC = contaminant of potential concern
MCL = maximum contaminant level
RAG = remedial action goal
RESRAD = RESidual RADioactivity (dose assessment model)

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-F-26:10, 1607-F3 SANITARY SEWER PIPELINES (182-F, 183-F, AND 151-F SANITARY SEWER LINES)

STATEMENT OF PROTECTIVENESS

The 100-F-26:10, 1607-F3 Sanitary Sewer Pipeline subsite sample results demonstrate that the site achieves the remedial action objectives and remedial action goals (RAGs) 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* (commonly called the Remaining Sites Record of Decision [ROD]) (EPA 1999). These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required.

A comparison against ecological risk screening levels has been made for the site contaminants of concern (COCs) and other constituents. Screening levels were not exceeded for the site constituents, with the exception of barium, boron, lead, manganese, selenium, and vanadium. 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 barium, manganese, and vanadium are below site background levels; lead and selenium are within the range of Hanford Site background levels; and boron concentrations are consistent with those seen elsewhere at the Hanford Site (no established background value is available for boron). A more complete quantitative ecological risk assessment will be presented in the baseline risk assessment for the river corridor portion of the Hanford Site and will be used to support the final closeout decision for this site.

GENERAL SITE INFORMATION AND BACKGROUND

The 100-F-26 site includes the underground process and sanitary sewer pipelines associated with the 100-F Area reactor cooling water treatment facilities. For the confirmatory sampling effort, the 100-F-26 site was divided into 16 subsites based on the intended use of the pipe (e.g., sanitary sewer or process water), expected sources of contamination, and potential remedial actions. The 16 subsites are as follows:

- 100-F-26:1 North process sewer collection pipelines
- 100-F-26:2 Process water pipelines to the aquatic biology and strontium gardens
- 100-F-26:3 184-F Powerhouse pipelines
- 100-F-26:4 South process pipelines
- 100-F-26:5 190-F bypass pipelines

- 100-F-26:6 190-F Reservoir pipelines
- 100-F-26:7 Sodium dichromate and sodium silicate pipelines
- 100-F-26:8 1607-F1 sanitary sewer pipelines
- 100-F-26:9 1607-F2 sanitary sewer pipelines
- 100-F-26:10 1607-F3 sanitary sewer pipelines
- 100-F-26:11 1607-F4 sanitary sewer pipelines
- 100-F-26:12 1.8-m (72-in.) main process sewer pipeline
- 100-F-26:13 108-F drain pipelines
- 100-F-26:14 116-F-5 influent pipelines
- 100-F-26:15 Miscellaneous pipelines associated with the 1608-F sump
- 100-F-26:16 Reactor cooling water pipelines.

This remaining sites verification package only addresses areas within the 100-F-26:10 subsite (1607-F3 sanitary sewer pipelines). The 100-F-26:10 subsite consists of vitrified clay pipe (VCP) lines that carried sanitary waste to the 1607-F3 septic tank and drain field. The 1607-F3 septic system serviced the 182-F Pump Station, the 183-F Water Treatment Plant, and the 151-F Substation from 1944 to 1965 (Figure 1). The main service line was 0.20 m (8 in.) in diameter and had smaller 0.15-m (6-in.)-diameter lines extending to the buildings that they serviced. Junction boxes joined each of the smaller VCP lines with the main service line.

A portion of the north-south VCP line that serviced the 182-F Pump Station and a portion of the 183-F Water Treatment Plant VCP line were removed during decommissioning of the buildings, leaving two separate sections of pipeline. The 1607-F3 septic tank, drain field ,and associated contaminated soil were removed in September 2005. Remedial action objectives for the 1607-F3 waste site were met after the additional excavation of contaminated soil in 2006 and are addressed in the remaining sites verification package document (WCH 2007c).

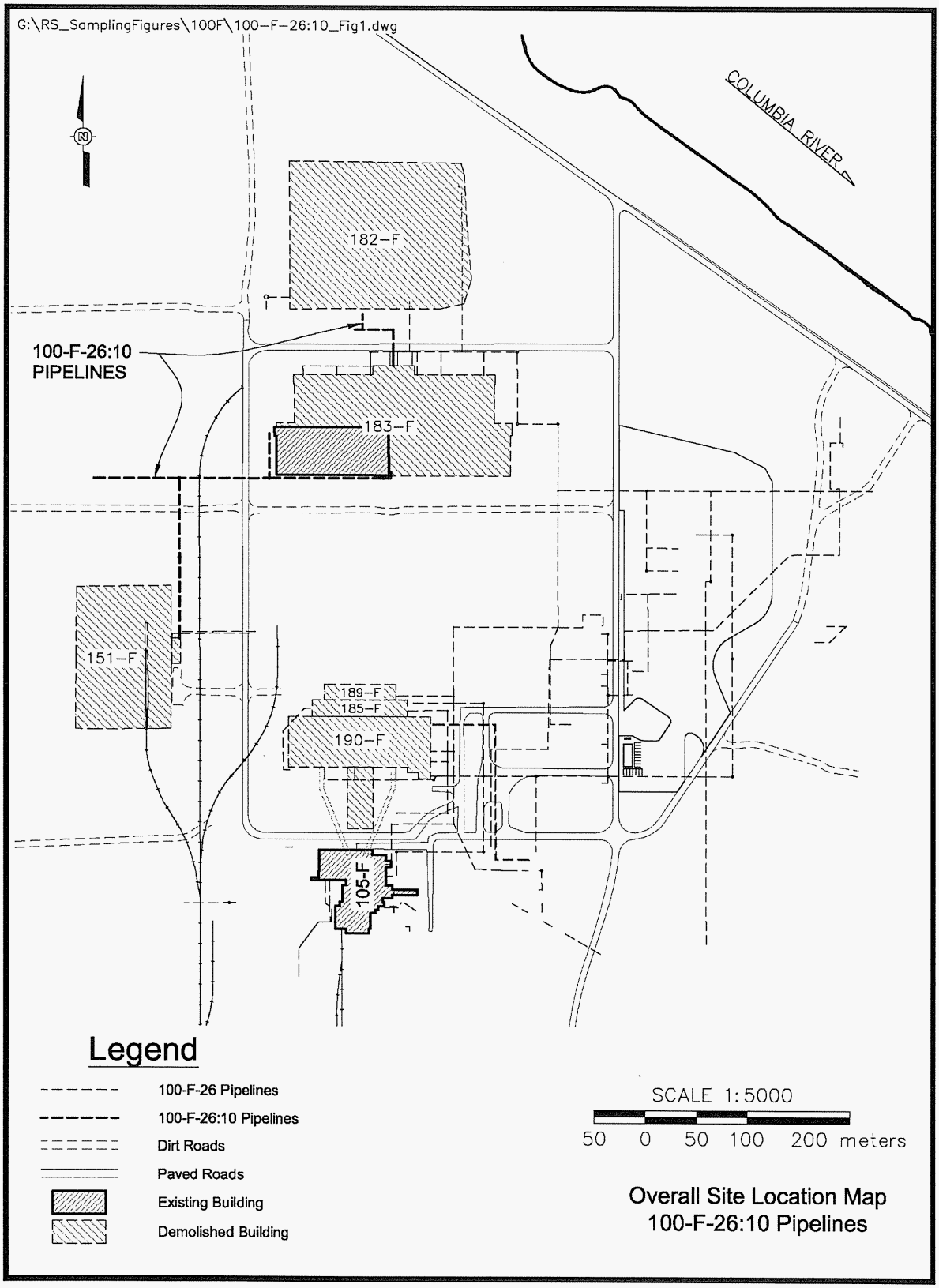
CONFIRMATORY SAMPLING ACTIVITIES

Nonintrusive Investigation Results

The project team conducted a site visit in October 2004. The purpose of the visit was to gather the necessary information to finalize the sampling requirements specified in the work instruction for this site (BHI 2004b) and to provide information to allow for potential reclassification of this waste site to no action or remedial action. The objectives of the visit were to (1) verify the site location, (2) evaluate the field conditions and possible sampling logistics (i.e., potential contaminants and collection methods), and (3) determine if junction boxes are present that could be used for locating and sampling the pipeline. A junction box containing the 0.15-m (6-in.) VCP line that serviced the 151-F Building was observed at the ground surface during the visit.

A geophysical survey was conducted for the area in the vicinity of the 1607-F3 sanitary septic tank and drain field (Bergstrom 2004). The septic tank was detected; however, no linear anomalies were detected that would correlate to the influent 100-F-26:10 pipeline from the east as shown on a Hanford Site design drawing (M-1904-F, sheet 5 [GE 1954]).

Figure 1. 100-F-26:10 Subsite Location Map.



Contaminants of Potential Concern

Contaminants of potential concern (COPCs) for the 100-F-26 underground pipeline waste site included strontium-90, cesium-137, cobalt-60, europium-152, europium-154, hexavalent chromium, arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver (DOE-RL 2005a). By association, the COPCs identified for the 1607-F3 septic tank and drain field waste site were added to the 100-F-26:10 COPC list and included pesticides, polychlorinated biphenyls (PCBs), and semivolatile organic compounds (SVOCs). As a precautionary measure, gross alpha samples were taken to determine if alpha emitters were present at levels above background. No alpha emitters were found at this site.

Contingencies were provided for adding to the COPC list if anomalies were discovered during confirmatory sampling. No suspected asbestos-containing material or petroleum-stained soil was observed during sampling; therefore, asbestos and total petroleum hydrocarbon analyses were not requested. Field screening for volatile organic compounds (VOCs) was performed and none were detected during sampling; therefore, laboratory analysis for VOCs was not requested.

Confirmatory Sample Design

Historical data, process knowledge, site visit observations, and other available information were used to develop the site-specific sample design. The design called for sampling at the junction boxes where sediment had the greatest opportunity to collect and where wastewater could have pooled, thereby increasing the probability of detecting a leak if one occurred. Test pits were dug to expose the junction boxes and the soil beneath them (Figures 2 and 3).

The pipeline subsite was divided into two service areas for decision-making purposes based on knowledge of the buildings that the pipelines serviced. Service area 1 was designated as the portion of the pipeline upstream of test pit 1 and the pipeline between test pit 1 and test pit 2. Service area 1 included the northern section of the pipeline that previously connected the 182-F and 183-F Buildings. Service area 2 was designated as the remaining portions of pipeline and included the service line from the 151-F Building and the pipeline between test pit 2 and the septic tank.

Focused sampling was used to characterize each pipeline segment. Sediment samples were taken from each of the two junction boxes as well as the soil beneath each junction box. Table 1 provides a summary of the 100-F-26:10 pipeline subsite service area sampling.

Figure 2. 100-F-26:10 Pipeline Subsite Service Areas.

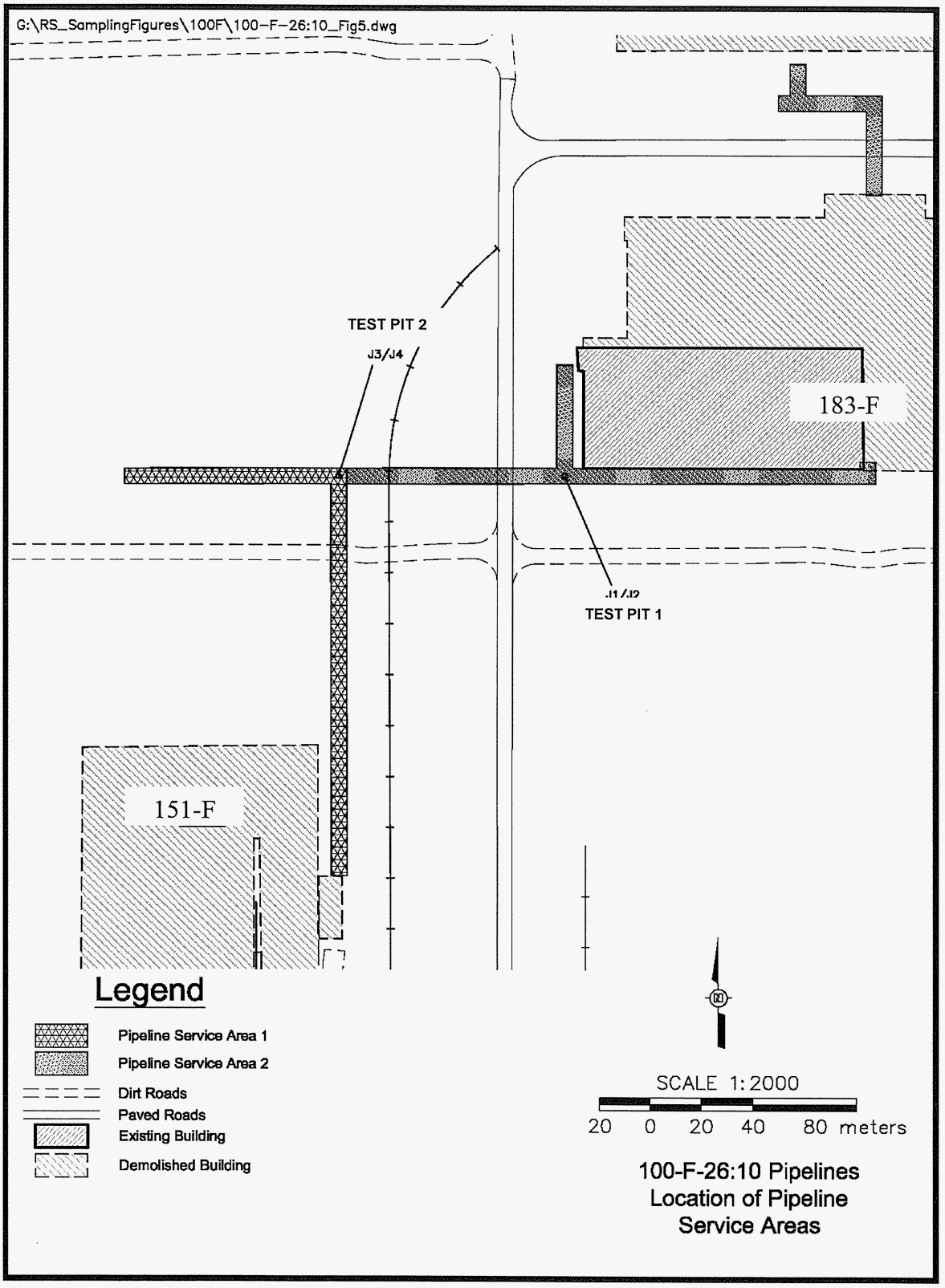


Figure 3. 100-F-26:10 Pipeline Subsite Sampling Locations and Service Area Test Pit Locations.

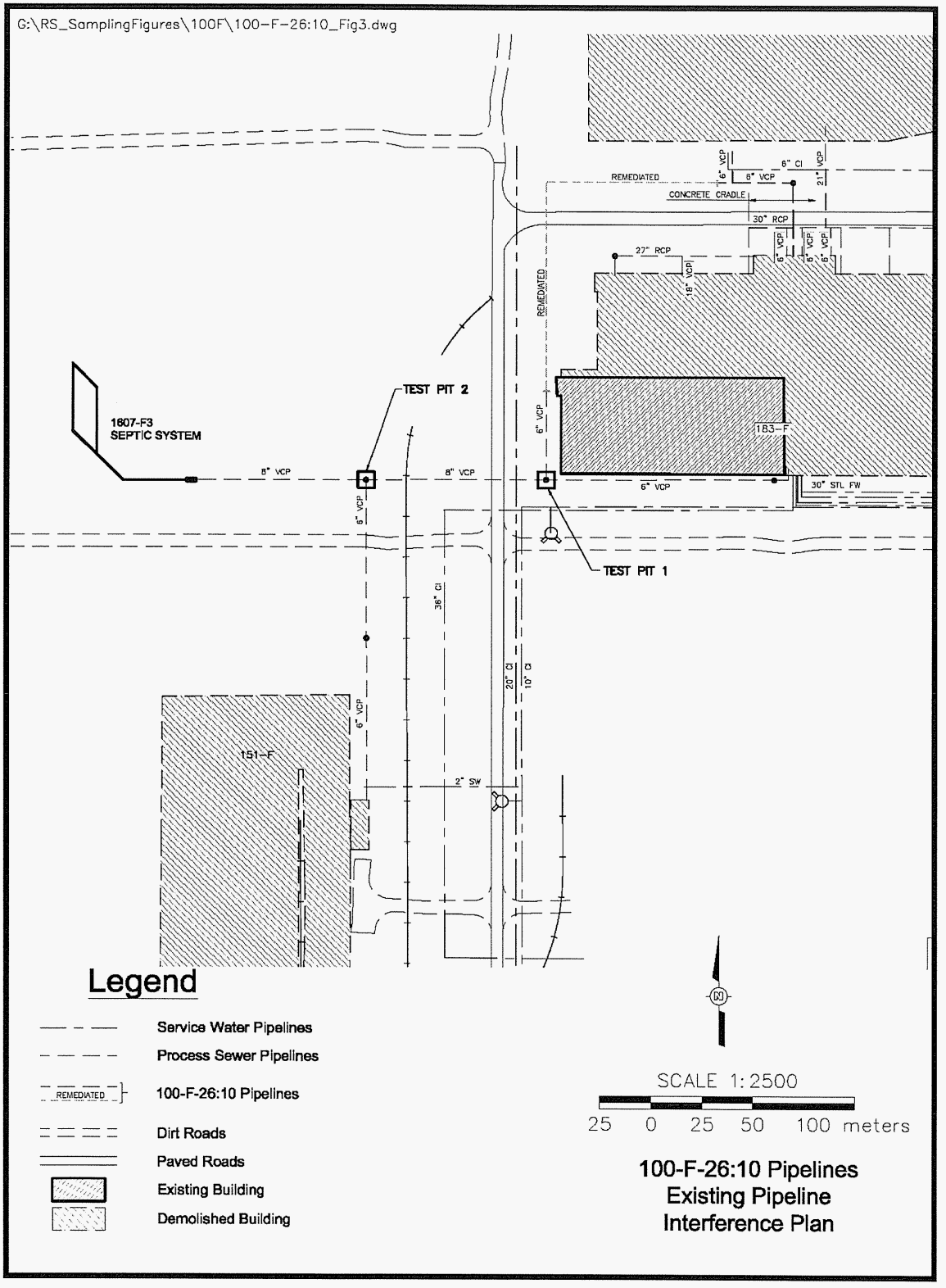


Table 1. Sample Summary for the 100-F-26:10 Pipeline Subsite.

Test Pit	Sample Location	Sample Media	Sample Number	Coordinate Locations [a]	Depth (bgs)	Sample Analysis
1 (service area 2)	J1 Stake No. 38	Junction box sediment	J022T0	N 148001 E 580346	2.7 m (9 ft)	PCB, SVOA, pesticides, GEA, gross alpha,[b] gross beta,[c] ICP metals, and mercury
			J022M0			Hexavalent chromium
	J2 Stake No. 38	Soil under junction box	J022T3		3.4 m (11 ft)	PCB, SVOA, pesticides, GEA, gross alpha,[b] gross beta,[c] hexavalent chromium, ICP metals, and mercury
2 (service area 1)	J3 Stake No. 39	Junction box sediment	J022T1	N 148001 E 580259	3.7 m (12 ft)	PCB, SVOA, pesticides, GEA, gross alpha,[b] gross beta,[c] ICP metals, and mercury
			J022M1			Hexavalent chromium
	J4 Stake No. 39	Soil under junction box	J022T5		4.1 m (13.5 ft)	PCB, SVOA, pesticides, GEA, gross alpha,[b] gross beta,[c] hexavalent chromium, ICP metals, and mercury
Equipment blank	NA	Silica sand	J022T2	NA	NA	ICP metals and mercury
Duplicate	J2 Stake No. 38	Soil	J022T4	N 148001 E 580346	3.4 m (11 ft)	PCB, SVOA, pesticides, GEA, gross alpha,[b] gross beta,[c] hexavalent chromium, ICP metals, and mercury

[a] Washington State Plane (meters).

[b] Gross alpha activity was not detected above background; therefore, further alpha-specific analysis was not needed for plutonium, uranium, or americium.

[c] Gross beta activity was not detected above background; therefore, strontium analysis was not performed.

bgs = below ground surface NA = not applicable
GEA = gamma energy analysis PCB = polychlorinated biphenyl
ICP = inductively coupled plasma SVOA = semivolatile organic analysis

Confirmatory Sample Results

Confirmatory samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency (DOE-RL 2005a). All test pits were excavated and sampled in November 2004 as specified in the 100-F-26:10 work instruction (BHI 2004b) and documented in the field logbook (BHI 2004a). Each service area test pit was dug to expose the junction box and soil beneath, and then sediment and soil samples were taken (Figures 4 and 5). Each of the soil samples collected consisted of 15 separate aliquots of soil taken from beneath the junction box and combined into one sample per location. Excavated material was initially screened for radiological contamination and VOCs. Samples were taken and then sent to the laboratory for analysis of the COPCs. The laboratory results are included in Appendix A.

The maximum detected results for soil and junction box sediment COPCs identified for the 100-F-26:10 pipeline subsite were compared with cleanup levels identified in the RDR/RAWP (DOE-RL 2005b) for each service area. At service area 2 (stake number 38; samples J022T0, J022M0, J022T3, and J022T4) four contaminants (barium, hexavalent chromium, copper, and lead) were in excess of the RAGs. At service area 1 (stake number 39; samples J022T1, J022M1, and J022T5) 10 contaminants (barium, chromium, hexavalent chromium, copper, lead, mercury, nickel, zinc, gamma-chlordane, and aroclor-1260) were in excess of the RAGs.

Figure 4. 100-F-26:10 Pipeline Subsite – Service Area 2, Stake Number 38 Test Pit. (View is to the northwest.)

Figure 5. 100-F-26:10 Pipeline Subsite – Service Area 1, Stake Number 39 Test Pit.

RESidual RADioactivity modeling (BHI 2005) predicted that the contaminants barium, chromium, hexavalent chromium, copper, lead, mercury, nickel, zinc, gamma-chlordane, and aroclor-1260 would not reach groundwater or the river within 1,000 years. However, hexavalent chromium exceeded direct exposure, groundwater protection, and river protection levels for both service areas. For this reason, service areas 1 and 2 were recommended for remediation.

REMEDIAL ACTION SUMMARY

In preparation for the site remediation, two road crossings were excavated, sampled, and immediately backfilled in January 2007. Remediation of the 100-F-26:10 waste site was performed from March 7 through 12, 2007.

The site was excavated between 2.4 m (8 ft) and 4.3 m (14 ft) below grade, resulting in approximately 1,900 BCM (2,500 BCY) of material disposed at the Environmental Restoration Disposal Facility, including removal of approximately 600 m (1,970 ft) of pipeline. Approximately 4,200 BCM (5,500 BCY) of overburden soil was removed and stockpiled for use as clean backfill. The pipeline was encased in concrete its entire length. No anomalies or stained soil were discovered during remediation. Figure 6 provides an aerial photograph of the pipeline excavation. Additional photographs of the remediation are provided in Appendix B. Refer to Figure 7 for the post-excavation topography.

Figure 6. 100-F-26:10 Post-Excavation Aerial Photograph (August 2007).

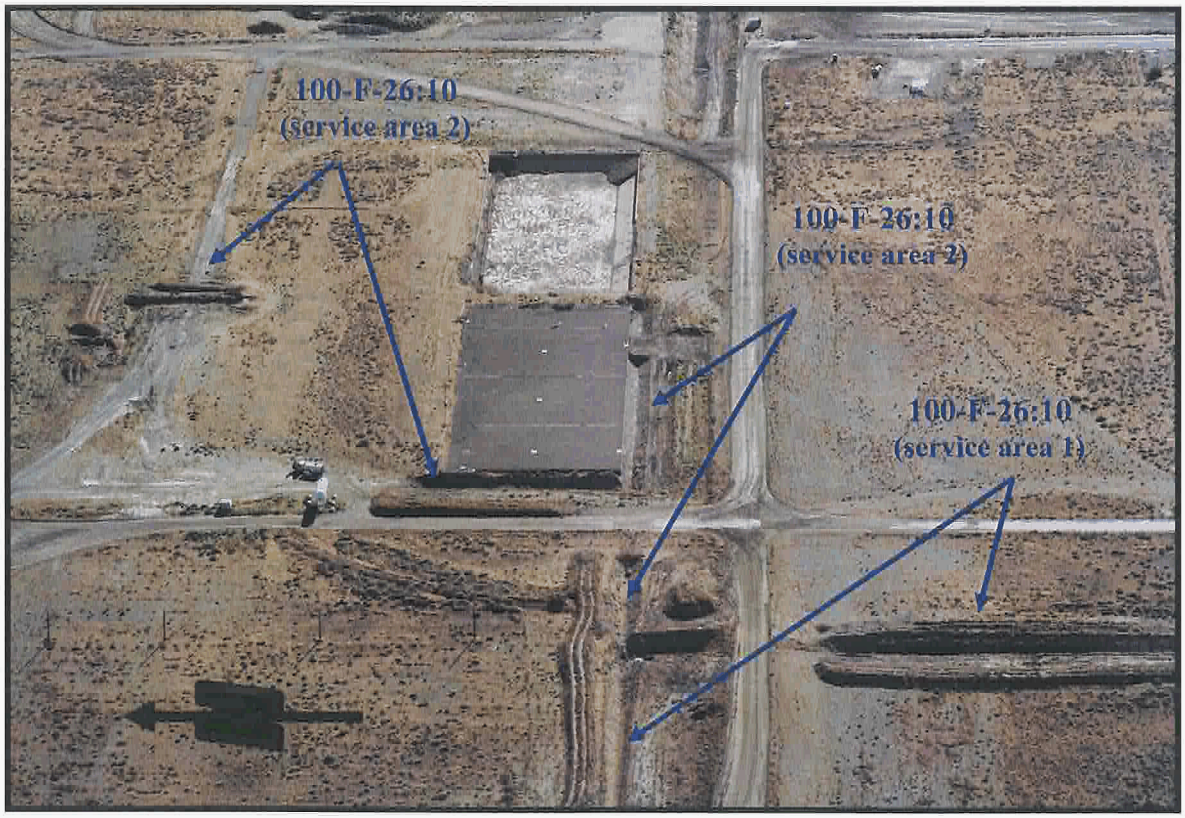
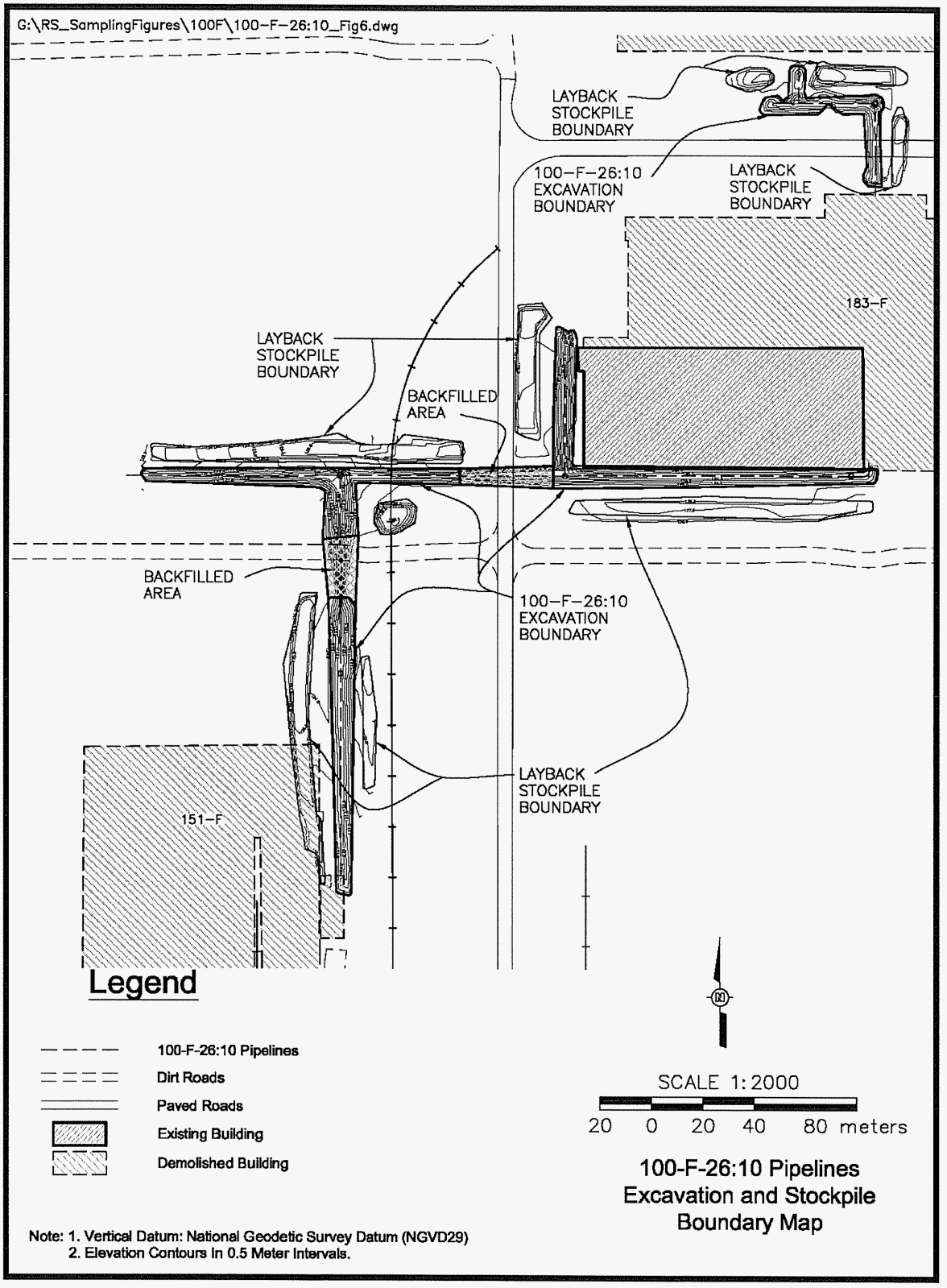


Figure 7. 100-F-26:10 Post-Excavation Topography.



FIELD SCREENING

Radiological contamination was not anticipated or encountered during remediation of the 100-F-26:10 pipelines site. However, radiological field screening was conducted during and after the site remediation to ensure that radionuclides were not present. Field screening at the site included using a Global Positioning Environmental Radiological Surveyor (GPERS) with instrumentation specific to the detection of radiation associated with gamma-emitting radionuclides. The radiological surveys for the 100-F-26:10 pipeline site are provided in Appendix C.

VERIFICATION SAMPLING ACTIVITIES

RAGs are the specific numeric goals against which the cleanup verification data are evaluated to demonstrate attainment of the remedial action objectives for the site. Verification sampling for the 100-F-26:10 pipeline site was performed in January and August 2007 (WCH 2007a, 2007b) to collect data to determine if the RAGs had been met. 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 for Verification Sampling

The COCs/COPCs for verification sampling were determined based on the confirmatory sampling results from the 100-F-26:10 waste site. The COCs/COPCs were identified in the verification work instruction (WCH 2007d) as cesium-137, europium-152, arsenic, barium, boron, cadmium, total chromium, cobalt, copper, lead, manganese, molybdenum, nickel, vanadium, zinc, hexavalent chromium, gamma-chlordane, SVOCs, and aroclor-1260.

The verification samples were analyzed by gamma energy analysis and for pesticides, SVOCs, PCBs, metals by inductively coupled plasma analysis, mercury and hexavalent chromium, which included all of the COCs/COPCs listed in the verification work instruction. The road crossing samples were additionally analyzed for nickel-63 and total strontium.

Verification Sampling Design

This section describes the basis for selection of an appropriate sample design and determination of the number of verification samples that were collected. The 100-F-26:10 waste site was divided into three decision units for the purpose of verification sampling. The first decision unit consisted of the excavation footprint of the pipeline, the second decision unit consisted of the overburden stockpiles, and the third decision unit consisted of the pipeline excavations underlying the haul road (road-crossing area) and the overburden stockpiles used to backfill in the road crossings. A summary of the samples collected and the analyses performed for the verification sampling event are presented in Table 2.

Table 2. Verification Sample Summary for the 100-F-26:10 Waste Site.[a] (2 Pages)

Sample Location	Sample Number	Coordinate Locations [b]	Sample Analysis
Excavation area, location 1	J15F77	N 148000.5 E 580231.1	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 2	J15F78	N 147995.3 E 580258.6	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 3	J15F79	N 147999.9 E 580290	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 4	J15F80	N 147869.7 E 580258.9	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 5	J15F81	N 147943.8 E 580258.8	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 6	J15F82	N 147943.8 E 580258.8	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 7	J15F83	N 148037.2 E 580346.1	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 8	J15F85	N 148001.7 E 580420.8	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 9	J15F86	N 148147.8 E 580429.8	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Excavation area, location 10	J15F87	N 148116.1 E 580466.6	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Equipment blank	J15F88	NA	ICP metals, mercury, SVOA
Duplicate of location 7	J15F84	N 148037.2 E 580346.1	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Stockpile A	J15F73	NA	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Stockpile B	J15F74	NA	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Stockpile C	J15F75	NA	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Stockpile D	J15F76	NA	GEA, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Road-crossing at east-west haul road	J14CB9	N 147972.5 E 580258.7	GEA, Ni-63, Sr-90, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Road-crossing at east-west haul road	J14CC0	N 147959.2 E 580259.0	GEA, Ni-63, Sr-90, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Road-crossing at north-south haul rd.	J14CC1	N 148000.5 E 580314.7	GEA, Ni-63, Sr-90, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Road-crossing at north-south haul rd.	J14CC2	N 148000.6 E 580328.8	GEA, Ni-63, Sr-90, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs
Road-crossing stockpile	J14CB7	N 147983.7 E 580274.4	GEA, Ni-63, Sr-90, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs

Table 2. Verification Sample Summary for the 100-F-26:10 Waste Site.[a] (2 Pages)

Sample Location	Sample Number	Coordinate Locations [b]	Sample Analysis
Road-crossing stockpile	J14CB8	N 147990.4 E 580273.5	GEA, Ni-63, Sr-90, ICP metals, mercury, hexavalent chromium, SVOA, pesticides, PCBs

[a] Source: Field logbooks EFL-1174-2 and EFL-1174-3 (WCH 2007a, 2007b).

[b] Washington State Plane (meters).

GEA = gamma spectroscopy
ICP = inductively coupled plasma
NA = not applicable
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis

Verification Sampling – Excavation Footprint

The decision rule for demonstrating compliance with the cleanup criteria requires comparison of the true population mean, as estimated by the 95% upper confidence limit on the sample mean, with the cleanup level. Therefore, a statistical sampling design was selected as the verification sampling approach for the excavation footprint because the distribution of potential residual soil contamination over this area was uncertain. 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. This sampling approach is referred to by the Washington State Department of Ecology as "area-wide sampling."

The sampling area was restricted to a narrow segment of the excavation floor directly below the location of the removed pipelines. This area (Figure 8) was delineated in Visual Sample Plan[1] and used as the basis for location of a random-start systematic grid for verification soil sample collection locations. A total of 10 soil samples were collected on a random-start, triangular grid for this sampling area. A triangular grid was selected for this investigation based on studies that indicate triangular grids are superior to square grids (Gilbert 1987). Additional discussion of the development of the statistical verification design is provided in the 100-F-26:10 verification work instruction (WCH 2007d).

Verification Sampling – Overburden Stockpile

Verification sampling of the overburden stockpiles was performed to evaluate the suitability of the soil for use as clean backfill for the excavation. Because this material consists of overburden material that was not believed to have received discharges from the sanitary sewer system, a statistical sampling design was not warranted, and professional judgment was used to develop the sampling design. The stockpiles were grouped into four subsets (A through D) for sampling purposes (Figure 9). Sampling at the overburden stockpiles consisted of the collection of 25 aliquots of soil distributed across the surface of each stockpile subset and combining them into one sample per group for laboratory analysis.

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

Figure 8. Verification Soil Sample Locations at the 100-F-26:10 Pipeline Excavation Footprint.

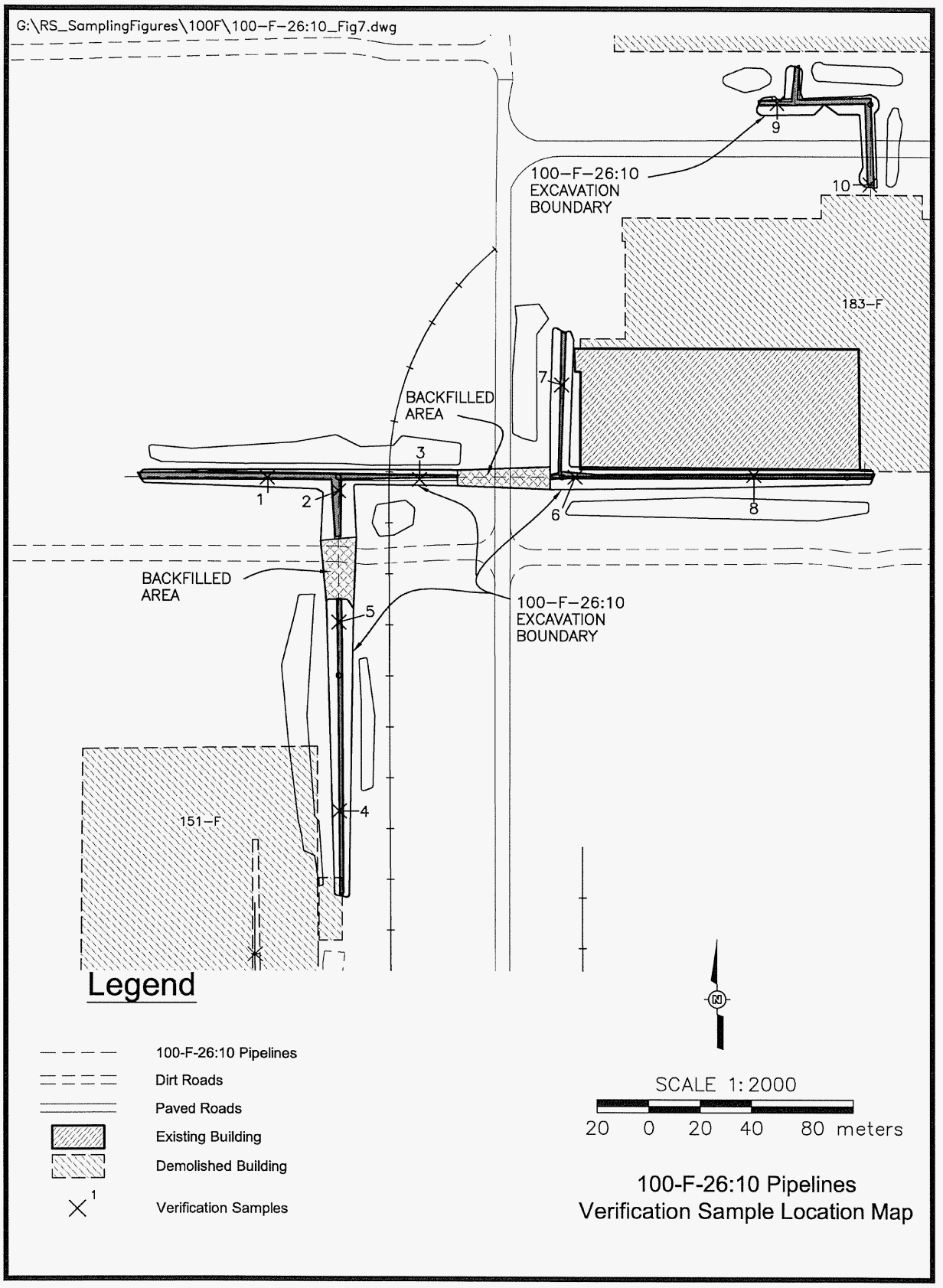
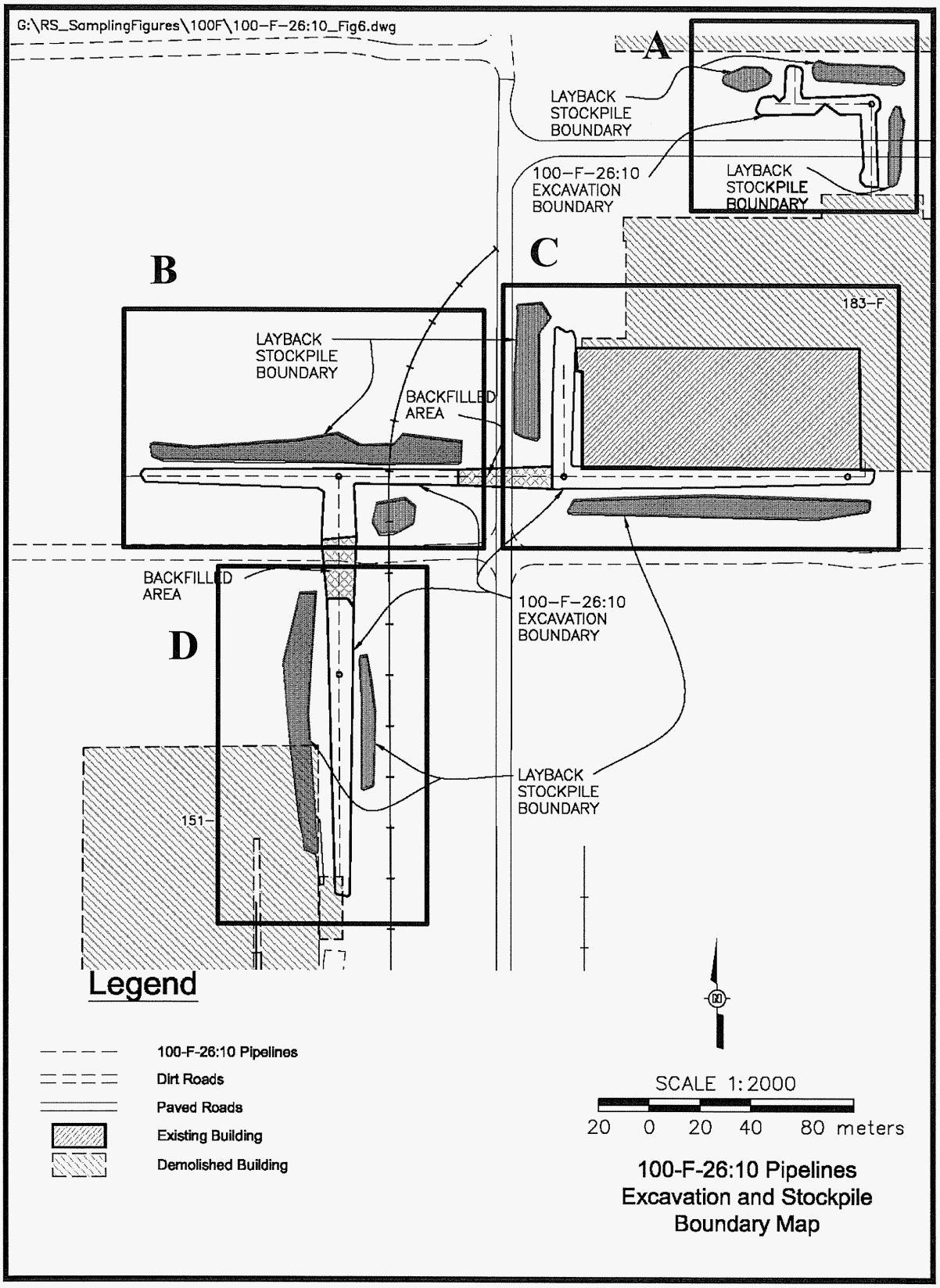


Figure 9. Grouping of Overburden Stockpiles for Verification Sampling Purposes.



Verification Sampling – Road-Crossing Area

Verification sampling of the road-crossing areas was performed after removal of the pipeline and prior to backfilling this portion of the excavation. No staining or releases from the pipeline at these locations was observed. Because these segments of the pipeline underlie a heavily used haul road, verification sampling was conducted immediately following pipeline removal to limit disruption to ongoing transportation activities. Two soil samples were collected at the base of each portion of the excavation. A sample was also collected from each of the overburden stockpiles used to backfill the road crossings. Once the samples were collected, the excavation was backfilled and the haul road reconstructed. All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the *100 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2005a).

Verification Sampling Results

Verification samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods. The laboratory-reported data results for all constituents are stored in the Environmental Restoration (ENRE) System project-specific database prior to submission for archival in the Hanford Environmental Information System (HEIS) site-wide database and are summarized in Appendix D.

As noted earlier, the 100-F-26:10 waste site was divided into three decision units for verification sampling: (1) excavation footprint, (2) overburden stockpile, and (3) road-crossing area. Evaluation of the verification data from the excavation footprint was calculated using the 95% upper confidence limit on the true population mean for residual concentrations of COCs/COPCs. The calculations were also performed on other analytes included in the analyses requested for the COCs/COPCs. These calculations are provided in Appendix E. When a nonradionuclide analyte was detected in fewer than 50% of the verification samples collected, the maximum detected value was used for comparison against the RAGs. If no detections for a given analyte were reported in the data set, no statistical evaluation or calculations were performed for that analyte. Evaluation of the verification data from the overburden stockpile and road crossing areas was performed by direct comparison of the maximum sample results for each detected analyte against cleanup criteria.

Comparisons of the statistical and maximum results for analytes with the shallow zone RAGs for the three decision units are summarized in Tables 3a, 3b, and 3c. 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 Database* (Ecology 2005) under *Washington Administrative Code* (WAC) 173-340-740(3) for aluminum, calcium, iron, magnesium, potassium, silicon, and sodium; therefore, these constituents are not considered site COCs. Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in samples collected at the site, but are not considered within statistical calculations or the following tables, as these isotopes are not related to the operational history of the site and were detected below background levels (based on an assumption of secular equilibrium, the background activities for radium-228 and thorium-228 are equal to the statistical background activity of 1.32 pCi/g for thorium-232 provided in DOE-RL [1996]).

Table 3a. Comparison of Statistical Contaminant Concentrations to Action Levels for the 100-F-26:10 Excavation Footprint Verification Sampling Event. (2 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Antimony[b]	1.0 (<BG)	32	5[c]	5[c]	No	--
Arsenic	4.4 (<BG)	20	20	20	No	--
Barium	74.6 (<BG)	5,600	132[c]	224	No	--
Beryllium	0.23 (<BG)	10.4[d]	1.51[c]	1.51[c]	No	--
Boron[e]	4.2	16,000	320	--[f]	No	--
Chromium (total)	9.6 (<BG)	80,000	18.5[c]	18.5[c]	No	--
Cobalt	6.1 (<BG)	1,600	32	--[f]	No	--
Copper	12.3 (<BG)	2,960	59.2	22.0[c]	No	--
Hexavalent chromium	0.26	2.1	4.8[g]	2	No	--
Lead	10.8	353	10.2[c]	10.2[c]	Yes	Yes[h]
Manganese	289 (<BG)	11,200	512[c]	512[c]	No	--
Mercury	0.01 (<BG)	24	0.33[c]	0.33[c]	No	--
Molybdenum[e]	0.64	400	8	--[f]	No	--
Nickel	10.7 (<BG)	1,600	19.1[c]	27.4	No	--
Selenium	1.5	400	5	1	Yes	Yes[h]
Vanadium	33.0 (<BG)	560	85.1[c]	--[f]	No	--
Zinc	36.6 (<BG)	24,000	480	67.8[c]	No	--
Aroclor-1254	0.057	0.5	0.017[i]	0.017[i]	Yes	Yes[h]
Aroclor-1260	0.054	0.5	0.017[i]	0.017[i]	Yes	Yes[h]
Benzo(a)anthracene	0.041	0.33[i]	0.33[i]	0.33[i]	No	--
Benzo(a)pyrene	0.039	0.33[i]	0.33[i]	0.33[i]	No	--
Benzo(b)fluoranthene	0.019	0.33[i]	0.33[i]	0.33[i]	No	--
Benzo(ghi)perylene[j]	0.026	2400	48	192	No	--
Benzo(k)fluoranthene	0.048	0.33[i]	0.33[i]	0.33[i]	No	--
Bis(2-ethylhexyl) phthalate	0.145	71.4	0.625	0.36	No	--
Chrysene	0.060	0.33[i]	0.33[i]	0.33[i]	No	--
Dieldrin	0.0049	0.0625	0.003[i]	0.003[i]	Yes	Yes[h]
Di-n-butylphthalate	0.026	8,000	160	540	No	--
Fluoranthene	0.120	3,200	64	18.0	No	--

Table 3a. Comparison of Statistical Contaminant Concentrations to Action Levels for the 100-F-26:10 Excavation Footprint Verification Sampling Event. (2 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Statistical Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Indeno(1,2,3-cd)pyrene	0.024	1.37	0.33[i]	0.33[i]	No	--
Methoxychlor	0.0017	400	4	1.67	No	--
Phenanthrene[j]	0.098	24,000	240	1920	No	--
Pyrene	0.110	2,400	48	192	No	--

[a] Lookup values and RAGs obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

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

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

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

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

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

[g] 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 *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b), based on updated oral reference dose value (as provided in the Integrated Risk Information System) (EPA 2006).

[h] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005), residual concentrations are not expected to migrate more than 3 m (10 ft) vertically in 1,000 years (based on the lowest soil-partitioning distribution coefficient [dieldrin] of 25.6 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of all contaminants are predicted to be protective of groundwater and the Columbia River.

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

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

--	= not applicable	RAG	= remedial action goal
BG	= background	RESRAD	= RESidual RADioactivity (dose assessment model)
COC	= contaminant of concern	RDL	= required detection limit
COPC	= contaminant of potential concern	WAC	= *Washington Administrative Code*

Table 3b. Comparison of Maximum Concentrations to Action Levels for the 100-F-26:10 Overburden Stockpile Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Antimony[b]	0.88 (<BG)	32	5[c]	5[c]	No	--
Arsenic	4.7 (<BG)	20	20	20	No	--
Barium	117 (<BG)	5,600	132[c]	224	No	--
Beryllium	0.28 (<BG)	10.4[d]	1.51[c]	1.51[c]	No	--
Boron[e]	5.8	16,000	320	--[f]	No	--
Chromium (total)	10.7 (<BG)	80,000	18.5[c]	18.5[c]	No	--
Cobalt	6.8 (<BG)	1,600	32	--[f]	No	--
Copper	15.8 (<BG)	2,960	59.2	22.0[c]	No	--
Hexavalent chromium	0.27	2.1	4.8[g]	2	No	--
Lead	10.7	353	10.2[c]	10.2[c]	Yes	Yes[h]
Manganese	291 (<BG)	11,200	512[c]	512[c]	No	--
Nickel	12.3 (<BG)	1,600	19.1[c]	27.4	No	--
Selenium	1.8	400	5	1	Yes	Yes[h]
Vanadium	36.5 (<BG)	560	85.1[c]	--[f]	No	--
Zinc	51.9 (<BG)	24,000	480	67.8[c]	No	--
Aroclor-1254	0.008	0.5	0.017[i]	0.017[i]	No	--
Aroclor-1260	0.010	0.5	0.017[i]	0.017[i]	No	--
Benzo(a)pyrene	0.018	0.33[i]	0.33[i]	0.33[i]	No	--
Benzo(b)fluoranthene	0.019	0.33[i]	0.33[i]	0.33[i]	No	--
Benzo(k)fluoranthene	0.025	0.33[i]	0.33[i]	0.33[i]	No	--
Bis(2-ethylhexyl) phthalate	0.25	71.4	0.625	0.36	No	--
Chrysene	0.023	0.33[i]	0.33[i]	0.33[i]	No	--
Di-n-butylphthalate	0.34	8,000	160	540	No	--
Fluoranthene	0.026	3,200	64	18.0	No	--

Table 3b. Comparison of Maximum Concentrations to Action Levels for the 100-F-26:10 Overburden Stockpile Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Pyrene	0.33	2,400	48	192	No	--

[a] Lookup values and RAGs obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.
[b] Hanford Site-specific background not available. Value is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[c] Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).
[d] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m^3 (WDOH 1997).
[e] No Hanford Site-specific or Washington State background value available.
[f] No cleanup level is available from the *Cleanup Levels and Risk Calculations (CLARC) Database* (Ecology 2005), and no bioconcentration factor or ambient water quality criteria values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).
[g] 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 *Remedial Design Report/Remedial Action Work Plan* (DOE-RL 2005b), based on updated oral reference dose value (as provided in the Integrated Risk Information System) (EPA 2006).
[h] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years (based on the lowest soil-partitioning distribution coefficient [lead] of 30 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of all contaminants are predicted to be protective of groundwater and the Columbia River.
[i] Where cleanup levels are less than RDLs, cleanup levels default to RDLs (WAC 173-340-707(2), 1996 and DOE-RL 2005b).

-- = not applicable
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
ND = Not detected
RAG = remedial action goal
RESRAD = RESidual RADioactivity (dose assessment model)
RDL = required detection limit
WAC = *Washington Administrative Code*

Table 3c. Comparison of Maximum Contaminant Concentrations to Action Levels for the 100-F-26:10 Road Crossing Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	8.5	20	20	20	No	--
Barium	54 (<BG)	5,600	132[b]	224	No	--
Beryllium	0.29 (<BG)	10.4[c]	1.51[b]	1.51[b]	No	--
Boron[d]	1.6	16,000	320	--[e]	No	--
Cadmium[f]	0.15 (<BG)	13.9	0.81[b]	0.81[b]	No	--

Table 3c. Comparison of Maximum Contaminant Concentrations to Action Levels for the 100-F-26:10 Road Crossing Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals[a] (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Chromium (total)	7.8 (<BG)	80,000	18.5[b]	18.5[b]	No	--
Cobalt	5.2 (<BG)	1,600	32	--[e]	No	--
Copper	12.0 (<BG)	2,960	59.2	22.0[b]	No	--
Hexavalent chromium	0.32	2.1	4.8[g]	2	No	--
Lead	24.9	353	10.2[b]	10.2[b]	Yes	Yes[h]
Manganese	257 (<BG)	11,200	512[b]	512[b]	No	--
Molybdenum[d]	0.47	400	8	--[e]	No	--
Nickel	10.5 (<BG)	1,600	19.1[b]	27.4	No	--
Vanadium	31.7 (<BG)	560	85.1[b]	--[e]	No	--
Zinc	40.5 (<BG)	24,000	480	67.8[b]	No	--
4,4'-DDT	0.0015	2.94	0.0257	0.005[i]	No	--
Bis(2-ethylhexyl) phthalate	0.86	71.4	0.625	0.36	Yes	Yes[h]
Di-n-butylphthalate	0.039	8,000	160	540	No	--
Methoxychlor	0.003	400	4	1.67	No	--

[a] Lookup values and RAGs obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b) or calculated per WAC-173-340-720, 173-340-730, and 173-340-740, Method B, 1996, unless otherwise noted.

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

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

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

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

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

[g] 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 the Integrated Risk Information System) (EPA 2006).

[h] Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years (based on the lowest soil-partitioning distribution coefficient [lead] of 30 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of all contaminants are predicted to be protective of groundwater and the Columbia River.

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

-- = not applicable
BG = background
COC = contaminant of concern
COPC = contaminant of potential concern
RAG = remedial action goal
RESRAD = RESidual RADioactivity (dose assessment model)
RDL = required detection limit
WAC = *Washington Administrative Code*

DATA EVALUATION

Evaluation of the results listed in Tables 3a, 3b, and 3c indicates 10 contaminants exceed the soil RAGs for the protection of groundwater and/or the Columbia River in one or more of the decision units. The contaminants include lead, selenium, aroclor-1254, aroclor-1260, bis(2-ethylhexyl)phthalate, and dieldrin. Data were not collected on the vertical extent of residual contamination, but, given the lowest soil-partitioning coefficient (dieldrin is the lowest, at 25.6 mL/g), RESidual RADioactivity modeling (BHI 2005) predicts that these contaminants will not migrate more than 3 m (10 ft) vertically in 1,000 years. The vadose zone beneath the 100-F-26:10 excavation is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants 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. All other contaminants for the 100-F-26:10 waste site were either not detected or quantified below RAGs. All of the residual contaminant concentrations were below the direct exposure RAGs.

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 100-F-26:10 remediation footprint is included in the statistical calculations (Appendix E). The three-part test is not applicable to the overburden stockpile or the road-crossing results because direct evaluation of nonstatistical sampling results was used as the compliance basis. All residual COC/COPC concentrations for the 100-F-26:10 remediation footprint pass the three-part test, except for lead. As noted above, lead is not predicted to migrate more than 3 m (10 ft) vertically in 1,000 years. Therefore, residual concentrations of lead within these sampling areas are also protective of groundwater and the Columbia River.

Assessment of the risk requirements for the 100-F-26:10 waste site is determined by calculation of the hazard quotient and excess carcinogenic risk values for nonradionuclides. These calculations are located in Appendix E. The requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6}, and a cumulative excess carcinogenic risk of less than 1×10^{-5}. These risk values were conservatively calculated for the entire waste site using the highest values from each of the three decision units. Risk values were not calculated for constituents that were not detected or were detected at concentrations below Hanford Site or Washington State background values. The calculations indicated that all individual hazard quotients for noncarcinogenic constituents are less than 1.0. The cumulative hazard quotient for the 100-F-26:10 waste site is 1.2×10^{-1}. All individual cumulative carcinogenic risk values are less than 1×10^{-6}. The cumulative carcinogenic risk value is 2.0×10^{-6}. Therefore, nonradionuclide risk requirements are met.

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the verification sampling approach and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications. The DQA for the 100-F-26:10 waste site established that the data are of the right type, quality, and quantity to support site verification decisions within specified error

tolerances. All analytical data were found to be acceptable for decision-making purposes. The evaluation verified that the sample design was sufficient for the purpose of clean site verification. The detailed DQA is presented in Appendix F.

SUMMARY FOR INTERIM CLOSURE

The 100-F-26:10 waste site has been remediated in accordance with the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2005b). The site was remediated by removing approximately 1,900 BCM (2,500 BCY) of material for disposal at the Environmental Restoration Disposal Facility. Statistical and judgmental sampling to verify the completeness of remediation was performed, and analytical results for the three decision units (excavation footprint, overburden stockpiles and road crossings) were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection. Accordingly, an interim closure reclassification is supported for the 100-F-26:10 waste site. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

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APPENDIX A

100-F-26:10 PIPELINE SUBSITE CONFIRMATORY DATA SUMMARY TABLES

Table A-1. 100-F-26:10 Radionuclide Data Results.

Sample Location	HEIS Number	Sample Date	Americium-241 GEA			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 1 Soil	J022T3	11/19/04	0.1	U	0.1	0.028	U	0.028	0.03	U	0.03	0.067	U	0.067	0.11	U	0.11	0.072	U	0.072
Duplicate of J022T3	J022T4	11/19/04	0.31	U	0.31	0.037	U	0.037	0.034	U	0.034	0.095	U	0.095	0.14	U	0.14	0.13	U	0.13
Test Pit 2 Soil	J022T5	11/22/04	0.13	U	0.13	0.033	U	0.033	0.038	U	0.038	0.081	U	0.081	0.13	U	0.13	0.089	U	0.089
Test Pit 1 Sediment	J022T0	11/19/04	0.093	U	0.093	0.246		0.027	0.024	U	0.024	0.059	U	0.059	0.08	U	0.08	0.076	U	0.076
Test Pit 2 Sediment	J022T1	11/19/04	0.29	U	0.29	0.58		0.051	0.082	U	0.082	1.02		0.089	0.13	U	0.13	0.13	U	0.13

Sample Location	HEIS Number	Sample Date	Gross alpha			Gross beta			Potassium-40			Radium-226			Radium-228			Thorium-228 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 1 Soil	J022T3	11/19/04	9.35		4	14.7		5.3	15.8		0.24	0.536		0.048	0.825		0.12	0.7		0.03
Duplicate of J022T3	J022T4	11/19/04	10.8		4.5	23.8		5.4	17.5		0.26	0.59		0.083	0.829		0.2	0.707		0.045
Test Pit 2 Soil	J022T5	11/22/04	6.48		3.1	19.6		7.3	15.8		0.3	0.554		0.056	0.847		0.17	0.734		0.04
Test Pit 1 Sediment	J022T0	11/19/04	7.4		3.7	13.4		6.1	8.85		0.23	0.93		0.048	0.941		0.1	0.936		0.029
Test Pit 2 Sediment	J022T1	11/19/04	5.54		3.6	12.6		6	11.4		0.33	0.486		0.082	0.652		0.18	0.522		0.048

Sample Location	HEIS Number	Sample Date	Thorium-232 GEA			Uranium-235 GEA			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test Pit 1 Soil	J022T3	11/19/04	0.825		0.12	0.1	U	0.1	3.4	U	3.4
Duplicate of J022T3	J022T4	11/19/04	0.829		0.2	0.16	U	0.16	5.2	U	5.2
Test Pit 2 Soil	J022T5	11/22/04	0.847		0.17	0.12	U	0.12	4.5	U	4.5
Test Pit 1 Sediment	J022T0	11/19/04	0.941		0.1	0.089	U	0.089	2.7	U	2.7
Test Pit 2 Sediment	J022T1	11/19/04	0.652		0.18	0.16	U	0.16	4.6	U	4.6

Acronyms and notes apply to all tables in Appendix B.
Note: Data qualified with B, C, and/or J, are considered real values.
B = blank contamination (organic compounds)
C = blank contamination (inorganic compounds)
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
J = estimate
MDA = minimum detectable activity
PQL = practical quantitation limit
Q = qualifier
U = undetected

Table A-2. 100-F-26:10 Inorganic Data Results. (2 Pages)

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J022T2	11/19/04	279		2.7	0.24	U	0.24	0.23		0.22	3.6		0.03	0.02		0.008	0.4	C	0.25
Test Pit 1 Soil	J022T3	11/19/04	4860		3.1	0.27	U	0.27	2.3		0.25	42.2		0.04	0.01	U	0.01	3.5	C	0.29
Duplicate of J022T3	J022T4	11/19/04	5020		3.1	0.27	U	0.27	2.8		0.25	41.5		0.04	0.01	U	0.01	2.4	C	0.29
Test Pit 2 Soil	J022T5	11/22/04	5780		3.1	0.27	U	0.27	4.5		0.26	58		0.04	0.01	U	0.01	0.95	C	0.29
Test Pit 1 Sediment	J022T0	11/19/04	14700		19.6	1.8	U	1.8	5.6		1.6	882	C	0.25	0.44		0.06	107	C	1.9
Test Pit 2 Sediment	J022T1	11/19/04	6210		24.1	2.2	U	2.2	8.9		2	164	C	0.31	0.08	U	0.08	7.9	C	2.3

Sample Location	HEIS Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Hexavalent Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J022T2	11/19/04	0.03	U	0.03	196	C	2.4	0.57	C	0.07	0.28		0.06	0.51		0.12			
Test Pit 1 Soil	J022T3	11/19/04	0.11		0.03	4580	C	2.7	9.8	C	0.08	4.8		0.07	12.2		0.14	0.4		0.22
Duplicate of J022T3	J022T4	11/19/04	0.09		0.03	4660	C	2.7	9.5	C	0.08	5		0.07	13.5		0.14	0.21	U	0.21
Test Pit 2 Soil	J022T5	11/22/04	0.12		0.03	3760	C	2.7	9.5	C	0.08	5.6		0.07	12.5		0.14	0.22	U	0.22
Test Pit 1 Sediment	J022M0*	11/19/04																48.4		0.35
Test Pit 2 Sediment	J022M1*	11/19/04																29		0.35
Test Pit 1 Sediment	J022T0	11/19/04	0.23		0.19	22300	C	17.5	15.1	C	0.5	7.7		0.44	28.2		0.88			
Test Pit 2 Sediment	J022T1	11/19/04	0.47		0.23	5070	C	21.5	21.9	C	0.62	5.8		0.54	70.3		1.1			

* Only analyte tested for was hexavalent chromium.

Sample Location	HEIS Number	Sample Date	Iron			Lead			Magnesium			Manganese			Mercury			Molybdenum		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J022T2	11/19/04	492		2.4	0.33		0.19	121	C	0.59	12.3		0.03	0.01	U	0.01	0.2	U	0.2
Test Pit 1 Soil	J022T3	11/19/04	14200		2.7	4.4		0.21	3640	C	0.67	225		0.03	0.01	U	0.01	0.22	U	0.22
Duplicate of J022T3	J022T4	11/19/04	15100		2.7	5.2		0.21	3530	C	0.67	229		0.03	0.01	U	0.01	0.3		0.22
Test Pit 2 Soil	J022T5	11/22/04	15300		2.7	11.9		0.22	3650	C	0.68	261		0.03	0.02	U	0.02	0.23	U	0.23
Test Pit 1 Sediment	J022T0	11/19/04	18500	C	17.5	20.9		1.4	5830	C	4.3	284		0.19	0.11	C	0.02	1.4	U	1.4
Test Pit 2 Sediment	J022T1	11/19/04	29200	C	21.5	111		1.7	2910	C	5.3	220		0.23	1.5	C	0.02	3.1		1.8

Table A-2. 100-F-26:10 Inorganic Data Results. (2 Pages)

Sample Location	HEIS Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J022T2	11/19/04	0.54		0.1	69.9		1.6	0.31	U	0.32	168	C	1.2	0.085	U	0.085	12.7	C	0.43
Test Pit 1 Soil	J022T3	11/19/04	10.7		0.12	722		1.8	0.36	U	0.36	333	C	1.4	0.1	U	0.1	141	C	0.5
Duplicate of J022T3	J022T4	11/19/04	9.4		0.12	784		1.8	0.36	U	0.35	338	C	1.4	0.1	U	0.1	147	C	0.5
Test Pit 2 Soil	J022T5	11/22/04	9.7		0.12	1140		1.9	0.36	U	0.36	343	C	1.4	0.1	U	0.1	139	C	0.5
Test Pit 1 Sediment	J022T0	11/19/04	15.3		0.75	1260	C	11.8	2.3	U	2.3	401		8.8	0.63	U	0.63	1470	C	3.2
Test Pit 2 Sediment	J022T1	11/19/04	26		0.92	1420	C	14.5	2.8	U	2.8	360		10.8	0.77	U	0.77	230	C	3.9

Sample Location	HEIS Number	Sample Date	Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL
Equipment Blank	J022T2	11/19/04	0.55		0.06	1.6		0.11
Test Pit 1 Soil	J022T3	11/19/04	34.9		0.07	27.9		0.13
Duplicate of J022T3	J022T4	11/19/04	38.1		0.07	29.4		0.13
Test Pit 2 Soil	J022T5	11/22/04	35.3		0.07	32.5		0.13
Test Pit 1 Sediment	J022T0	11/19/04	52	C	0.44	66		0.81
Test Pit 2 Sediment	J022T1	11/19/04	38.4	C	0.54	120		1

Table A-3. 100-F-26:10 Organic Data Results. (2 Pages)

Constituent	J022T0 Test Pit 1 Sediment Sample Date 11/19/04			J022T1 Test Pit 2 Sediment Sample Date 11/19/04			J022T3 Test Pit 1 Soil Sample Date 11/19/04			J022T4 Duplicate of J022T3 Sample Date 11/19/04			J022T5 Test Pit 2 Soil Sample Date 11/22/04		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (polychlorinated biphenyls)															
Aroclor-1016	73	U	73	43	U	43	14	U	14	14	U	14	15	U	15
Aroclor-1221	73	U	73	43	U	43	14	U	14	14	U	14	15	U	15
Aroclor-1232	73	U	73	43	U	43	14	U	14	14	U	14	15	U	15
Aroclor-1242	73	U	73	43	U	43	14	U	14	14	U	14	15	U	15
Aroclor-1248	73	U	73	43	U	43	14	U	14	14	U	14	15	U	15
Aroclor-1254	73	U	73	43	U	43	14	U	14	14	U	14	15	U	15
Aroclor-1260	73	U	73	66		43	14	U	14	14	U	14	15	U	15
Pesticides															
Aldrin	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Alpha-BHC	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
alpha-Chlordane	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
beta-1,2,3,4,5,6-Hexachlorocyclohexane	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Delta-BHC	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Dichlorodiphenyldi-chloroethane	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyldi-chloroethylene	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Dichlorodiphenyltri-chloroethane	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Dieldrin	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Endosulfan I	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Endosulfan II	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Endosulfan sulfate	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Endrin	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Endrin aldehyde	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Endrin ketone	37	U	37	43	U	43	3.6	U	3.6	3.5	U	3.5	3.6	U	3.6
Gamma-BHC (Lindane)	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
gamma-Chlordane	18	U	18	39		21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Heptachlor	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Heptachlor epoxide	18	U	18	21	U	21	1.8	U	1.8	1.8	U	1.8	1.8	U	1.8
Methoxychlor	180	U	180	210	U	210	18	U	18	18	U	18	18	U	18
Toxaphene	1800	U	1800	2100	U	2100	180	U	180	180	U	180	180	U	180
SVOAs (semivolatile organic analyses)															
1,2,4-Trichlorobenzene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
1,2-Dichlorobenzene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
1,3-Dichlorobenzene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
1,4-Dichlorobenzene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2,4,5-Trichlorophenol	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
2,4,6-Trichlorophenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2,4-Dichlorophenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2,4-Dimethylphenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2,4-Dinitrophenol	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
2,4-Dinitrotoluene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2,6-Dinitrotoluene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2-Chloronaphthalene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2-Chlorophenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2-Methylnaphthalene	86	J	730	430	U	430	360	U	360	350	U	350	360	U	360
2-Methylphenol (cresol, o-)	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
2-Nitroaniline	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910

Table A-3. 100-F-26:10 Organic Data Results. (2 Pages)

Constituent	J022T0 Test Pit 1 Sediment Sample Date 11/19/04			J022T1 Test Pit 2 Sediment Sample Date 11/19/04			J022T3 Test Pit 1 Soil Sample Date 11/19/04			J022T4 Duplicate of J022T3 Sample Date 11/19/04			J022T5 Test Pit 2 Soil Sample Date 11/22/04		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (semivolatile organic analyses) (continued)															
2-Nitrophenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
3+4 Methylphenol (cresol, m+p)	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
3,3'-Dichlorobenzidine	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
3-Nitroaniline	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
4,6-Dinitro-2-methylphenol	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
4-Bromophenylphenyl ether	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
4-Chloro-3-methylphenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
4-Chloroaniline	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
4-Chlorophenylphenyl ether	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
4-Nitroaniline	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
4-Nitrophenol	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
Acenaphthene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Acenaphthylene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Anthracene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Benzo(a)anthracene	95	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Benzo(a)pyrene	120	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Benzo(b)fluoranthene	180	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Benzo(ghi)perylene	79	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Benzo(k)fluoranthene	160	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Bis(2-chloro-1-methylethyl)ether	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Bis(2-Chloroethoxy)methane	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Bis(2-chloroethyl) ether	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Bis(2-ethylhexyl) phthalate	160	JB	730	120	JB	430	29	JB	360	33	JB	350	29	JB	360
Butylbenzylphthalate	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Carbazole	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Chrysene	270	J	730	43	J	430	360	U	360	350	U	350	360	U	360
Di-n-butylphthalate	84	JB	730	99	JB	430	47	JB	360	55	JB	350	35	JB	360
Di-n-octylphthalate	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Dibenz[a,h]anthracene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Dibenzofuran	40	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Diethylphthalate	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Dimethyl phthalate	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Fluoranthene	240	J	240	23	J	430	360	U	360	350	U	350	360	U	360
Fluorene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Hexachlorobenzene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Hexachlorobutadiene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Hexachlorocyclopentadiene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Hexachloroethane	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Indeno(1,2,3-cd)pyrene	73	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Isophorone	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
N-Nitroso-di-n-propylamine	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
N-Nitrosodiphenylamine	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Naphthalene	68	J	68	430	U	430	360	U	360	350	U	350	360	U	360
Nitrobenzene	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Pentachlorophenol	1800	U	1800	1100	U	1100	900	U	900	890	U	890	910	U	910
Phenanthrene	99	J	730	430	U	430	360	U	360	350	U	350	360	U	360
Phenol	730	U	730	430	U	430	360	U	360	350	U	350	360	U	360
Pyrene	230	J	730	31	J	430	360	U	360	350	U	350	360	U	360

APPENDIX B

REMEDIATION PHOTOGRAPHS

100-F-26:10 Waste Site Excavation
(looking south near former 151-F Building; March 12, 2007).

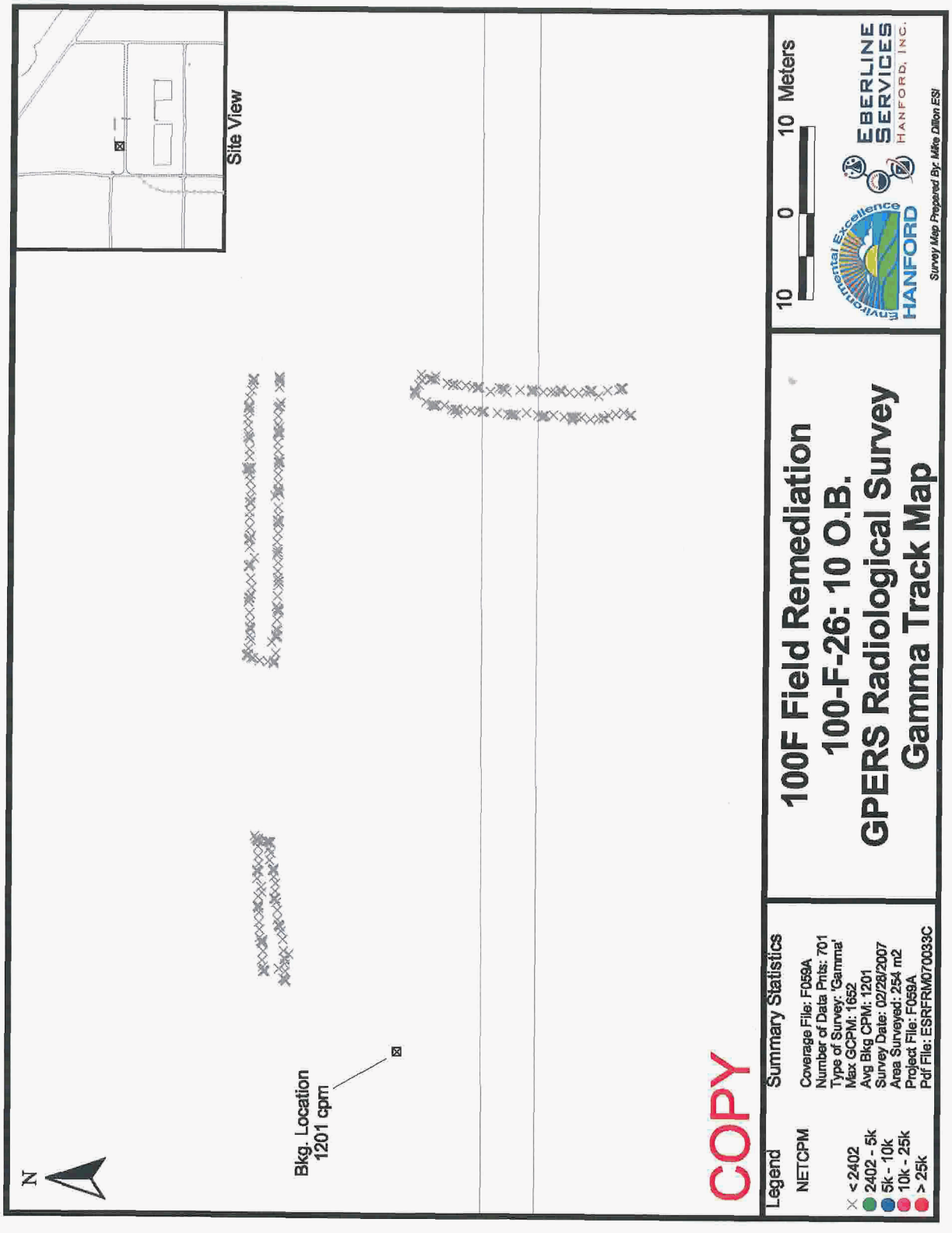
100-F-26:10 Waste Site Excavation
(looking east near former 183-F Building; April 18, 2007).

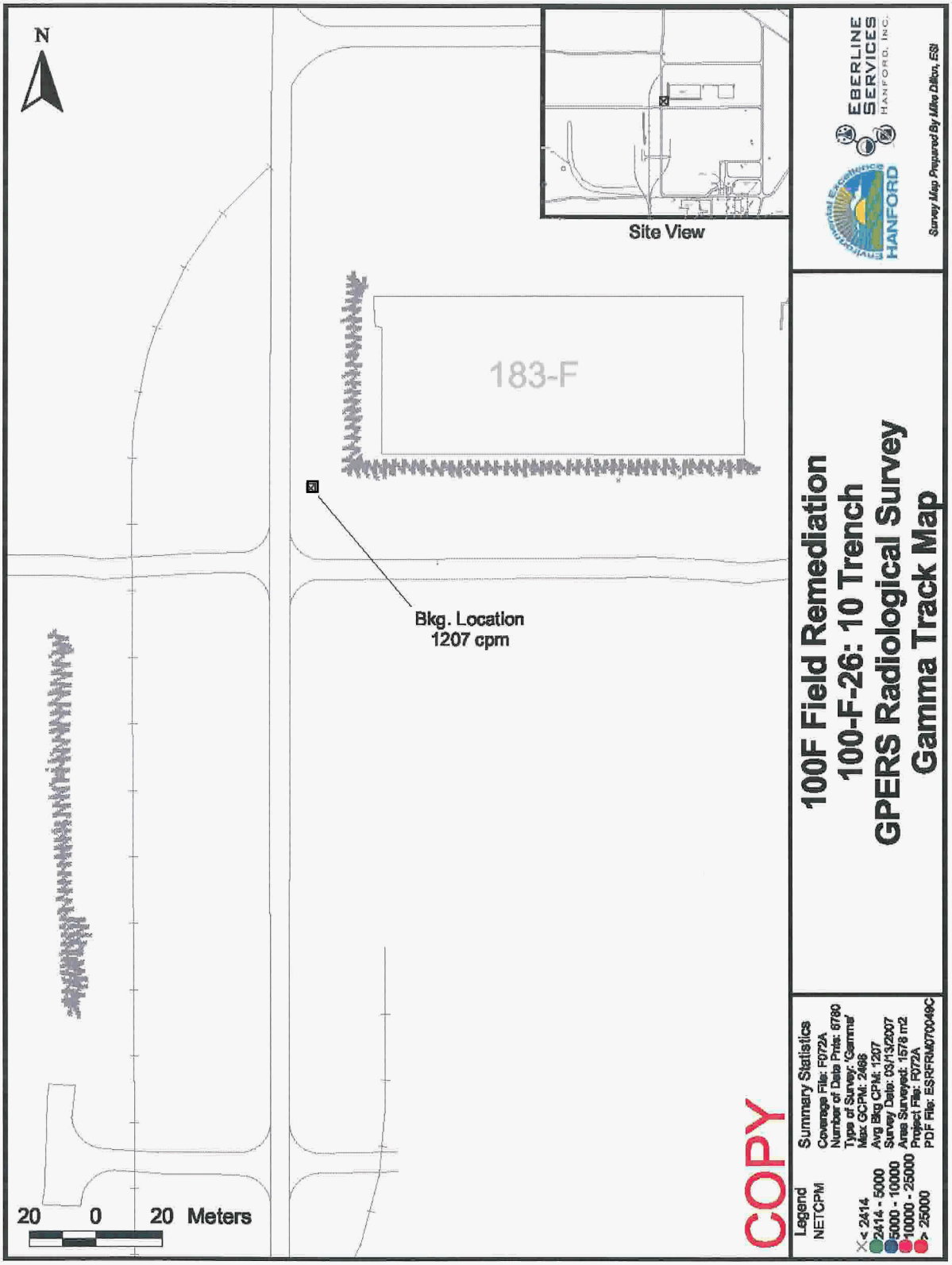
100-F-26:10 Waste Site Excavation
(looking west toward former 1607-F3 septic system; April 18, 2007).

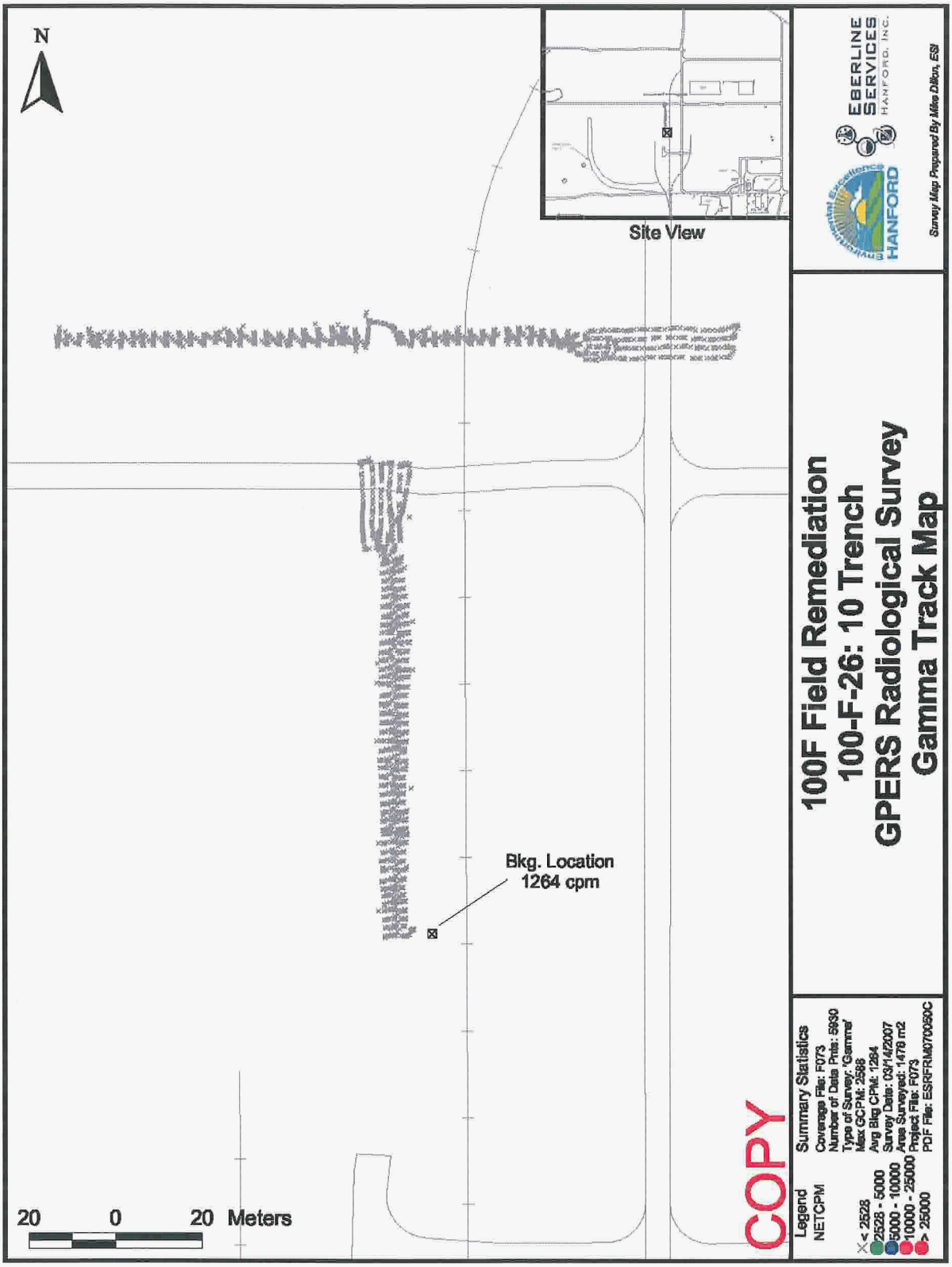
100-F-26:10 Waste Site Excavation
(smaller excavation to the north; looking north; April 18, 2007).

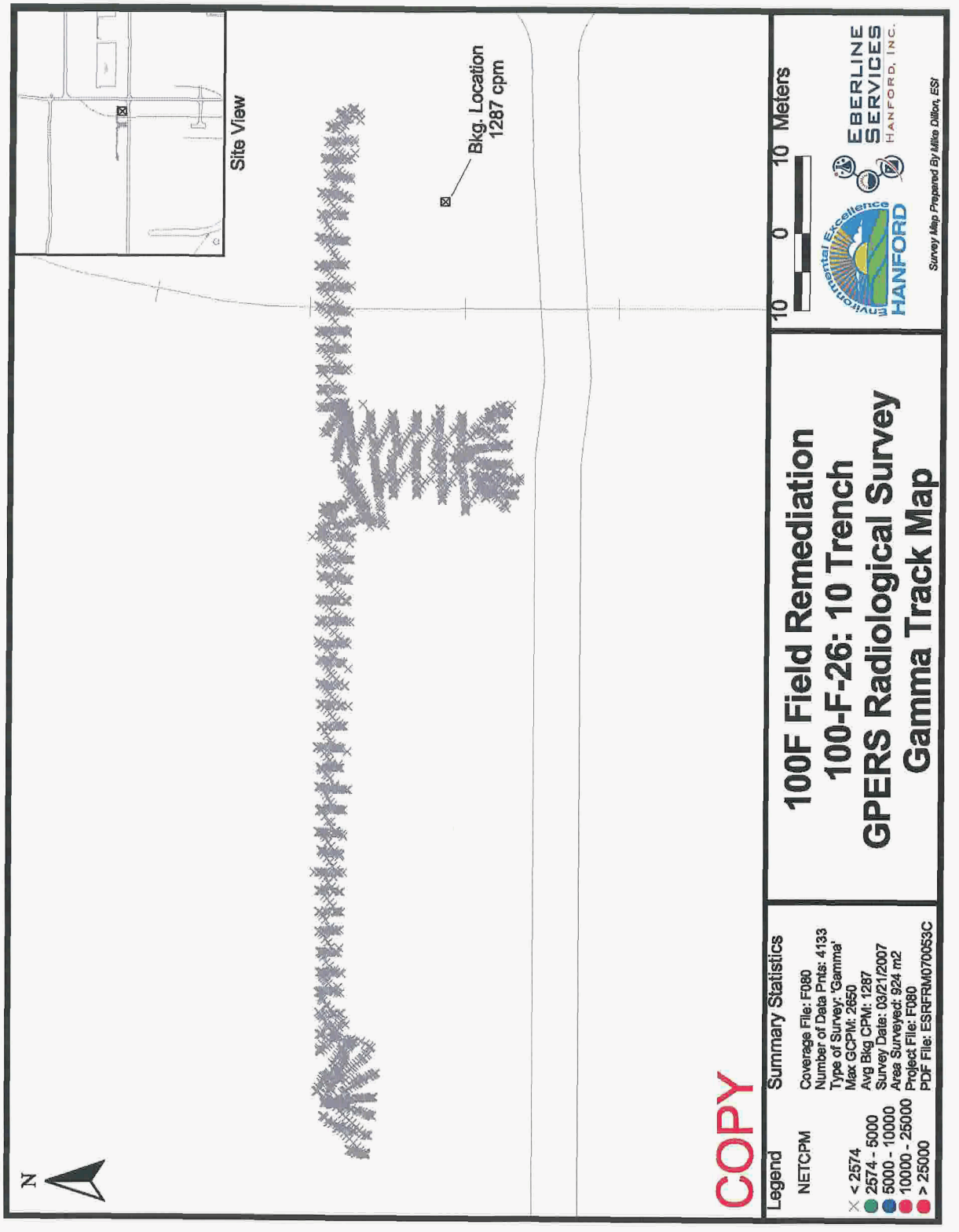
APPENDIX C

POST-REMEDIATION RADIOLOGICAL SURVEYS


Site View
N
Bkg. Location
1201 cpm
COPY
Legend
NETCPM
< 2402
2402 - 5k
5k - 10k
10k - 25k
> 25k
Summary Statistics
Coverage File: F059A
Number of Data Pnts: 701
Type of Survey: 'Gamma'
Max GCPM: 1652
Avg Bkg CPM: 1201
Survey Date: 02/28/2007
Area Surveyed: 254 m2
Project File: F059A
Pdf File: ESRFRM070033C
100F Field Remediation
100-F-26: 10 O.B.
GPERS Radiological Survey
Gamma Track Map
10 0 10 Meters
Environmental Excellence
HANFORD
EBERLINE SERVICES
HANFORD, INC.
Survey Map Prepared By: Mike Dillon ESI


N
Site View
183-F
Bkg. Location
1207 cpm
20 0 20 Meters
COPY
100F Field Remediation
100-F-26: 10 Trench
GPERS Radiological Survey
Gamma Track Map
EBERLINE SERVICES
HANFORD, INC.
HANFORD
Survey Map Prepared By Mike Dillon, ESI
Legend
NETCPM
< 2414
2414 - 5000
5000 - 10000
10000 - 25000
> 25000
Summary Statistics
Coverage File: F072A
Number of Data Pnts: 6780
Type of Survey: 'Gamma'
Max GCPM: 2466
Avg Bkg CPM: 1207
Survey Date: 03/13/2007
Area Surveyed: 1578 m2
Project File: F072A
PDF File: ESRFRM070049C


N
Site View
Bkg. Location
1264 cpm
20 0 20 Meters
COPY
100F Field Remediation
100-F-26: 10 Trench
GPERS Radiological Survey
Gamma Track Map
EBERLINE SERVICES
HANFORD, INC.
HANFORD
Survey Map Prepared By Mike Dillon, ESI
Legend
NETCPM
< 2528
2528 - 5000
5000 - 10000
10000 - 25000
> 25000
Summary Statistics
Coverage File: F073
Number of Data Pnts: 5930
Type of Survey: 'Gamma'
Max GCPM: 2586
Avg Bkg CPM: 1264
Survey Date: 03/14/2007
Area Surveyed: 1478 m2
Project File: F073
PDF File: ESRFRM070090C


Site View
Bkg. Location
1287 cpm
N
COPY
Legend
NETCPM
< 2574
2574 - 5000
5000 - 10000
10000 - 25000
> 25000
Summary Statistics
Coverage File: F080
Number of Data Pnts: 4133
Type of Survey: 'Gamma'
Max GCPM: 2650
Avg Bkg CPM: 1287
Survey Date: 03/21/2007
Area Surveyed: 924 m2
Project File: F080
PDF File: ESRFRM070053C
100F Field Remediation
100-F-26: 10 Trench
GPERS Radiological Survey
Gamma Track Map
10 0 10 Meters
Environmental Excellence
HANFORD
EBERLINE SERVICES
HANFORD, INC.
Survey Map Prepared By Mike Dillon, ESI

APPENDIX D

100-F-26:10 PIPELINE SUBSITE VERIFICATION DATA SUMMARY TABLES

Table D-1. 100-F-26:10 Radionuclide Data Results. (2 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241			Barium-133			Cesium-137			Cobalt-60			Europium-152		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.086	U	0.086				0.095	U	0.095	0.120	U	0.120	0.160	U	0.160
RC-BCL-2	J14CB8	1/22/07	0.320	U	0.320				0.068	U	0.068	0.070	U	0.070	0.160	U	0.160
RC-1	J14CB9	1/22/07	0.067	U	0.067				0.046	U	0.046	0.049	U	0.049	0.130	U	0.130
RC-2	J14CC0	1/22/07	0.090	U	0.090				0.100	U	0.100	0.140	U	0.140	0.160	U	0.160
RC-3	J14CC1	1/23/07	0.068	U	0.068				0.072	U	0.072	0.100	U	0.100	0.130	U	0.130
RC-4	J14CC2	1/23/07	0.070	U	0.070				0.049	U	0.049	0.058	U	0.058	0.140	U	0.140
BCL-A	J15F73	8/14/07	0.076	U	0.076	0.054	U	0.054	0.055	U	0.055	0.052	U	0.052	0.156	U	0.156
BCL-B	J15F74	8/14/07	0.102	U	0.102	0.071	U	0.071	0.077	U	0.077	0.080	U	0.080	0.188	U	0.188
BCL-C	J15F75	8/14/07	0.335	U	0.335	0.107	U	0.107	0.092	U	0.092	0.082	U	0.082	0.235	U	0.235
BCL-D	J15F76	8/14/07	0.087	U	0.087	0.060	U	0.060	0.056	U	0.056	0.060	U	0.060	0.172	U	0.172
SZ-1	J15F77	8/14/07	0.245	U	0.245	0.077	U	0.077	0.069	U	0.069	0.059	U	0.059	0.171	U	0.171
SZ-2	J15F78	8/14/07	0.072	U	0.072	0.075	U	0.075	0.067	U	0.067	0.070	U	0.070	0.170	U	0.170
SZ-3	J15F79	8/14/07	0.026	U	0.026	0.028	U	0.028	0.023	U	0.023	0.024	U	0.024	0.058	U	0.058
SZ-4	J15F80	8/14/07	0.318	U	0.318	0.068	U	0.068	0.068	U	0.068	0.066	U	0.066	0.168	U	0.168
SZ-5	J15F81	8/14/07	0.085	U	0.085	0.098	U	0.098	0.085	U	0.085	0.084	U	0.084	0.244	U	0.244
SZ-6	J15F82	8/14/07	0.077	U	0.077	0.053	U	0.053	0.045	U	0.045	0.059	U	0.059	0.144	U	0.144
SZ-7	J15F83	8/16/07	0.266	U	0.266	0.060	U	0.060	0.058	U	0.058	0.058	U	0.058	0.126	U	0.126
SZ-7 Dup	J15F84	8/16/07	0.064	U	0.064	0.071	U	0.071	0.055	U	0.055	0.053	U	0.053	0.148	U	0.148
SZ-8	J15F85	8/16/07	0.079	U	0.079	0.090	U	0.090	0.086	U	0.086	0.082	U	0.082	0.218	U	0.218
SZ-9	J15F86	8/16/07	0.314	U	0.314	0.079	U	0.079	0.141	U	0.141	0.065	U	0.065	0.200	U	0.200
SZ-10	J15F87	8/16/07	0.293	U	0.293	0.075	U	0.075	0.061	U	0.061	0.075	U	0.075	0.155	U	0.155

Sample Location	HEIS Number	Sample Date	Europium-154			Europium-155			Nickel-63			Potassium-40			Radium-226		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.440	U	0.440	0.100	U	0.100	-0.536	U	3.700	12.4		1.60	0.390		0.190
RC-BCL-2	J14CB8	1/22/07	0.280	U	0.280	0.170	U	0.170	-0.166	U	3.700	10.6		0.790	0.450		0.140
RC-1	J14CB9	1/22/07	0.160	U	0.160	0.120	U	0.120	-0.671	U	3.700	12.3		0.490	0.429		0.110
RC-2	J14CC0	1/22/07	0.450	U	0.450	0.100	U	0.100	0.082	U	3.600	14.1		1.60	0.292		0.200
RC-3	J14CC1	1/23/07	0.300	U	0.300	0.080	U	0.080	0.085	U	3.700	11.2		1.00	0.525		0.140
RC-4	J14CC2	1/23/07	0.210	U	0.210	0.110	U	0.110	1.29	U	3.700	10.4		0.480	0.382		0.120
BCL-A	J15F73	8/14/07	0.178	U	0.178	0.134	U	0.134				13.2		0.745	0.457		0.120
BCL-B	J15F74	8/14/07	0.260	U	0.260	0.159	U	0.159				14.2		0.421	0.454		0.155
BCL-C	J15F75	8/14/07	0.270	U	0.270	0.237	U	0.237				10.7		0.794	0.466		0.167
BCL-D	J15F76	8/14/07	0.188	U	0.188	0.144	U	0.144				13.6		0.589	0.459		0.101
SZ-1	J15F77	8/14/07	0.196	U	0.196	0.169	U	0.169				10.9		0.534	0.327		0.116
SZ-2	J15F78	8/14/07	0.228	U	0.228	0.141	U	0.141				13.3		0.660	0.586		0.120
SZ-3	J15F79	8/14/07	0.077	U	0.077	0.053	U	0.053				12.6		0.259	0.510		0.048
SZ-4	J15F80	8/14/07	0.225	U	0.225	0.153	U	0.153				10.3		0.659	0.329		0.134
SZ-5	J15F81	8/14/07	0.258	U	0.258	0.196	U	0.196				8.97		0.693	0.293		0.146
SZ-6	J15F82	8/14/07	0.197	U	0.197	0.130	U	0.130				12.2		0.626	0.440		0.099
SZ-7	J15F83	8/16/07	0.187	U	0.187	0.126	U	0.126				11.7		0.550	0.488		0.103
SZ-7 Dup	J15F84	8/16/07	0.196	U	0.196	0.124	U	0.124				12.8		0.569	0.522		0.123
SZ-8	J15F85	8/16/07	0.253	U	0.253	0.173	U	0.173				8.31		0.677	0.224	U	0.224
SZ-9	J15F86	8/16/07	0.230	U	0.230	0.197	U	0.197				10.9		0.760	0.456		0.150
SZ-10	J15F87	8/16/07	0.227	U	0.227	0.158	U	0.158				12.6		0.432	0.348		0.121

Sample Location	HEIS Number	Sample Date	Radium-228			Silver-108 metastable			Thorium-228			Thorium-232			Strontium (total)		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.750	U	0.750	0.053	U	0.053	0.331		0.078	0.750	U	0.750	0.058	U	0.320
RC-BCL-2	J14CB8	1/22/07	0.767		0.340	0.047	U	0.047	0.503		0.073	0.767		0.340	0.003	U	0.310
RC-1	J14CB9	1/22/07	0.633		0.210	0.037	U	0.037	0.470		0.057	0.633		0.210	0.019	U	0.330
RC-2	J14CC0	1/22/07	1.20		0.560	0.054	U	0.054	0.253		0.084	1.20		0.560	-0.096	U	0.280
RC-3	J14CC1	1/23/07	0.660	U	0.660	0.044	U	0.044	0.339		0.065	0.660	U	0.660	0.073	U	0.240
RC-4	J14CC2	1/23/07	0.549		0.190	0.036	U	0.036	0.522		0.098	0.549		0.190	-0.028	U	0.260
BCL-A	J15F73	8/14/07	0.677		0.226	0.043	U	0.043	0.661		0.070	0.677		0.226			
BCL-B	J15F74	8/14/07	0.769		0.330	0.051	U	0.051	0.669		0.092	0.769		0.330			
BCL-C	J15F75	8/14/07	0.679		0.373	0.058	U	0.058	0.662		0.172	0.679		0.373			
BCL-D	J15F76	8/14/07	0.677		0.324	0.049	U	0.049	0.575		0.083	0.677		0.324			
SZ-1	J15F77	8/14/07	0.537		0.278	0.048	U	0.048	0.553		0.079	0.537		0.278			
SZ-2	J15F78	8/14/07	1.02		0.257	0.048	U	0.048	0.658		0.085	1.02		0.257			
SZ-3	J15F79	8/14/07	0.679		0.102	0.017	U	0.017	0.598		0.027	0.679		0.102			
SZ-4	J15F80	8/14/07	0.692		0.362	0.051	U	0.051	0.569		0.126	0.692		0.362			
SZ-5	J15F81	8/14/07	0.463		0.327	0.063	U	0.063	0.355		0.118	0.463		0.327			
SZ-6	J15F82	8/14/07	0.564		0.226	0.039	U	0.039	0.547		0.067	0.564		0.226			
SZ-7	J15F83	8/16/07	0.622		0.271	0.041	U	0.041	0.612		0.104	0.622		0.271			
SZ-7 Dup	J15F84	8/16/07	0.730		0.188	0.044	U	0.044	0.618		0.071	0.730		0.188			
SZ-8	J15F85	8/16/07	0.513		0.317	0.060	U	0.060	0.635		0.150	0.513		0.317			
SZ-9	J15F86	8/16/07	0.944		0.256	0.056	U	0.056	0.586		0.138	0.944		0.256			
SZ-10	J15F87	8/16/07	0.503		0.292	0.050	U	0.050	0.525		0.076	0.503		0.292			

Table D-1. 100-F-26:10 Radionuclide Data Results. (2 Pages)

Sample Location	HEIS Number	Sample Date	Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.150	U	0.150	14.0	U	14.0
RC-BCL-2	J14CB8	1/22/07	0.250	U	0.250	8.90	U	8.90
RC-1	J14CB9	1/22/07	0.210	U	0.210	5.90	U	5.90
RC-2	J14CC0	1/22/07	0.160	U	0.160	14.0	U	14.0
RC-3	J14CC1	1/23/07	0.120	U	0.120	11.0	U	11.0
RC-4	J14CC2	1/23/07	0.190	U	0.190	6.30	U	6.30
BCL-A	J15F73	8/14/07	0.223	U	0.223	6.13	U	6.13
BCL-B	J15F74	8/14/07	0.275	U	0.275	8.09	U	8.09
BCL-C	J15F75	8/14/07	0.346	U	0.346	10.5	U	10.5
BCL-D	J15F76	8/14/07	0.246	U	0.246	7.31	U	7.31
SZ-1	J15F77	8/14/07	0.258	U	0.258	7.34	U	7.34
SZ-2	J15F78	8/14/07	0.250	U	0.250	7.25	U	7.25
SZ-3	J15F79	8/14/07	0.091	U	0.091	2.68	U	2.68
SZ-4	J15F80	8/14/07	0.250	U	0.250	7.93	U	7.93
SZ-5	J15F81	8/14/07	0.336	U	0.336	9.93	U	9.93
SZ-6	J15F82	8/14/07	0.208	U	0.208	6.35	U	6.35
SZ-7	J15F83	8/16/07	0.218	U	0.218	7.11	U	7.11
SZ-7 Dup	J15F84	8/16/07	0.230	U	0.230	6.56	U	6.56
SZ-8	J15F85	8/16/07	0.302	U	0.302	10.1	U	10.1
SZ-9	J15F86	8/16/07	0.305	U	0.305	7.96	U	7.96
SZ-10	J15F87	8/16/07	0.244	U	0.244	8.40	U	8.40

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

B = blank contamination (organics)
BCL = below cleanup level
C = blank contamination (inorganics)
D = diluted
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
J = estimated
MDA = minimum detectable activity
PQL = practical quantitation limit
Q = qualifier
RC = road crossing
SZ = shallow zone
U = undetected
X = inteference

Table D-2. 100-F-26:10 Inorganic Data Results. (2 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
RC-BCL-1	J14CB7	1/22/07	4800		6.2	0.73	UJ	0.79	8.5		0.9	54.1	C	0.03	0.29		0.03
RC-BCL-2	J14CB8	1/22/07	4630		6.2	0.73	UJ	0.73	7.1		0.9	48.0	C	0.03	0.23		0.03
RC-1	J14CB9	1/22/07	3890		6.1	0.72	UJ	0.72	2.4		0.9	53.0	C	0.03	0.16		0.03
RC-2	J14CC0	1/22/07	4360		6.1	0.72	UJ	0.72	2.6		0.9	34.4	C	0.03	0.16		0.03
RC-3	J14CC1	1/23/07	3650		6.1	0.73	U	0.73	2.4		0.9	31.6	C	0.03	0.14		0.03
RC-4	J14CC2	1/23/07	3510		6.1	0.72	U	0.72	1.6		0.9	27.8	C	0.03	0.19		0.03
BCL-A	J15F73	8/14/07	5910	C	4.8	0.73	C	0.63	2.3		1.2	68.7	C	0.06	0.27		0.03
BCL-B	J15F74	8/14/07	6690	C	4.9	0.65	U	0.65	3.7		1.2	66.0	C	0.06	0.27		0.03
BCL-C	J15F75	8/14/07	7510	C	4.7	0.88	C	0.63	4.7		1.2	117	C	0.06	0.28		0.03
BCL-D	J15F76	8/14/07	5950	C	4.8	0.72	C	0.63	2.6		1.2	50.6	C	0.06	0.23		0.03
SZ-1	J15F77	8/14/07	7020	C	4.9	1.00	C	0.65	6.4		1.2	61.2	C	0.06	0.30		0.03
SZ-2	J15F78	8/14/07	7290		4.9	0.64	U	0.64	3.7		1.2	78.5	C	0.06	0.03	U	0.03
SZ-3	J15F79	8/14/07	5530		4.8	0.64	U	0.64	2.9		1.2	55.9	C	0.06	0.03	U	0.03
SZ-4	J15F80	8/14/07	5910		4.9	0.79		0.65	2.2		1.2	55.0	C	0.06	0.03	U	0.03
SZ-5	J15F81	8/14/07	4770		4.9	0.66	U	0.66	1.5		1.2	38.7	C	0.06	0.03	U	0.03
SZ-6	J15F82	8/14/07	5830		5.0	0.66	U	0.66	3.2		1.2	67.7	C	0.06	0.03	U	0.03
SZ-7	J15F83	8/16/07	6310		4.6	0.61	U	0.61	4.0		1.1	68.0	C	0.06	0.31		0.03
SZ-7 Dup	J15F84	8/16/07	5970		4.8	0.64	U	0.64	3.9		1.2	72.3	C	0.06	0.32		0.03
SZ-8	J15F85	8/16/07	4110		4.7	0.62	U	0.62	3.0		1.2	28.9	C	0.06	0.21		0.03
SZ-9	J15F86	8/16/07	6140		4.8	0.64	U	0.64	3.7		1.2	87.5	C	0.06	0.35		0.03
SZ-10	J15F87	8/16/07	4820		4.5	0.60	U	0.60	2.9		1.1	39.8	C	0.05	0.25		0.03

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium (total)			Hexavalent		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.6	CUJ	0.6	0.09	UC	0.09	3980	C	3.6	7.5	C	0.35	0.21	U	0.21
RC-BCL-2	J14CB8	1/22/07	1.1	CUJ	0.6	0.11	CUJ	0.09	3970	C	3.7	7.2	C	0.35	0.21	U	0.21
RC-1	J14CB9	1/22/07	0.6	UC	0.6	0.12	CUJ	0.09	4340	C	3.6	7.4	C	0.35	0.25		0.21
RC-2	J14CC0	1/22/07	0.6	UC	0.6	0.15	CUJ	0.09	4000	C	3.6	7.8	C	0.35	0.32		0.21
RC-3	J14CC1	1/23/07	0.6	UC	0.6	0.10	C	0.09	2640	C	3.6	7.1	C	0.35	0.21	U	0.21
RC-4	J14CC2	1/23/07	0.6	UC	0.6	0.09	UC	0.09	3330	C	3.6	7.0	C	0.35	0.30		0.21
BCL-A	J15F73	8/14/07	4.0		1.0	0.14	U	0.14	4930	C	2.0	8.3	C	0.29	0.27		0.20
BCL-B	J15F74	8/14/07	1.1	U	1.1	0.15	U	0.15	3990	C	2.1	9.9	C	0.29	0.20	U	0.20
BCL-C	J15F75	8/14/07	5.8		1.0	0.14	U	0.14	8460	C	2.0	10.7	C	0.29	0.20	U	0.20
BCL-D	J15F76	8/14/07	2.4		1.0	0.14	U	0.14	3740	C	2.0	8.8	C	0.29	0.20	U	0.20
SZ-1	J15F77	8/14/07	2.5		1.1	0.15	U	0.15	4300	C	2.1	10.7	C	0.30	0.27		0.20
SZ-2	J15F78	8/14/07	1.6		1.1	0.15	U	0.15	4130	C	2.1	10.1	C	0.29	0.26		0.20
SZ-3	J15F79	8/14/07	1.3		1.0	0.14	U	0.14	3650	C	2.1	7.8	C	0.29	0.20	U	0.20
SZ-4	J15F80	8/14/07	1.8		1.1	0.15	U	0.15	3660	C	2.1	8.7	C	0.30	0.28		0.20
SZ-5	J15F81	8/14/07	1.1	U	1.1	0.15	U	0.15	3300	C	2.1	7.9	C	0.30	0.27		0.20
SZ-6	J15F82	8/14/07	2.4		1.1	0.15	U	0.15	3880	C	2.1	8.5	C	0.30	0.20	U	0.20
SZ-7	J15F83	8/16/07	3.4		1.0	0.14	U	0.14	5160	C	2.0	10.1	C	0.28	0.20	U	0.20
SZ-7 Dup	J15F84	8/16/07	3.6		1.1	0.15	U	0.15	5050	C	2.1	9.2	C	0.29	0.20	U	0.20
SZ-8	J15F85	8/16/07	1.0	U	1.0	0.14	U	0.14	3000	C	2.0	8.3	C	0.28	0.24		0.20
SZ-9	J15F86	8/16/07	4.3		1.0	0.15	U	0.15	4590	C	2.1	9.5	C	0.29	0.27		0.20
SZ-10	J15F87	8/16/07	0.98	U	0.98	0.14	U	0.14	6200	C	1.9	9.0	C	0.27	0.26		0.20

Sample Location	HEIS Number	Sample Date	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
RC-BCL-1	J14CB7	1/22/07	5.2		0.15	11.8		0.20	12300		7.1	24.9		0.47	3180	C	1.3
RC-BCL-2	J14CB8	1/22/07	4.7		0.15	10.9		0.21	11100		7.2	19.7		0.47	3070	C	1.3
RC-1	J14CB9	1/22/07	3.8		0.14	10.8		0.20	9770		7.1	5.2		0.46	2930	C	1.2
RC-2	J14CC0	1/22/07	4.3		0.14	10.0		0.20	10900		7.0	6.3		0.46	3160	C	1.3
RC-3	J14CC1	1/23/07	4.2		0.15	12.0		0.20	12100		7.1	2.7		0.46	2840	C	1.3
RC-4	J14CC2	1/23/07	4.1		0.14	10.8		0.20	11000		7.0	2.7		0.46	2750	C	1.3
BCL-A	J15F73	8/14/07	6.1		0.23	12.0		0.26	14700	C	6.9	7.8		0.95	3690	C	2.3
BCL-B	J15F74	8/14/07	6.4		0.24	11.6		0.26	16300	C	7.0	10.7		0.97	3790	C	2.4
BCL-C	J15F75	8/14/07	6.8		0.23	15.8		0.26	16500	C	6.8	8.8		0.94	4560	C	2.3
BCL-D	J15F76	8/14/07	5.7		0.23	11.0		0.26	14600	C	6.9	4.8		0.95	3610	C	2.3
SZ-1	J15F77	8/14/07	6.6		0.24	11.9		0.27	16400	C	7.1	8.2		0.98	4060	C	2.4
SZ-2	J15F78	8/14/07	6.5		0.23	11.6		0.26	16800		7.0	9.4		0.97	3960	C	2.4
SZ-3	J15F79	8/14/07	5.1		0.23	10.7		0.26	12200		6.9	7.9		0.96	3240	C	2.3
SZ-4	J15F80	8/14/07	5.5		0.24	12.8		0.27	13600		7.1	5.4		0.97	3500	C	2.4
SZ-5	J15F81	8/14/07	4.7		0.24	9.9		0.27	12200		7.1	2.3		0.98	3260	C	2.4
SZ-6	J15F82	8/14/07	5.5		0.24	10.4		0.27	13200		7.2	7.4		0.99	3280	C	2.4
SZ-7	J15F83	8/16/07	6.3		0.22	13.2	C	0.25	15700	C	6.6	9.4		0.92	4170	C	2.3
SZ-7 Dup	J15F84	8/16/07	6.2		0.23	13.2	C	0.26	14900	C	7.0	10.1		0.96	4070	C	2.4
SZ-8	J15F85	8/16/07	4.7		0.22	11.0	C	0.25	11600	C	6.7	3.7		0.93	3140	C	2.3
SZ-9	J15F86	8/16/07	6.1		0.23	12.2	C	0.26	15600	C	7.0	12.6		0.96	3810	C	2.4
SZ-10	J15F87	8/16/07	5.2		0.22	12.6	C	0.25	12800	C	65.0	4.0		0.90	3520	C	2.2

Table D-2. 100-F-26:10 Inorganic Data Results. (2 Pages)

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
RC-BCL-1	J14CB7	1/22/07	257		0.12	0.02	U	0.02	0.47	U	0.47	8.8		0.64	964	C	6.2
RC-BCL-2	J14CB8	1/22/07	234		0.12	0.02	U	0.02	0.47	U	0.48	9.0		0.65	864	C	6.2
RC-1	J14CB9	1/22/07	215		0.12	0.02	U	0.02	0.47		0.46	9.5		0.64	587	C	6.1
RC-2	J14CC0	1/22/07	221		0.12	0.01	U	0.01	0.46	U	0.46	10.5		0.63	649	C	6.1
RC-3	J14CC1	1/23/07	197		0.12	0.02	U	0.02	0.46	U	0.46	8.5		0.64	393	C	6.2
RC-4	J14CC2	1/23/07	205		0.12	0.01	U	0.01	0.46	U	0.46	9.0		0.63	428	C	6.1
BCL-A	J15F73	8/14/07	263		0.20	0.02	U	0.02	0.46	U	0.46	10.5		0.78	1140	C	9.2
BCL-B	J15F74	8/14/07	291		0.21	0.02	U	0.02	0.47	U	0.47	10.3		0.79	1410	C	9.4
BCL-C	J15F75	8/14/07	291		0.20	0.02	U	0.02	0.46	U	0.46	12.3		0.77	1300	C	9.1
BCL-D	J15F76	8/14/07	244		0.20	0.01	U	0.01	0.46	U	0.46	9.6		0.78	1040	C	9.2
SZ-1	J15F77	8/14/07	287		0.21	0.02	U	0.02	0.48	U	0.48	11.5		0.80	1310	C	9.5
SZ-2	J15F78	8/14/07	328		0.21	0.01	U	0.01	0.64	C	0.47	11.3		0.79	1560		9.4
SZ-3	J15F79	8/14/07	247		0.20	0.01	U	0.01	0.46	U	0.46	8.9		0.78	1020		9.3
SZ-4	J15F80	8/14/07	266		0.21	0.01	U	0.01	0.48	C	0.47	9.7		0.90	1040		9.4
SZ-5	J15F81	8/14/07	211		0.21	0.01	U	0.01	0.48	U	0.48	8.9		0.80	708		9.5
SZ-6	J15F82	8/14/07	273		0.21	0.01	U	0.01	0.48	U	0.48	9.4		0.81	1150		9.6
SZ-7	J15F83	8/16/07	281	C	0.19	0.01	U	0.01	0.44	U	0.44	11.2		0.75	1020	C	8.9
SZ-7 Dup	J15F84	8/16/07	285	C	0.20	0.01	U	0.01	0.47	U	0.47	11.8		0.79	1030	C	9.3
SZ-8	J15F85	8/16/07	202	C	0.20	0.02	U	0.02	0.45	U	0.45	8.8		0.76	482	C	9.0
SZ-9	J15F86	8/16/07	292	C	0.20	0.02	U	0.02	0.47	U	0.47	10.3		0.79	1260	C	9.3
SZ-10	J15F87	8/16/07	249	C	0.19	0.01		0.01	0.44	U	0.44	10.1		0.74	788	C	8.7

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
RC-BCL-1	J14CB7	1/22/07	1.3	U	1.3	466	CJ	1.9	0.15	U	0.15	116	C	0.9	26.4		0.17
RC-BCL-2	J14CB8	1/22/07	1.3	U	1.3	743	CJ	1.9	0.15	U	0.15	120	C	0.7	21.5		0.18
RC-1	J14CB9	1/22/07	1.2	U	1.2	439	CJ	1.9	0.14	U	0.14	119	C	0.7	21.0		0.17
RC-2	J14CC0	1/22/07	1.2	U	1.2	484	CJ	1.8	0.14	U	0.14	117	C	0.7	24.6		0.17
RC-3	J14CC1	1/23/07	1.2	U	1.2	471	C	1.9	0.15	U	0.15	118	C	0.7	31.7		0.17
RC-4	J14CC2	1/23/07	1.2	U	1.2	413	C	1.8	0.14	U	0.14	102	C	0.7	26.8		0.17
BCL-A	J15F73	8/14/07	1.8		1.2	1650	C	2.5	0.26	U	0.26	171	C	2.0	32.2		0.23
BCL-B	J15F74	8/14/07	1.3	U	1.3	932	C	2.5	0.26	U	0.26	168	C	2.1	34.9		0.24
BCL-C	J15F75	8/14/07	1.2	U	1.2	1460	C	2.5	0.26	U	0.26	228	C	2.0	36.5		0.23
BCL-D	J15F76	8/14/07	1.2	U	1.2	1170	C	2.5	0.26	U	0.26	164	C	2.0	33.6		0.23
SZ-1	J15F77	8/14/07	1.5		1.3	1120	C	2.6	0.27	U	0.27	200	C	2.1	34.8		0.24
SZ-2	J15F78	8/14/07	1.3	U	1.3	1810		2.5	0.26	U	0.26	226	C	2.1	34.7		0.23
SZ-3	J15F79	8/14/07	1.2	U	1.2	2510		2.5	0.26	U	0.26	173	C	2.0	26.8		0.23
SZ-4	J15F80	8/14/07	1.3	U	1.3	2380		2.5	0.27	U	0.27	176	C	2.1	31.6		0.24
SZ-5	J15F81	8/14/07	1.3	U	1.3	1420		2.6	0.27	U	0.27	159	C	2.1	31.9		0.24
SZ-6	J15F82	8/14/07	1.3	U	1.3	2660		2.6	0.27	U	0.27	156	C	2.1	29.3		0.24
SZ-7	J15F83	8/16/07	1.3		1.2	1600	C	2.4	0.25	U	0.25	190	C	1.9	33.9		0.22
SZ-7 Dup	J15F84	8/16/07	1.3	U	1.3	1580	C	2.5	0.26	U	0.26	191	C	2.0	31.6		0.23
SZ-8	J15F85	8/16/07	1.2	U	1.2	871	C	2.4	0.25	U	0.25	80	C	2.0	28.8		0.22
SZ-9	J15F86	8/16/07	1.3	U	1.3	1510	C	2.5	0.26	U	0.26	142	C	2.0	33.4		0.22
SZ-10	J15F87	8/16/07	1.2	U	1.2	1040	C	2.4	0.25	U	0.25	94	C	1.9	29.1		0.22

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	30.5	C	0.12
RC-BCL-2	J14CB8	1/22/07	28.7	C	0.12
RC-1	J14CB9	1/22/07	40.5	C	0.12
RC-2	J14CC0	1/22/07	26.0	C	0.12
RC-3	J14CC1	1/23/07	26.0	C	0.12
RC-4	J14CC2	1/23/07	26.7	C	0.12
BCL-A	J15F73	8/14/07	44.2	C	0.12
BCL-B	J15F74	8/14/07	44.3	C	0.12
BCL-C	J15F75	8/14/07	51.9	C	0.11
BCL-D	J15F76	8/14/07	33.8	C	0.12
SZ-1	J15F77	8/14/07	38.2	C	0.12
SZ-2	J15F78	8/14/07	38.8	C	0.12
SZ-3	J15F79	8/14/07	30.7	C	0.12
SZ-4	J15F80	8/14/07	32.6	C	0.12
SZ-5	J15F81	8/14/07	26.9	C	0.12
SZ-6	J15F82	8/14/07	33.7	C	0.12
SZ-7	J15F83	8/16/07	35.1	C	0.11
SZ-7 Dup	J15F84	8/16/07	33.8	C	0.12
SZ-8	J15F85	8/16/07	27.9	C	0.11
SZ-9	J15F86	8/16/07	37.2	C	0.12
SZ-10	J15F87	8/16/07	37.2	C	0.11

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Aroclor-1016			Aroclor-1221			Aroclor-1232			Aroclor-1242			Aroclor-1248		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-BCL-2	J14CB8	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-1	J14CB9	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-2	J14CC0	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-3	J14CC1	1/23/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-4	J14CC2	1/23/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
BCL-A	J15F73	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
BCL-B	J15F74	8/14/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
BCL-C	J15F75	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
BCL-D	J15F76	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-1	J15F77	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-2	J15F78	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-3	J15F79	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-4	J15F80	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-5	J15F81	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-6	J15F82	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-7	J15F83	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-7 Dup	J15F84	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-8	J15F85	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-9	J15F86	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-10	J15F87	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13

Sample Location	HEIS Number	Sample Date	Aroclor-1254			Aroclor-1260			Aldrin			Alpha-BHC			alpha-Chlordane		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-2	J14CC0	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	14	U	14	14	U	14	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	14	U	14	14	U	14	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	8	J	13	5	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	13	U	13	4	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	13	U	13	10	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	13	U	13	4	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	13	U	13	6	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	4.0	J	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	57		13	54		13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Sample Location	HEIS Number	Sample Date	beta-1,2,3,4,5,6-Hexachlorocyclohexane			Delta-BHC			Dichlorodiphenyldichloroethane			Dichlorodiphenyldichloroethylene			Dichlorodiphenyltrichloroethane		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.5	D	1.4
RC-2	J14CC0	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Dieldrin			Endosulfan I			Endosulfan II			Endosulfan sulfate			Endrin		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-2	J14CC0	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	4.9	JD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Sample Location	HEIS Number	Sample Date	Endrin aldehyde			Endrin ketone			Gamma-BHC (Lindane)			gamma-Chlordane			Heptachlor		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-2	J14CC0	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Sample Location	HEIS Number	Sample Date	Heptachlor epoxide			Methoxychlor			Toxaphene			1,2,4-Trichlorobenzene			1,2-Dichlorobenzene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	14	UJ	14	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	3.0	D	1.4	14	UJ	14	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	1.4	UD	1.4	2.5	D	1.4	14	UJ	14	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	1.4	UD	1.4	2.9	D	1.4	14	UJ	14	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	17	U	17	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	17	U	17	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	14	UD	14	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	1.3	UD	1.3	1.7	JD X	1.7	13	UD	13	330	U	330	330	U	330

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	1,3-Dichlorobenzene			1,4-Dichlorobenzene			2,4,5-Trichlorophenol			2,4,6-Trichlorophenol			2,4-Dichlorophenol		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	860	U	860	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	840	U	840	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	2,4-Dimethylphenol			2,4-Dinitrophenol			2,4-Dinitrotoluene			2,6-Dinitrotoluene			2-Chloronaphthalene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	860	UJ	860	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	860	UJ	860	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	850	UJ	850	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	850	UJ	850	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	850	U	850	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	840	U	840	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	2-Chlorophenol			2-Methylnaphthalene			2-Methylphenol (cresol, o-)			2-Nitroaniline			2-Nitrophenol		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	860	U	860	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	840	U	840	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	3+4 Methylphenol (cresol, m+p)			3,3'-Dichlorobenzidine			3-Nitroaniline			4,6-Dinitro-2-methylphenol			4-Bromophenylphenyl ether		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	860	U	860	860	U	860	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	860	U	860	860	U	860	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	850	U	850	850	U	850	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	850	U	850	850	U	850	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	860	U	860	860	U	860	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	860	U	860	860	U	860	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	850	U	850	850	U	850	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	840	U	840	840	U	840	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330

Sample Location	HEIS Number	Sample Date	4-Chloro-3-methylphenol			4-Chloroaniline			4-Chlorophenylphenyl ether			4-Nitroaniline			4-Nitrophenol		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	860	U	860	860	U	860
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	840	U	840	840	U	840
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840

Sample Location	HEIS Number	Sample Date	Acenaphthene			Acenaphthylene			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	18	J	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	41	J	330	39	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	19	J	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene			Bis(2-chloro-1-methylethyl)ether			Bis(2-Chloroethoxy) methane		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	19	J	330	330	U	330	25	J	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	19	J	330	26	J	330	48	J	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	18	J	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	Bis(2-chloroethyl) ether			Bis(2-ethylhexyl) phthalate			Butylbenzylphthalate			Carbazole			Chrysene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	330	U	330	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	330	U	330	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	860	B	860	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	540	B	540	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	99	JB	330	330	U	330	330	U	330	23	J	330
BCL-B	J15F74	8/14/07	340	U	340	100	JB	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	250	JB	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	61	JB	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	79	JB	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	60	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	33	JB	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	42	JB	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	40	JB	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	37	JB	330	330	U	330	330	U	330	20	J	330
SZ-10	J15F87	8/16/07	330	U	330	120	JB	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	Di-n-butylphthalate			Di-n-octylphthalate			Dibenz[a,h]anthracene			Dibenzofuran			Diethylphthalate		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	39	J	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	25	J	25	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	23	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	25	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	30	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	21	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	26	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	25	JB	330	330	U	330	330	U	330	330	U	330	330	U	330

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Dimethyl phthalate			Fluoranthene			Fluorene			Hexachlorobenzene			Hexachlorobutadiene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	26	J	330	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	20	J	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	120	J	120	330	U	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	22	J	330	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	Hexachlorocyclopentadiene			Hexachloroethane			Indeno(1,2,3-cd)pyrene			Isophorone			N-Nitroso-di-n-dipropylamine		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	24	J	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	N-Nitrosodiphenylamine			Naphthalene			Nitrobenzene			Pentachlorophenol			Phenanthrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	860	U	860	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	840	U	840	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	98	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330

Table D-3. 100-F-26:10 Organic Data Results. (7 Pages)

Sample Location	HEIS Number	Sample Date	Phenol			Pyrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	35	J	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	20	J	330
BCL-D	J15F76	8/14/07	330	U	330	28	J	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	110	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	33	J	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330

APPENDIX E

CALCULATIONS

CALCULATION BRIEFS

The following calculation briefs have been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculations," Washington Closure Hanford, Richland, Washington.

100-F-26:10 Pipelines Hazard Quotient and Carcinogenic Risk Calculations, Calculation No. 0100F-CA-V0314, Rev. 0.

100-F-26:10 Pipelines Cleanup Verification 95% UCL Calculation, Calculation No. 0100F-CA-V0315, Rev. 0

Acrobat 8.0

CALCULATION COVER SHEET

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

Area: 100-F

Discipline: Environmental *Calculation No: 0100F-CA-V0314

Subject: 100-F-26:10 Pipelines 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	Total = 4	L. D. Habel	J. M. Capron	N/A	S. W. Callison	10-18-07

SUMMARY OF REVISION

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

Washington Closure Hanford CALCULATION SHEET

Originator:	L.D. Habel	Date:	10/11/07	Calc. No.:	0100F-CA-V0314	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	J. M. Capron	Date:	10/11/07
Subject:	100-F-26:10 Pipelines Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 3	

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and carcinogenic (excess cancer) risk values for the 100-F-26:10 pipelines site remedial action. 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, 2007, *100-F-26:10 Pipelines Cleanup Verification 95% UCL Calculation*, 0100F-CA-V0315, Washington Closure Hanford, Richland, Washington.

4) 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.

SOLUTION:

1) Calculate an HQ for each noncarcinogenic constituent detected above background and compare it 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 it 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 $<1 \times 10^{-5}$.

Washington Closure Hanford		CALCULATION SHEET					
Originator:	L.D. Habel	Date:	10/11/07	Calc. No.:	0100F-CA-V0314	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	J. M. Capron	Date:	10/11/07
Subject:	100-F-26:10 Pipelines Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 3	

METHODOLOGY:

Hazard quotient and carcinogenic risk calculations were conservatively calculated for the entire 100-F-26:10 waste site using the maximum of the statistically determined or focused sample values for each analyte in all sampling areas (WCH 2007). Of the nonradionuclide contaminants of concern (COC) lead and selenium were the only analytes that required the HQ and risk calculations because they were quantified above background. Additionally, boron, hexavalent chromium, molybdenum, and multiple organics (as listed in Table 1) required the HQ and risk calculations because these COCs were detected and a Washington State or Hanford Site background value is not available. All other site nonradionuclide COCs were not detected or were quantified below background levels. Arsenic was detected above the Hanford Site background value but below the WAC 173-340 Method A cleanup level. Due to the intent of Method A cleanup values and the allowance to use such values for arsenic (DOE-RL 2005), arsenic has been excluded from the Method B individual analyte and cumulative risk requirements. All other site nonradionuclide COCs and COPCs were not detected or were detected below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the maximum result for hexavalent chromium (0.32 mg/kg), divided by the noncarcinogenic RAG value of 240 mg/kg (calculated in accordance with the noncarcinogenic toxic effects WAC 173-340-740[3]), is 1.3×10^{-3}. 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 1.2×10^{-1}. Comparing this values to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum statistical value is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6}. For example, the maximum value for aroclor-1254 is 0.057 mg/kg; divided by 0.5 mg/kg, and multiplied as indicated, is 1.1×10^{-7}. Comparing this value to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk is obtained by summing the individual values. The sum of the excess cancer risk values is 2.0×10^{-6}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

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

Table 1 shows the results of the calculation.

Washington Closure Hanford CALCULATION SHEET

Originator:	L.D. Habel	Date:	10/11/07	Calc. No.:	0100F-CA-V0314	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	J. M. Capron	Date:	10/11/07
Subject:	100-F-26:10 Pipelines Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 3	

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 100-F-26:10 Waste Site.

Contaminants of Potential Concern	Statistical Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Metals					
Boron	5.8	16,000	3.6E-04	--	--
Chromium, hexavalent[c]	0.32	240	1.3E-03	2.1	1.5E-07
Lead[d]	24.9	353	7.1E-02	--	--
Molybdenum	0.64	400	1.6E-03	--	--
Selenium	1.8	400	4.5E-03	--	--
Semivolatiles					
Benzo(a)anthracene	0.041	--	--	0.137	3.0E-07
Benzo(a)pyrene	0.039	--	--	0.137	2.8E-07
Benzo(b)fluoranthene	0.019	--	--	0.137	1.4E-07
Benzo(k)fluoranthene	0.048	--	--	0.137	3.5E-07
Benzo(ghi)perylene	0.026	2,400	1.1E-05	--	--
Bis(2-ethylhexyl) phthalate	0.860	1,600	5.4E-04	71.4	1.2E-08
Chrysene	0.060	--	--	0.137	4.4E-07
Di-n-butylphthalate	0.340	8,000	4.3E-05	--	--
Fluoranthene	0.120	3,200	3.8E-05	--	--
Indeno(1,2,3-cd) pyrene	0.024	--	--	1.37	1.8E-08
Phenanthrene[e]	0.098	24,000	4.1E-06	--	--
Pyrene	0.330	2,400	1.4E-04	--	--
Pesticides					
DDT, 4,4'-	0.0015	40	3.8E-05	2.94	5.1E-10
Dieldrin	0.005	4	1.3E-03	0.0625	8.0E-08
Methoxychlor	0.003	400	7.5E-06	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.057	1.6	3.6E-02	0.5	1.1E-07
Aroclor-1260	0.054	--	--	0.5	1.1E-07
Totals					
Cumulative Hazard Quotient:			**1.2E-01**		
Cumulative Excess Cancer Risk:					**2.0E-06**

Notes:
RAG = remedial action goal
-- = not applicable
[a] = From Calculation No. 0100F-CA-V0315 (WCH 2007).
[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 noncarcinogenic RAG obtained from EPA (1994).
[e] = Toxicity data for this chemical are not available. RAGs for benzo(g,h,i)perylene are based on the surrogate chemical pyrene.

CONCLUSION:

This calculation demonstrates that the 100-F-26:10 waste site meets the requirements for the hazard quotients and carcinogenic (excess cancer) risk as identified in the RDR/RAWP (DOE-RL 2005).

Acrobat 8.0

CALCULATION COVER SHEET

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

Area: 100-F

Discipline: Environmental *Calculation No: 0100F-CA-V0315

Subject: 100-F-26:10 Pipelines Cleanup Verification 95% UCL Calculation

Computer Program: Excel Program No: Excel 2003

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

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Total = 23	L. D. Habel	J. M. Capron	N/A	S. W. Callison	10-18-07

SUMMARY OF REVISION

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

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel LDH **Date** 10/11/07 **Calc. No.** 0100F-CA-V0315 **Rev. No.** 0
Project 100-F Field Remediation **Job No.** 14655 **Checked** J. M. Capron JMC **Date** 10/11/07
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation **Sheet No.** 1 of 11

Summary

Purpose:
Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the shallow zone excavation of the subject site. Also, perform the Washington Administrative Code (WAC) 173-340-740(7)(e) 3-part test for nonradionuclide contaminants of concern (COCs) and contaminants of potential concern (COPCs) and calculate the relative percent difference (RPD) for primary-duplicate sample pairs, as necessary.

Table of Contents:

Given/References:
1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are from DOE-RL (2005b), DOE-RL (2001), and Ecology (2005).
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, 2005, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
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 publication #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 primary-duplicate sample pairs, 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. 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 L. D. Habel	**Date** 10/11/07	**Calc. No.** 0100F-CA-V0315	**Rev. No.** 0
Project 100-F Field Remediation	**Job No.** 14655	**Checked** J. M. Capron	**Date** 10/11/07
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation			**Sheet No.** 2 of 11

Summary (continued)

UCL Methodology:

For nonradioactive analytes with ≤50% of the data below detection limits and all detected 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 95% UCL is not calculated for data sets with no reported detections. The evaluation of the portion of each analyte's data set below detection limits was performed by direct inspection of the attached sample results, and no further calculations were performed for those data sets where >50% of the data was below detection limits.

Calculated cleanup levels are not available in Ecology (2005) under WAC 173-340-740(3) for:

aluminum, calcium, iron, magnesium, potassium, silicon, and sodium;

therefore, these constituents are not considered site COPCs and are also not included in these tables.

The 95% UCL values were not calculated for radium-226, radium-228, thorium-228, thorium-232, and potassium-40, as these isotopes are excluded from consideration as COCs based on natural occurrence and analogous site information.

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

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets ($n < 10$) 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 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 input 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,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC.

The WAC 173-340-740(7)(e) 3-part test is not performed for COPCs where the statistical value defaults to the maximum value in the data set. Instead, direct comparison of the maximum value against site remedial action goals (RAGs) (within the RSVP) is used as the compliance basis.

The RPD values are evaluated for analytes detected in a primary-duplicate or primary-split sample pair for the purposes of data quality assessment within the CVP. The RPD is calculated when both the primary value and the duplicate value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The 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 1994b). If the RPD is greater than 30% (or 35% for regulatory split data), further investigation regarding the usability of the data is performed. To assist in the identification of anomalous sample pairs, when an analyte is detected in the primary or duplicate/split sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate/split results exceed a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion is provided in the data quality assessment section of the applicable CVP, as necessary.

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel LH Date 10/11/07 Calc. No. 0100F-CA-V0315 Rev. No. 0
Project 100-F Field Remediation Job No. 14655 Checked J. M. Capron JMC Date 10/11/07
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation Sheet No. 3 of 11

Summary (continued)

Methodology (continued):
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.

Results:

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

Results Summary[a] - Remediation Footprint

Analyte	Excavation Shallow Zone[b]	OB-BCL[b]	Road Crossing[c]	Units
Antimony	1.0	0.88	--	mg/kg
Arsenic	4.4	4.7	8.5	mg/kg
Barium	74.6	117	54	mg/kg
Beryllium	0.23	0.28	0.29	mg/kg
Boron	4.2	5.8	1.6	mg/kg
Cadmium	--	--	0.15	mg/kg
Chromium	9.6	10.7	7.8	mg/kg
Hexavalent Chromium	0.26	0.27	0.32	mg/kg
Cobalt	6.1	6.8	5.2	mg/kg
Copper	12.3	15.8	12.0	mg/kg
Lead	10.8	10.7	24.9	mg/kg
Manganese	289	291	257	mg/kg
Mercury	0.01	--	--	mg/kg
Molybdenum	0.64	--	0.47	mg/kg
Nickel	10.7	12.3	10.5	mg/kg
Selenium	1.5	1.8	--	mg/kg
Vanadium	33.0	36.5	31.7	mg/kg
Zinc	36.6	51.9	40.5	mg/kg
Aroclor-1254	57	8	--	ug/kg
Aroclor-1260	54	10	--	ug/kg
Benzo(a)anthracene	41	--	--	ug/kg
Benzo(a)pyrene	39	18	--	ug/kg
Benzo(b)fluoranthene	19	19	--	ug/kg
Benzo(ghi)perylene	26	--	--	ug/kg
Benzo(k)fluoranthene	48	25	--	ug/kg
Bis(2-ethylhexyl) phthalate	145	250	860	ug/kg
Chrysene	60	23	--	ug/kg
Dichlorodiphenyltrichloro-ethane	--	--	1.5	ug/kg
Dieldrin	4.9	--	--	ug/kg
Di-n-butylphthalate	26	340	39	ug/kg
Fluoranthene	120	26	--	ug/kg
Indeno(1,2,3-cd)pyrene	24	--	--	ug/kg
Methoxychlor	1.7	--	3.0	ug/kg
Phenanthrene	98	--	--	ug/kg
Pyrene	110	330	--	ug/kg

[a]No detections were reported in any data set for COCs/COPCs not listed in this table.
[b]Maximum or 95% UCL result, depending on data censorship, as described in the calculation methodology.
[c]Road crossing (and related backfill) samples were collected, analyzed and the data evaluated previously. Data is presented here for data completeness.

BCL = below cleanup levels
COC = contaminant of concern
COPC = contaminant of potential concern
ND = not detected (for all samples in the data set)

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel Date 10/11/07 Calc. No. 0100F-CA-V0315 Rev. No. 0
Project 100-F Field Remediation Job No. 14655 Checked J. M. Capron Date 10/11/07
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation Sheet No. 4 of 11

Summary (continued)

Excavation Shallow Zone - WAC 173-340 3-Part Test for most stringent RAG:

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

Because of the "yes" answers to the WAC 173-340 3-part test for lead, additional evaluation of the attainment of cleanup criteria will be performed.

OB/BCL - WAC 173-340 3-Part Test for most stringent RAG:

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

Because of the "yes" answers to the WAC 173-340 3-part test for lead, additional evaluation of the attainment of cleanup criteria will be performed.

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

Analyte	Excavation Shallow Zone Duplicate Analysis[b]
Potassium-40	9%
Aluminum	6%
Barium	6%
Calcium	2%
Chromium	9%
Copper	0%
Iron	5%
Magnesium	2%
Manganese	1%
Silicon	1%
Vanadium	7%
Zinc	4%

[a]Relative percent difference evaluation was not required for analytes not included in this table.
[b]The significance of relative percent difference values are discussed within the RSVP for the subject site.
-- = analysis not required
QA/QC = quality assurance/quality control
RSVP = remaining sites verification package

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation

Date 10/11/07
Job No. 14655

Calc. No. 0100F-CA-V0315
Checked J. M. Capron

Rev. No. 0
Date 10/11/07
Sheet No. 5 of 11

100-F-26:14 Excavation Shallow Zone Statistical Calculations

Verification Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Hexavalent Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL
SZ-7	J15F83	8/16/07	4.0		1.1	68.0	C	0.06	0.31		0.03	3.4		1.0	10.1	C	0.28	0.20	U	0.20	6.3		0.22	13.2	C	0.25
SZ-7 Dup	J15F84	8/16/07	3.9		1.2	72.3	C	0.06	0.32		0.03	3.6		1.1	9.2	C	0.29	0.20	U	0.20	6.2		0.23	13.2	C	0.26
SZ-1	J15F77	8/14/07	6.4		1.2	61.2	C	0.06	0.30		0.03	2.5		1.1	10.7	C	0.30	0.27		0.20	6.6		0.24	11.9		0.27
SZ-2	J15F78	8/14/07	3.7		1.2	78.5	C	0.06	0.03	U	0.03	1.6		1.1	10.1	C	0.29	0.26		0.20	6.5		0.23	11.6		0.26
SZ-3	J15F79	8/14/07	2.9		1.2	55.9	C	0.06	0.03	U	0.03	1.3		1.0	7.8	C	0.29	0.20	U	0.20	5.1		0.23	10.7		0.26
SZ-4	J15F80	8/14/07	2.2		1.2	55.0	C	0.06	0.03	U	0.03	1.8		1.1	8.7	C	0.30	0.28		0.20	5.5		0.24	12.8		0.27
SZ-5	J15F81	8/14/07	1.5		1.2	38.7	C	0.06	0.03	U	0.03	1.1	U	1.1	7.9	C	0.30	0.27		0.20	4.7		0.24	9.9		0.27
SZ-6	J15F82	8/14/07	3.2		1.2	67.7	C	0.06	0.03	U	0.03	2.4		1.1	8.5	C	0.30	0.20	U	0.20	5.5		0.24	10.4		0.27
SZ-8	J15F85	8/16/07	3.0		1.2	28.9	C	0.06	0.21		0.03	1.0	U	1.0	8.3	C	0.28	0.24		0.20	4.7		0.22	11.0	C	0.25
SZ-9	J15F86	8/16/07	3.7		1.2	87.5	C	0.06	0.35		0.03	4.3		1.0	9.5	C	0.29	0.27		0.20	6.1		0.23	12.2	C	0.26
SZ-10	J15F87	8/16/07	2.9		1.1	39.8	C	0.05	0.25		0.03	0.98	U	0.98	9.0	C	0.27	0.26		0.20	5.2		0.22	12.6	C	0.25

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg			Barium mg/kg			Beryllium mg/kg			Boron mg/kg			Chromium mg/kg			Hexavalent Chromium mg/kg			Cobalt mg/kg			Copper mg/kg		
SZ-7	J15F83/J15F84	8/16/07	4.0			70.2			0.32			3.5			9.7			0.10			6.3			13.2		
SZ-1	J15F77	8/14/07	6.4			61.2			0.30			2.5			10.7			0.27			6.6			11.9		
SZ-2	J15F78	8/14/07	3.7			78.5			0.02			1.6			10.1			0.26			6.5			11.6		
SZ-3	J15F79	8/14/07	2.9			55.9			0.02			1.3			7.8			0.10			5.1			10.7		
SZ-4	J15F80	8/14/07	2.2			55.0			0.02			1.8			8.7			0.28			5.5			12.8		
SZ-5	J15F81	8/14/07	1.5			38.7			0.02			0.55			7.9			0.27			4.7			9.9		
SZ-6	J15F82	8/14/07	3.2			67.7			0.02			2.4			8.5			0.10			5.5			10.4		
SZ-8	J15F85	8/16/07	3.0			28.9			0.21			0.50			8.3			0.24			4.7			11.0		
SZ-9	J15F86	8/16/07	3.7			87.5			0.35			4.3			9.5			0.27			6.1			12.2		
SZ-10	J15F87	8/16/07	2.9			39.8			0.25			0.49			9.0			0.26			5.2			12.6		

Statistical Computations

	Arsenic	Barium	Beryllium	Boron	Chromium	Hexavalent Chromium	Cobalt	Copper
95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.	Large data set (n ≥10), use MTCAStat lognormal distribution.	Large data set (n ≥10), use MTCAStat lognormal distribution.
N	10	10	10	10	10	10	10	10
% < Detection limit	0%	0%	50%	30%	0%	30%	0%	0%
Mean	3.3	58.3	0.15	1.9	9.0	0.22	5.6	11.6
Standard deviation	1.3	18.6	0.15	1.3	1.0	0.08	0.71	1.1
95% UCL on mean	4.4	74.6	0.23	4.2	9.6	0.26	6.1	12.3
Maximum detected value	6.4	87.5	0.35	4.3	10.7	0.28	6.6	13.2
Final Statistical Value	4.4	74.6	0.23	4.2	9.6	0.26	6.1	12.3
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 Direct Exposure/GW & River Protection	132 GW Protection	1.51 GW & River Protection	320 GW Protection	18.5 GW & River Protection	2 River Protection	32 GW Protection	22.0 River Protection
WAC 173-340 3-PART TEST								
95% UCL > Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
> 10% above Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
Any sample > 2X Cleanup Limit?	NO	NO	NO	NO	NO	NO	NO	NO
WAC 173-340 Compliance? Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation

Date 10/11/07
Job No. 14655

Calc. No. 0100F-CA-V0315
Checked J. M. Capron

Rev. No. 0
Date 10/11/07
Sheet No. 6 of 11

1 100-F-26:14 Excavation Shallow Zone Statistical Calculations
2 Verification Data

3	Sample	Sample	Sample	Lead			Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
5	SZ-7	J15F83	8/16/07	9.4		0.92	281	C	0.19	11.2		0.75	33.9		0.22	35.1	C	0.11	33	JB	330
6	SZ-7 Dup	J15F84	8/16/07	10.1		0.96	285	C	0.20	11.8		0.79	31.6		0.23	33.8	C	0.12	42	JB	330
7	SZ-1	J15F77	8/14/07	8.2		0.98	287		0.21	11.5		0.80	34.8		0.24	38.2	C	0.12	79	JB	330
8	SZ-2	J15F78	8/14/07	9.4		0.97	326		0.21	11.3		0.79	34.7		0.23	38.8	C	0.12	340	U	340
9	SZ-3	J15F79	8/14/07	7.9		0.96	247		0.20	8.9		0.78	23.8		0.23	30.7	C	0.12	330	U	330
10	SZ-4	J15F80	8/14/07	5.4		0.97	266		0.21	9.7		0.80	31.6		0.24	32.6	C	0.12	330	U	330
11	SZ-5	J15F81	8/14/07	2.3		0.98	211		0.21	8.9		0.80	31.9		0.24	26.9	C	0.12	330	U	330
12	SZ-6	J15F82	8/14/07	7.4		0.99	275		0.21	9.4		0.81	29.3		0.24	33.7	C	0.12	330	U	330
13	SZ-8	J15F85	8/16/07	3.7		0.93	202	C	0.20	8.8		0.76	28.8		0.22	27.9	C	0.11	40	JB	330
14	SZ-9	J15F86	8/16/07	12.6		0.96	292	C	0.20	10.3		0.79	33.4		0.22	37.2	C	0.12	37	JB	330
15	SZ-10	J15F87	8/16/07	4.0		0.90	249	C	0.19	10.1		0.74	29.1		0.22	37.2	C	0.11	120	JB	330

16 Statistical Computation Input Data

17	Sample	Sample	Sample	Lead			Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
18	Area	Number	Date	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			ug/kg		
19	SZ-7	J15F83/J15F84	8/16/07	9.8			283			11.5			32.8			34.5			38		
20	SZ-1	J15F77	8/14/07	8.2			287			11.5			34.8			38.2			79		
21	SZ-2	J15F78	8/14/07	9.4			326			11.3			34.7			38.8			170		
22	SZ-3	J15F79	8/14/07	7.9			247			8.9			23.8			30.7			165		
23	SZ-4	J15F80	8/14/07	5.4			266			9.7			31.6			32.6			165		
24	SZ-5	J15F81	8/14/07	2.3			211			8.9			31.9			26.9			165		
25	SZ-6	J15F82	8/14/07	7.4			275			9.4			29.3			33.7			165		
26	SZ-8	J15F85	8/15/07	3.7			202			8.8			28.8			27.9			40		
27	SZ-9	J15F86	8/16/07	12.6			292			10.3			33.4			37.2			37		
28	SZ-10	J15F87	8/16/07	4.0			249			10.1			29.1			37.2			120		

29 Statistical Computations

30		Lead		Manganese		Nickel		Vanadium		Zinc		Bis(2-ethylhexyl) phthalate	
31	95% UCL based on	Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.		Large data set (n ≥10), use MTCAStat lognormal distribution.	
32	N	10		10		10		10		10		10	
33	% < Detection limit	0%		0%		0%		0%		0%		50%	
34	Mean	7.1		264		10.0		31.3		33.8		114	
35	Standard deviation	3.2		36		1.1		2.7		4.2		60	
36	95% UCL on mean	10.8		289		10.7		33.0		36.6		145	
37	Maximum detected value	12.6		323		11.8		34.8		38.8		120	
38	Final Statistical Value	10.8		289		10.7		33.0		36.6		145	
	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	10.2	GW & River Protection	512	GW & River Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection	0.36	River Protection
	WAC 173-340 3-PART TEST												
	95% UCL > Cleanup Limit?	YES		NO		NO		NO		NO		NO	
	> 10% above Cleanup Limit?	NO		NO		NO		NO		NO		NO	
	Any sample > 2X Cleanup Limit?	NO		NO		NO		NO		NO		NO	
	WAC 173-340 Compliance? Further Assessment Required	A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.		Yes		Yes		Yes		Yes		Yes	

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation

Date 10/11/07 | Job No. 14655 | Calc. No. 0100F-CA-V0315 | Checked J. M. Capron

Rev. No. 0 | Date 10-11-07 | Sheet No. 7 of 11

Ecology Software (MTCAStat) Results

95% UCL Calculation — Arsenic

DATA	ID
4.0	J15F83/J15F84
6.4	J15F77
3.7	J15F78
2.9	J15F79
2.2	J15F80
1.5	J15F81
3.2	J15F82
3.0	J15F85
3.7	J15F86
2.9	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	3.3
Censored		Lognormal mean	3.4
Detection limit or PQL		Std. devn.	1.3
Method detection limit		Median	3.1
TOTAL	10	Min.	1.5
		Max.	6.4
Lognormal distribution?		Normal distribution?	
r-squared is:	0.92	r-squared is:	0.86

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.4

95% UCL Calculation — Barium

DATA	ID
70.2	J15F83/J15F84
61.2	J15F77
78.5	J15F78
55.9	J15F79
55.0	J15F80
38.7	J15F81
67.7	J15F82
28.9	J15F85
87.5	J15F86
39.8	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	58.3
Censored		Lognormal mean	58.9
Detection limit or PQL		Std. devn.	18.6
Method detection limit		Median	58.6
TOTAL	10	Min.	28.9
		Max.	87.5
Lognormal distribution?		Normal distribution?	
r-squared is:	0.95	r-squared is:	0.98

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 74.6

95% UCL Calculation — Beryllium

DATA	ID
0.32	J15F83/J15F84
0.30	J15F77
0.02	J15F78
0.02	J15F79
0.02	J15F80
0.02	J15F81
0.02	J15F82
0.21	J15F85
0.35	J15F86
0.25	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	0.15
Censored		Lognormal mean	0.22
Detection limit or PQL		Std. devn.	0.15
Method detection limit		Median	0.11
TOTAL	10	Min.	0.02
		Max.	0.35
Lognormal distribution?		Normal distribution?	
r-squared is:	0.74	r-squared is:	0.81

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

UCL (based on Z-statistic) is 0.23

95% UCL Calculation — Boron

DATA	ID
3.5	J15F83/J15F84
2.5	J15F77
1.6	J15F78
1.3	J15F79
1.8	J15F80
0.55	J15F81
2.4	J15F82
0.50	J15F85
4.3	J15F86
0.49	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	1.9
Censored		Lognormal mean	2.0
Detection limit or PQL		Std. devn.	1.3
Method detection limit		Median	1.7
TOTAL	10	Min.	0.49
		Max.	4.3
Lognormal distribution?		Normal distribution?	
r-squared is:	0.92	r-squared is:	0.93

Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.2

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation

Date 10/11/07 Calc. No. 0100F-CA-V0315 Rev. No. 0

Job No. 14655 Checked J. M. Capron Date 10-11-07

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Ecology Software (MTCAStat) Results

95% UCL Calculation — Chromium

DATA	ID
9.7	J15F83/J15F84
10.7	J15F77
10.1	J15F78
7.8	J15F79
8.7	J15F80
7.9	J15F81
8.5	J15F82
8.3	J15F85
9.5	J15F86
9.0	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	9.0
Censored		Lognormal mean	9.0
Detection limit or PQL		Std. devn.	0.96
Method detection limit		Median	8.9
TOTAL	10	Min.	7.8
		Max.	10.7
Lognormal distribution?		Normal distribution?	
r-squared is:	0.98	r-squared is:	0.97
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		9.6	

95% UCL Calculation — Hexavalent Chromium

DATA	ID
0.10	J15F83/J15F84
0.27	J15F77
0.26	J15F78
0.10	J15F79
0.28	J15F80
0.27	J15F81
0.10	J15F82
0.24	J15F85
0.27	J15F86
0.26	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	0.22
Censored		Lognormal mean	0.22
Detection limit or PQL		Std. devn.	0.08
Method detection limit		Median	0.26
TOTAL	10	Min.	0.10
		Max.	0.28
Lognormal distribution?		Normal distribution?	
r-squared is:	0.68	r-squared is:	0.71
Recommendations:			
Reject BOTH lognormal and normal distributions. See Statistics Guidance.			
UCL (based on Z-statistic) is		0.26	

95% UCL Calculation — Cobalt

DATA	ID
6.3	J15F83/J15F84
6.6	J15F77
6.5	J15F78
5.1	J15F79
5.5	J15F80
4.7	J15F81
5.5	J15F82
4.7	J15F85
6.1	J15F86
5.2	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	5.6
Censored		Lognormal mean	5.6
Detection limit or PQL		Std. devn.	0.71
Method detection limit		Median	5.5
TOTAL	10	Min.	4.7
		Max.	6.6
Lognormal distribution?		Normal distribution?	
r-squared is:	0.94	r-squared is:	0.94
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		6.1	

95% UCL Calculation — Copper

DATA	ID
13.2	J15F83/J15F84
11.9	J15F77
11.6	J15F78
10.7	J15F79
12.8	J15F80
9.9	J15F81
10.4	J15F82
11.0	J15F85
12.2	J15F86
12.6	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	11.6
Censored		Lognormal mean	11.6
Detection limit or PQL		Std. devn.	1.1
Method detection limit		Median	11.8
TOTAL	10	Min.	9.9
		Max.	13.2
Lognormal distribution?		Normal distribution?	
r-squared is:	0.98	r-squared is:	0.98
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		12.3	

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel LH
Project 100-F Field Remediation
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation

Date 10/11/07
Job No. 14655
Calc. No. 0100F-CA-V0315
Checked J. M. Capron JMC

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Ecology Software (MTCAStat) Results

95% UCL Calculation — Lead

DATA	ID
9.8	J15F83/J15F84
8.2	J15F77
9.4	J15F78
7.9	J15F79
5.4	J15F80
2.3	J15F81
7.4	J15F82
3.7	J15F85
12.6	J15F86
4.0	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	7.1
Censored		Lognormal mean	7.3
Detection limit or PQL		Std. devn.	3.2
Method detection limit		Median	7.7
TOTAL	10	Min.	2.3
		Max.	12.6
Lognormal distribution?		Normal distribution?	
r-squared is:	0.94	r-squared is:	0.97
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		10.8	

95% UCL Calculation — Manganese

DATA	ID
283	J15F83/J15F84
287	J15F77
328	J15F78
247	J15F79
266	J15F80
211	J15F81
273	J15F82
202	J15F85
292	J15F86
249	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	264
Censored		Lognormal mean	264
Detection limit or PQL		Std. devn.	38
Method detection limit		Median	270
TOTAL	10	Min.	202
		Max.	328
Lognormal distribution?		Normal distribution?	
r-squared is:	0.95	r-squared is:	0.96
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		289	

95% UCL Calculation — Nickel

DATA	ID
11.5	J15F83/J15F84
11.5	J15F77
11.3	J15F78
8.9	J15F79
9.7	J15F80
8.9	J15F81
9.4	J15F82
8.8	J15F85
10.3	J15F86
10.1	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	10.0
Censored		Lognormal mean	10.0
Detection limit or PQL		Std. devn.	1.1
Method detection limit		Median	9.9
TOTAL	10	Min.	8.8
		Max.	11.5
Lognormal distribution?		Normal distribution?	
r-squared is:	0.91	r-squared is:	0.91
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		10.7	

95% UCL Calculation — Vanadium

DATA	ID
32.8	J15F83/J15F84
34.8	J15F77
34.7	J15F78
26.8	J15F79
31.6	J15F80
31.9	J15F81
29.3	J15F82
28.8	J15F85
33.4	J15F86
29.1	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	31.3
Censored		Lognormal mean	31.3
Detection limit or PQL		Std. devn.	2.7
Method detection limit		Median	31.8
TOTAL	10	Min.	26.8
		Max.	34.8
Lognormal distribution?		Normal distribution?	
r-squared is:	0.95	r-squared is:	0.96
Recommendations:			
Use lognormal distribution.			
UCL (Land's method) is		33.0	

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation

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Ecology Software (MTCAStat) Results

95% UCL Calculation — Zinc

DATA	ID
34.5	J15F83/J15F84
38.2	J15F77
38.8	J15F78
30.7	J15F79
32.6	J15F80
26.9	J15F81
33.7	J15F82
27.9	J15F85
37.2	J15F86
37.2	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	33.8
Censored		Lognormal mean	33.8
Detection limit or PQL		Std. devn.	4.2
Method detection limit		Median	34.1
TOTAL	10	Min.	26.9
		Max.	38.8
Lognormal distribution?		Normal distribution?	
r-squared is:	0.93	r-squared is:	0.94

Recommendations:

Use lognormal distribution.

UCL (Land's method) is 36.6

95% UCL Calculation — Bis(2-ethylhexyl) phthalate

DATA	ID
168	J15F83/J15F84
540	J15F77
99	J15F78
100	J15F79
250	J15F80
61	J15F81
79	J15F82
165	J15F85
165	J15F86
165	J15F87

Number of samples		Uncensored values	
Uncensored	10	Mean	114
Censored		Lognormal mean	121
Detection limit or PQL		Std. devn.	60
Method detection limit		Median	142.5
TOTAL	10	Min.	37
		Max.	170
Lognormal distribution?		Normal distribution?	
r-squared is:	0.78	r-squared is:	0.80

Recommendations:

Reject BOTH lognormal and normal distributions. See Statistics Guidance.

UCL (Land's method) is 145

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel — Date 10/11/07 — Calc. No. 0100F-CA-V0315 — Rev. No. 0
Project 100-F Field Remediation — Job No. 14655 — Checked J. M. Capron — Date 10-11-07
Subject 100-F-26:10 Cleanup Verification 95% UCL Calculation — Sheet No. 11 of 11

Split/Duplicate Analysis, Excavation Shallow Zone

Sample Area	Sample Number	Sample Date	Potassium-40 pCi/g	Q	MDA	Radium-226 pCi/g	Q	MDA	Radium-228 pCi/g	Q	MDA	Thorium-228 pCi/g	Q	MDA	Thorium-232 pCi/g	Q	MDA	Aluminum mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL
SZ-7	J15F83	8/16/07	11.7		0.550	0.488		0.103	0.622		0.271	0.612		0.104	0.622		0.271	6310		4.6	4.0		1.1	68.0	C	0.06
SZ-7 Dup	J15F84	8/16/07	12.8		0.569	0.522		0.123	0.730		0.188	0.618		0.071	0.730		0.188	5970		4.8	3.9		1.2	72.3	C	0.06

Analysis:

TDL		0.5	0.1	0.2	1	1	5	10	2
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	**Yes (calc RPD)**	No - evaluate difference	**Yes (calc RPD)**
	RPD	9%					6%		6%
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable

Split/Duplicate Analysis, Excavation Shallow Zone (continued)

Sample Area	Sample Number	Sample Date	Beryllium mg/kg	Q	PQL	Boron mg/kg	Q	PQL	Calcium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Iron mg/kg	Q	PQL	Lead mg/kg	Q	PQL
SZ-7	J15F83	8/16/07	0.31		0.03	3.4		1.0	5160	C	2.0	10.1	C	0.28	6.3		0.22	13.2	C	0.25	15700	C	6.6	9.4		0.92
SZ-7 Dup	J15F84	8/16/07	0.32		0.03	3.6		1.1	5050	C	2.1	9.2	C	0.29	6.2		0.23	13.2	C	0.26	14900	C	7.0	10.1		0.96

Analysis:

TDL		0.5	2	100	1	2	1	5	5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No - evaluate difference	No - evaluate difference	**Yes (calc RPD)**	**Yes (calc RPD)**	No - evaluate difference	**Yes (calc RPD)**	**Yes (calc RPD)**	No - evaluate difference
	RPD			2%	9%		0%	5%	
	Difference >2xTDL?	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable

Split/Duplicate Analysis, Excavation Shallow Zone (continued)

Sample Area	Sample Number	Sample Date	Magnesium mg/kg	Q	PQL	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Potassium mg/kg	Q	PQL	Selenium mg/kg	Q	PQL	Silicon mg/kg	Q	PQL	Sodium mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL
SZ-7	J15F83	8/16/07	4170	C	2.3	281	C	0.19	11.2		0.75	1020	C	8.9	1.3		1.2	1600	C	2.4	190	C	1.9	33.9		0.22
SZ-7 Dup	J15F84	8/16/07	4070	C	2.4	285	C	0.20	11.8		0.79	1030	C	9.3	1.3	U	1.3	1580	C	2.5	191	C	2	31.6		0.23

Analysis:

TDL		75	5	4	400	10	2	50	2.5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No - evaluate difference	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	**Yes (calc RPD)**	No - evaluate difference	No - evaluate difference		**Yes (calc RPD)**	No - evaluate difference	**Yes (calc RPD)**
	RPD	2%	1%				1%		7%
	Difference >2xTDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	No - acceptable	Not applicable

Split/Duplicate Analysis, Excavation Shallow Zone (continued)

Sample Area	Sample Number	Sample Date	Zinc ug/kg	Q	PQL	Bis(2-ethylhexyl) phthalate ug/kg	Q	PQL	Di-n-butylphthalate ug/kg	Q	PQL
SZ-7	J15F83	8/16/07	35.1	C	0.11	33	JB	330	21	JB	330
SZ-7 Dup	J15F84	8/16/07	33.8	C	0.12	42	JB	330	26	JB	330

Analysis:

TDL		1	330	330
Duplicate Analysis	Both > PQL?	**Yes (continue)**	No - evaluate difference	No - evaluate difference
	Both >5xTDL?	**Yes (calc RPD)**		
	RPD	4%		
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Americium-241			Barium-133			Cesium-137			Cobalt-60			Europium-152		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.086	U	0.086				0.095	U	0.095	0.120	U	0.120	0.160	U	0.160
RC-BCL-2	J14CB8	1/22/07	0.320	U	0.320				0.068	U	0.068	0.070	U	0.070	0.160	U	0.160
RC-1	J14CB9	1/22/07	0.067	U	0.067				0.046	U	0.046	0.049	U	0.049	0.130	U	0.130
RC-2	J14CC0	1/22/07	0.090	U	0.090				0.100	U	0.100	0.140	U	0.140	0.160	U	0.160
RC-3	J14CC1	1/23/07	0.068	U	0.068				0.072	U	0.072	0.100	U	0.100	0.130	U	0.130
RC-4	J14CC2	1/23/07	0.070	U	0.070				0.049	U	0.049	0.058	U	0.058	0.140	U	0.140
BCL-A	J15F73	8/14/07	0.076	U	0.076	0.054	U	0.054	0.055	U	0.055	0.052	U	0.052	0.156	U	0.156
BCL-B	J15F74	8/14/07	0.102	U	0.102	0.071	U	0.071	0.077	U	0.077	0.080	U	0.080	0.188	U	0.188
BCL-C	J15F75	8/14/07	0.335	U	0.335	0.107	U	0.107	0.092	U	0.092	0.082	U	0.082	0.235	U	0.235
BCL-D	J15F76	8/14/07	0.087	U	0.087	0.060	U	0.060	0.056	U	0.056	0.060	U	0.060	0.172	U	0.172
SZ-1	J15F77	8/14/07	0.245	U	0.245	0.077	U	0.077	0.069	U	0.069	0.059	U	0.059	0.171	U	0.171
SZ-2	J15F78	8/14/07	0.072	U	0.072	0.075	U	0.075	0.067	U	0.067	0.070	U	0.070	0.170	U	0.170
SZ-3	J15F79	8/14/07	0.026	U	0.026	0.028	U	0.028	0.023	U	0.023	0.024	U	0.024	0.058	U	0.058
SZ-4	J15F80	8/14/07	0.318	U	0.318	0.068	U	0.068	0.068	U	0.068	0.066	U	0.066	0.168	U	0.168
SZ-5	J15F81	8/14/07	0.085	U	0.085	0.098	U	0.098	0.085	U	0.085	0.084	U	0.084	0.244	U	0.244
SZ-6	J15F82	8/14/07	0.077	U	0.077	0.053	U	0.053	0.045	U	0.045	0.059	U	0.059	0.144	U	0.144
SZ-7	J15F83	8/16/07	0.266	U	0.266	0.060	U	0.060	0.058	U	0.058	0.058	U	0.058	0.126	U	0.126
SZ-7 Dup	J15F84	8/16/07	0.064	U	0.064	0.071	U	0.071	0.055	U	0.055	0.053	U	0.053	0.148	U	0.148
SZ-8	J15F85	8/16/07	0.079	U	0.079	0.090	U	0.090	0.086	U	0.086	0.082	U	0.082	0.218	U	0.218
SZ-9	J15F86	8/16/07	0.314	U	0.314	0.079	U	0.079	0.141	U	0.141	0.065	U	0.065	0.200	U	0.200
SZ-10	J15F87	8/16/07	0.293	U	0.293	0.075	U	0.075	0.061	U	0.061	0.075	U	0.075	0.155	U	0.155

Sample Location	HEIS Number	Sample Date	Europium-154			Europium-155			Nickel-63			Potassium-40			Radium-226		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.440	U	0.440	0.100	U	0.100	-0.536	U	3.700	12.4		1.60	0.390		0.190
RC-BCL-2	J14CB8	1/22/07	0.280	U	0.280	0.170	U	0.170	-0.166	U	3.700	10.6		0.790	0.450		0.140
RC-1	J14CB9	1/22/07	0.160	U	0.160	0.120	U	0.120	-0.671	U	3.700	12.3		0.490	0.429		0.110
RC-2	J14CC0	1/22/07	0.450	U	0.450	0.100	U	0.100	0.082	U	3.600	14.1		1.60	0.292		0.200
RC-3	J14CC1	1/23/07	0.300	U	0.300	0.080	U	0.080	0.085	U	3.700	11.2		1.00	0.525		0.140
RC-4	J14CC2	1/23/07	0.210	U	0.210	0.110	U	0.110	1.29	U	3.700	10.4		0.480	0.382		0.120
BCL-A	J15F73	8/14/07	0.178	U	0.178	0.134	U	0.134				13.2		0.745	0.457		0.120
BCL-B	J15F74	8/14/07	0.260	U	0.260	0.159	U	0.159				14.2		0.421	0.454		0.155
BCL-C	J15F75	8/14/07	0.270	U	0.270	0.237	U	0.237				10.7		0.794	0.466		0.167
BCL-D	J15F76	8/14/07	0.188	U	0.188	0.144	U	0.144				13.6		0.589	0.459		0.101
SZ-1	J15F77	8/14/07	0.196	U	0.196	0.169	U	0.169				10.9		0.534	0.327		0.116
SZ-2	J15F78	8/14/07	0.228	U	0.228	0.141	U	0.141				13.3		0.660	0.586		0.120
SZ-3	J15F79	8/14/07	0.077	U	0.077	0.053	U	0.053				12.6		0.259	0.510		0.048
SZ-4	J15F80	8/14/07	0.225	U	0.225	0.153	U	0.153				10.3		0.659	0.329		0.134
SZ-5	J15F81	8/14/07	0.258	U	0.258	0.196	U	0.196				8.97		0.693	0.293		0.146
SZ-6	J15F82	8/14/07	0.197	U	0.197	0.130	U	0.130				12.2		0.626	0.440		0.099
SZ-7	J15F83	8/16/07	0.187	U	0.187	0.126	U	0.126				11.7		0.550	0.488		0.103
SZ-7 Dup	J15F84	8/16/07	0.196	U	0.196	0.124	U	0.124				12.8		0.569	0.522		0.123
SZ-8	J15F85	8/16/07	0.253	U	0.253	0.173	U	0.173				8.31		0.677	0.224	U	0.224
SZ-9	J15F86	8/16/07	0.230	U	0.230	0.197	U	0.197				10.9		0.760	0.456		0.150
SZ-10	J15F87	8/16/07	0.227	U	0.227	0.158	U	0.158				12.6		0.432	0.348		0.121

Sample Location	HEIS Number	Sample Date	Radium-228			Silver-108 metastable			Thorium-228			Thorium-232			Strontium (total)		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.750	U	0.750	0.053	U	0.053	0.331		0.078	0.750	U	0.750	0.058	U	0.320
RC-BCL-2	J14CB8	1/22/07	0.767		0.340	0.047	U	0.047	0.503		0.073	0.767		0.340	0.003	U	0.310
RC-1	J14CB9	1/22/07	0.633		0.210	0.037	U	0.037	0.470		0.057	0.633		0.210	0.019	U	0.330
RC-2	J14CC0	1/22/07	1.20		0.560	0.054	U	0.054	0.253		0.084	1.20		0.560	-0.096	U	0.280
RC-3	J14CC1	1/23/07	0.660	U	0.660	0.044	U	0.044	0.339		0.065	0.660	U	0.660	0.073	U	0.240
RC-4	J14CC2	1/23/07	0.549		0.190	0.036	U	0.036	0.522		0.098	0.549		0.190	-0.028	U	0.260
BCL-A	J15F73	8/14/07	0.677		0.226	0.043	U	0.043	0.661		0.070	0.677		0.226			
BCL-B	J15F74	8/14/07	0.769		0.330	0.051	U	0.051	0.669		0.092	0.769		0.330			
BCL-C	J15F75	8/14/07	0.679		0.373	0.058	U	0.058	0.662		0.172	0.679		0.373			
BCL-D	J15F76	8/14/07	0.677		0.324	0.049	U	0.049	0.575		0.083	0.677		0.324			
SZ-1	J15F77	8/14/07	0.537		0.278	0.048	U	0.048	0.553		0.079	0.537		0.278			
SZ-2	J15F78	8/14/07	1.02		0.257	0.048	U	0.048	0.658		0.085	1.02		0.257			
SZ-3	J15F79	8/14/07	0.679		0.102	0.017	U	0.017	0.598		0.027	0.679		0.102			
SZ-4	J15F80	8/14/07	0.692		0.362	0.051	U	0.051	0.569		0.126	0.692		0.362			
SZ-5	J15F81	8/14/07	0.463		0.327	0.063	U	0.063	0.355		0.118	0.463		0.327			
SZ-6	J15F82	8/14/07	0.564		0.226	0.039	U	0.039	0.547		0.067	0.564		0.226			
SZ-7	J15F83	8/16/07	0.622		0.271	0.041	U	0.041	0.612		0.104	0.622		0.271			
SZ-7 Dup	J15F84	8/16/07	0.730		0.188	0.044	U	0.044	0.618		0.071	0.730		0.188			
SZ-8	J15F85	8/16/07	0.513		0.317	0.060	U	0.060	0.635		0.150	0.513		0.317			
SZ-9	J15F86	8/16/07	0.944		0.256	0.056	U	0.056	0.586		0.138	0.944		0.256			
SZ-10	J15F87	8/16/07	0.503		0.292	0.050	U	0.050	0.525		0.076	0.503		0.292			

Attachment	1	Sheet No.	1 of 11
Originator	L. D. Habel LH	Date	10/11/07
Checked	J. M. Capron JMC	Date	10/11/07
Calc. No.	~~0100F-CA-V0304~~ 0100F-CA-V0315 LH	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA
RC-BCL-1	J14CB7	1/22/07	0.150	U	0.150	14.0	U	14.0
RC-BCL-2	J14CB8	1/22/07	0.250	U	0.250	8.90	U	8.90
RC-1	J14CB9	1/22/07	0.210	U	0.210	5.90	U	5.90
RC-2	J14CC0	1/22/07	0.160	U	0.160	14.0	U	14.0
RC-3	J14CC1	1/23/07	0.120	U	0.120	11.0	U	11.0
RC-4	J14CC2	1/23/07	0.190	U	0.190	6.30	U	6.30
BCL-A	J15F73	8/14/07	0.223	U	0.223	6.13	U	6.13
BCL-B	J15F74	8/14/07	0.275	U	0.275	8.09	U	8.09
BCL-C	J15F75	8/14/07	0.346	U	0.346	10.5	U	10.5
BCL-D	J15F76	8/14/07	0.246	U	0.246	7.31	U	7.31
SZ-1	J15F77	8/14/07	0.258	U	0.258	7.34	U	7.34
SZ-2	J15F78	8/14/07	0.250	U	0.250	7.25	U	7.25
SZ-3	J15F79	8/14/07	0.091	U	0.091	2.68	U	2.68
SZ-4	J15F80	8/14/07	0.250	U	0.250	7.93	U	7.93
SZ-5	J15F81	8/14/07	0.336	U	0.336	9.93	U	9.93
SZ-6	J15F82	8/14/07	0.208	U	0.208	6.35	U	6.35
SZ-7	J15F83	8/16/07	0.218	U	0.218	7.11	U	7.11
SZ-7 Dup	J15F84	8/16/07	0.230	U	0.230	6.56	U	6.56
SZ-8	J15F85	8/16/07	0.302	U	0.302	10.1	U	10.1
SZ-9	J15F86	8/16/07	0.305	U	0.305	7.96	U	7.96
SZ-10	J15F87	8/16/07	0.244	U	0.244	8.40	U	8.40

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

B = blank contamination (organics)
BCL = below cleanup level
C = blank contamination (inorganics)
D = diluted
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
J = estimated
MDA = minimum detectable activity
PQL = practical quantitation limit
Q = qualifier
RC = road crossing
SZ = shallow zone
U = undetected

Attachment	1	Sheet No.	2 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	~~0100F-CA-V0294~~ 0100F-CA-V0315	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	4800		6.2	0.73	UJ	0.79	8.5		0.9	54.1	C	0.03	0.29		0.03
RC-BCL-2	J14CB8	1/22/07	4630		6.2	0.73	UJ	0.73	7.1		0.9	48.0	C	0.03	0.23		0.03
RC-1	J14CB9	1/22/07	3890		6.1	0.72	UJ	0.72	2.4		0.9	53.0	C	0.03	0.16		0.03
RC-2	J14CC0	1/22/07	4360		6.1	0.72	UJ	0.72	2.6		0.9	34.4	C	0.03	0.16		0.03
RC-3	J14CC1	1/23/07	3650		6.1	0.73	U	0.73	2.4		0.9	31.6	C	0.03	0.14		0.03
RC-4	J14CC2	1/23/07	3510		6.1	0.72	U	0.72	1.6		0.9	27.8	C	0.03	0.19		0.03
BCL-A	J15F73	8/14/07	5910	C	4.8	0.73	C	0.63	2.3		1.2	68.7	C	0.06	0.27		0.03
BCL-B	J15F74	8/14/07	6690	C	4.9	0.65	U	0.65	3.7		1.2	66.0	C	0.06	0.27		0.03
BCL-C	J15F75	8/14/07	7510	C	4.7	0.88	C	0.63	4.7		1.2	117	C	0.06	0.28		0.03
BCL-D	J15F76	8/14/07	5950	C	4.8	0.72	C	0.63	2.6		1.2	50.6	C	0.06	0.23		0.03
SZ-1	J15F77	8/14/07	7020	C	4.9	1.00	C	0.65	6.4		1.2	61.2	C	0.06	0.30		0.03
SZ-2	J15F78	8/14/07	7290		4.9	0.64	U	0.64	3.7		1.2	78.5	C	0.06	0.03	U	0.03
SZ-3	J15F79	8/14/07	5530		4.8	0.64	U	0.64	2.9		1.2	55.9	C	0.06	0.03	U	0.03
SZ-4	J15F80	8/14/07	5910		4.9	0.79		0.65	2.2		1.2	55.0	C	0.06	0.03	U	0.03
SZ-5	J15F81	8/14/07	4770		4.9	0.66	U	0.66	1.5		1.2	38.7	C	0.06	0.03	U	0.03
SZ-6	J15F82	8/14/07	5830		5.0	0.66	U	0.66	3.2		1.2	67.7	C	0.06	0.03	U	0.03
SZ-7	J15F83	8/16/07	6310		4.6	0.61	U	0.61	4.0		1.1	68.0	C	0.06	0.31		0.03
SZ-7 Dup	J15F84	8/16/07	5970		4.8	0.64	U	0.64	3.9		1.2	72.3	C	0.06	0.32		0.03
SZ-8	J15F85	8/16/07	4110		4.7	0.62	U	0.62	3.0		1.2	28.9	C	0.06	0.21		0.03
SZ-9	J15F86	8/16/07	6140		4.8	0.64	U	0.64	3.7		1.2	87.5	C	0.06	0.35		0.03
SZ-10	J15F87	8/16/07	4820		4.5	0.60	U	0.60	2.9		1.1	39.8	C	0.05	0.25		0.03

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium (total)			Hexavalent Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.6	CUJ	0.6	0.09	UC	0.09	3980	C	3.6	7.5	C	0.35	0.21	U	0.21
RC-BCL-2	J14CB8	1/22/07	1.1	CUJ	0.6	0.11	CUJ	0.09	3970	C	3.7	7.2	C	0.35	0.21	U	0.21
RC-1	J14CB9	1/22/07	0.6	UC	0.6	0.12	CUJ	0.09	4340	C	3.6	7.4	C	0.35	0.25		0.21
RC-2	J14CC0	1/22/07	0.6	UC	0.6	0.15	CUJ	0.09	4000	C	3.6	7.8	C	0.35	0.32		0.21
RC-3	J14CC1	1/23/07	0.6	UC	0.6	0.10	C	0.09	2640	C	3.6	7.1	C	0.35	0.21	U	0.21
RC-4	J14CC2	1/23/07	0.6	UC	0.6	0.09	UC	0.09	3330	C	3.6	7.0	C	0.35	0.30		0.21
BCL-A	J15F73	8/14/07	4.0		1.0	0.14	U	0.14	4930	C	2.0	8.3	C	0.29	0.27		0.20
BCL-B	J15F74	8/14/07	1.1	U	1.1	0.15	U	0.15	3990	C	2.1	9.9	C	0.29	0.20	U	0.20
BCL-C	J15F75	8/14/07	5.8		1.0	0.14	U	0.14	8460	C	2.0	10.7	C	0.29	0.20	U	0.20
BCL-D	J15F76	8/14/07	2.4		1.0	0.14	U	0.14	3740	C	2.0	8.8	C	0.29	0.20	U	0.20
SZ-1	J15F77	8/14/07	2.5		1.1	0.15	U	0.15	4300	C	2.1	10.7	C	0.30	0.27		0.20
SZ-2	J15F78	8/14/07	1.6		1.1	0.15	U	0.15	4130	C	2.1	10.1	C	0.29	0.26		0.20
SZ-3	J15F79	8/14/07	1.3		1.0	0.14	U	0.14	3650	C	2.1	7.8	C	0.29	0.20	U	0.20
SZ-4	J15F80	8/14/07	1.8		1.1	0.15	U	0.15	3660	C	2.1	8.7	C	0.30	0.28		0.20
SZ-5	J15F81	8/14/07	1.1	U	1.1	0.15	U	0.15	3300	C	2.1	7.9	C	0.30	0.27		0.20
SZ-6	J15F82	8/14/07	2.4		1.1	0.15	U	0.15	3880	C	2.1	8.5	C	0.30	0.20	U	0.20
SZ-7	J15F83	8/16/07	3.4		1.0	0.14	U	0.14	5160	C	2.0	10.1	C	0.28	0.20	U	0.20
SZ-7 Dup	J15F84	8/16/07	3.6		1.1	0.15	U	0.15	5050	C	2.1	9.2	C	0.29	0.20	U	0.20
SZ-8	J15F85	8/16/07	1.0	U	1.0	0.14	U	0.14	3000	C	2.0	8.3	C	0.28	0.24		0.20
SZ-9	J15F86	8/16/07	4.3		1.0	0.15	U	0.15	4590	C	2.1	9.5	C	0.29	0.27		0.20
SZ-10	J15F87	8/16/07	0.98	U	0.98	0.14	U	0.14	6200	C	1.9	9.0	C	0.27	0.26		0.20

Sample Location	HEIS Number	Sample Date	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
RC-BCL-1	J14CB7	1/22/07	5.2		0.15	11.8		0.20	12300		7.1	24.9		0.47	3180	C	1.3
RC-BCL-2	J14CB8	1/22/07	4.7		0.15	10.9		0.21	11100		7.2	19.7		0.47	3070	C	1.3
RC-1	J14CB9	1/22/07	3.8		0.14	10.8		0.20	9770		7.1	5.2		0.46	2930	C	1.2
RC-2	J14CC0	1/22/07	4.3		0.14	10.0		0.20	10900		7.0	6.3		0.46	3160	C	1.3
RC-3	J14CC1	1/23/07	4.2		0.15	12.0		0.20	12100		7.1	2.7		0.46	2840	C	1.3
RC-4	J14CC2	1/23/07	4.1		0.14	10.8		0.20	11000		7.0	2.7		0.46	2750	C	1.3
BCL-A	J15F73	8/14/07	6.1		0.23	12.0		0.26	14700	C	6.9	7.8		0.95	3690	C	2.3
BCL-B	J15F74	8/14/07	6.4		0.24	11.6		0.26	16300	C	7.0	10.7		0.97	3790	C	2.4
BCL-C	J15F75	8/14/07	6.8		0.23	15.8		0.26	16500	C	6.8	8.8		0.94	4560	C	2.3
BCL-D	J15F76	8/14/07	5.7		0.23	11.0		0.26	14600	C	6.9	4.8		0.95	3610	C	2.3
SZ-1	J15F77	8/14/07	6.6		0.24	11.9		0.27	16400	C	7.1	8.2		0.98	4060	C	2.4
SZ-2	J15F78	8/14/07	6.5		0.23	11.6		0.26	16800		7.0	9.4		0.97	3960	C	2.4
SZ-3	J15F79	8/14/07	5.1		0.23	10.7		0.26	12200		6.9	7.9		0.96	3240	C	2.3
SZ-4	J15F80	8/14/07	5.5		0.24	12.8		0.27	13600		7.1	5.4		0.97	3500	C	2.4
SZ-5	J15F81	8/14/07	4.7		0.24	9.9		0.27	12200		7.1	2.3		0.98	3260	C	2.4
SZ-6	J15F82	8/14/07	5.5		0.24	10.4		0.27	13200		7.2	7.4		0.99	3280	C	2.4
SZ-7	J15F83	8/16/07	6.3		0.22	13.2	C	0.25	15700	C	6.6	9.4		0.92	4170	C	2.3
SZ-7 Dup	J15F84	8/16/07	6.2		0.23	13.2	C	0.26	14900	C	7.0	10.1		0.96	4070	C	2.4
SZ-8	J15F85	8/16/07	4.7		0.22	11.0	C	0.25	11600	C	6.7	3.7		0.93	3140	C	2.3
SZ-9	J15F86	8/16/07	6.1		0.23	12.2	C	0.26	15600	C	7.0	12.6		0.96	3810	C	2.4
SZ-10	J15F87	8/16/07	5.2		0.22	12.6	C	0.25	12800	C	65.0	4.0		0.90	3520	C	2.2

Attachment	1	Sheet No.	3 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	~~0100F-CA-V0294~~ 0100F-CA-V03154	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	257		0.12	0.02	U	0.02	0.47	U	0.47	8.8		0.64	964	C	6.2
RC-BCL-2	J14CB8	1/22/07	234		0.12	0.02	U	0.02	0.47	U	0.48	9.0		0.65	864	C	6.2
RC-1	J14CB9	1/22/07	215		0.12	0.02	U	0.02	0.47		0.46	9.5		0.64	587	C	6.1
RC-2	J14CC0	1/22/07	221		0.12	0.01	U	0.01	0.46	U	0.46	10.5		0.63	649	C	6.1
RC-3	J14CC1	1/23/07	197		0.12	0.02	U	0.02	0.46	U	0.46	8.5		0.64	393	C	6.2
RC-4	J14CC2	1/23/07	205		0.12	0.01	U	0.01	0.46	U	0.46	9.0		0.63	428	C	6.1
BCL-A	J15F73	8/14/07	263		0.20	0.02	U	0.02	0.46	U	0.46	10.5		0.78	1140	C	9.2
BCL-B	J15F74	8/14/07	291		0.21	0.02	U	0.02	0.47	U	0.47	10.3		0.79	1410	C	9.4
BCL-C	J15F75	8/14/07	291		0.20	0.02	U	0.02	0.46	U	0.46	12.3		0.77	1300	C	9.1
BCL-D	J15F76	8/14/07	244		0.20	0.01	U	0.01	0.46	U	0.46	9.6		0.78	1040	C	9.2
SZ-1	J15F77	8/14/07	287		0.21	0.02	U	0.02	0.48	U	0.48	11.5		0.80	1310	C	9.5
SZ-2	J15F78	8/14/07	328		0.21	0.01	U	0.01	0.64	C	0.47	11.3		0.79	1560		9.4
SZ-3	J15F79	8/14/07	247		0.20	0.01	U	0.01	0.46	U	0.46	8.9		0.78	1020		9.3
SZ-4	J15F80	8/14/07	266		0.21	0.01	U	0.01	0.48	C	0.47	9.7		0.90	1040		9.4
SZ-5	J15F81	8/14/07	211		0.21	0.01	U	0.01	0.48	U	0.48	8.9		0.80	708		9.5
SZ-6	J15F82	8/14/07	273		0.21	0.01	U	0.01	0.48	U	0.48	9.4		0.81	1150		9.6
SZ-7	J15F83	8/16/07	281	C	0.19	0.01	U	0.01	0.44	U	0.44	11.2		0.75	1020	C	8.9
SZ-7 Dup	J15F84	8/16/07	285	C	0.20	0.01	U	0.01	0.47	U	0.47	11.8		0.79	1030	C	9.3
SZ-8	J15F85	8/16/07	202	C	0.20	0.02	U	0.02	0.45	U	0.45	8.8		0.76	482	C	9.0
SZ-9	J15F86	8/16/07	292	C	0.20	0.02	U	0.02	0.47	U	0.47	10.3		0.79	1260	C	9.3
SZ-10	J15F87	8/16/07	249	C	0.19	0.01		0.01	0.44	U	0.44	10.1		0.74	788	C	8.7

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
RC-BCL-1	J14CB7	1/22/07	1.3	U	1.3	466	CJ	1.9	0.15	U	0.15	116	C	0.9	26.4		0.17
RC-BCL-2	J14CB8	1/22/07	1.3	U	1.3	743	CJ	1.9	0.15	U	0.15	120	C	0.7	21.5		0.18
RC-1	J14CB9	1/22/07	1.2	U	1.2	439	CJ	1.9	0.14	U	0.14	119	C	0.7	21.0		0.17
RC-2	J14CC0	1/22/07	1.2	U	1.2	484	CJ	1.8	0.14	U	0.14	117	C	0.7	24.6		0.17
RC-3	J14CC1	1/23/07	1.2	U	1.2	471	C	1.9	0.15	U	0.15	118	C	0.7	31.7		0.17
RC-4	J14CC2	1/23/07	1.2	U	1.2	413	C	1.8	0.14	U	0.14	102	C	0.7	26.8		0.17
BCL-A	J15F73	8/14/07	1.8		1.2	1650	C	2.5	0.26	U	0.26	171	C	2.0	32.2		0.23
BCL-B	J15F74	8/14/07	1.3	U	1.3	932	C	2.5	0.26	U	0.26	168	C	2.1	34.9		0.24
BCL-C	J15F75	8/14/07	1.2	U	1.2	1460	C	2.5	0.26	U	0.26	228	C	2.0	36.5		0.23
BCL-D	J15F76	8/14/07	1.2	U	1.2	1170	C	2.5	0.26	U	0.26	164	C	2.0	33.6		0.23
SZ-1	J15F77	8/14/07	1.5		1.3	1120	C	2.6	0.27	U	0.27	200	C	2.1	34.8		0.24
SZ-2	J15F78	8/14/07	1.3	U	1.3	1810		2.5	0.26	U	0.26	226	C	2.1	34.7		0.23
SZ-3	J15F79	8/14/07	1.2	U	1.2	2510		2.5	0.26	U	0.26	173	C	2.0	26.8		0.23
SZ-4	J15F80	8/14/07	1.3	U	1.3	2380		2.5	0.27	U	0.27	176	C	2.1	31.6		0.24
SZ-5	J15F81	8/14/07	1.3	U	1.3	1420		2.6	0.27	U	0.27	159	C	2.1	31.9		0.24
SZ-6	J15F82	8/14/07	1.3	U	1.3	2660		2.6	0.27	U	0.27	156	C	2.1	29.3		0.24
SZ-7	J15F83	8/16/07	1.3		1.2	1600	C	2.4	0.25	U	0.25	190	C	1.9	33.9		0.22
SZ-7 Dup	J15F84	8/16/07	1.3	U	1.3	1580	C	2.5	0.26	U	0.26	191	C	2.0	31.6		0.23
SZ-8	J15F85	8/16/07	1.2	U	1.2	871	C	2.4	0.25	U	0.25	80	C	2.0	28.8		0.22
SZ-9	J15F86	8/16/07	1.3	U	1.3	1510	C	2.5	0.26	U	0.26	142	C	2.0	33.4		0.22
SZ-10	J15F87	8/16/07	1.2	U	1.2	1040	C	2.4	0.25	U	0.25	94	C	1.9	29.1		0.22

Sample Location	HEIS Number	Sample Date	Zinc		
			mg/kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	30.5	C	0.12
RC-BCL-2	J14CB8	1/22/07	28.7	C	0.12
RC-1	J14CB9	1/22/07	40.5	C	0.12
RC-2	J14CC0	1/22/07	26.0	C	0.12
RC-3	J14CC1	1/23/07	26.0	C	0.12
RC-4	J14CC2	1/23/07	26.7	C	0.12
BCL-A	J15F73	8/14/07	44.2	C	0.12
BCL-B	J15F74	8/14/07	44.3	C	0.12
BCL-C	J15F75	8/14/07	51.9	C	0.11
BCL-D	J15F76	8/14/07	33.8	C	0.12
SZ-1	J15F77	8/14/07	38.2	C	0.12
SZ-2	J15F78	8/14/07	38.8	C	0.12
SZ-3	J15F79	8/14/07	30.7	C	0.12
SZ-4	J15F80	8/14/07	32.6	C	0.12
SZ-5	J15F81	8/14/07	26.9	C	0.12
SZ-6	J15F82	8/14/07	33.7	C	0.12
SZ-7	J15F83	8/16/07	35.1	C	0.11
SZ-7 Dup	J15F84	8/16/07	33.8	C	0.12
SZ-8	J15F85	8/16/07	27.9	C	0.11
SZ-9	J15F86	8/16/07	37.2	C	0.12
SZ-10	J15F87	8/16/07	37.2	C	0.11

Attachment	1	Sheet No.	4 of 11
Originator	L. D. Habel LDH	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	~~0100F-CA-V0294~~ 0100F-CA-V03154	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Aroclor-1016			Aroclor-1221			Aroclor-1232			Aroclor-1242			Aroclor-1248		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-BCL-2	J14CB8	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-1	J14CB9	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-2	J14CC0	1/22/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-3	J14CC1	1/23/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-4	J14CC2	1/23/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
BCL-A	J15F73	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
BCL-B	J15F74	8/14/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
BCL-C	J15F75	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
BCL-D	J15F76	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-1	J15F77	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-2	J15F78	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-3	J15F79	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-4	J15F80	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-5	J15F81	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-6	J15F82	8/14/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-7	J15F83	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-7 Dup	J15F84	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-8	J15F85	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-9	J15F86	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
SZ-10	J15F87	8/16/07	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13

Sample Location	HEIS Number	Sample Date	Aroclor-1254			Aroclor-1260			Aldrin			Alpha-BHC			alpha-Chlordane		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-2	J14CC0	1/22/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	14	U	14	14	U	14	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	14	U	14	14	U	14	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	8	J	13	5	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	14	U	14	14	U	14	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	13	U	13	4	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	13	U	13	10	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	13	U	13	4	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	13	U	13	6	J	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	13	U	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	4.0	J	13	13	U	13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	57		13	54		13	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Sample Location	HEIS Number	Sample Date	beta-1,2,3,4,5,6-Hexachlorocyclohexane			Delta-BHC			Dichlorodiphenyldichloroethane			Dichlorodiphenyldichloroethylene			Dichlorodiphenyltrichloroethane		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.5	D	1.4
RC-2	J14CC0	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Attachment	1	Sheet No.	5 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	0100F-CA-V0315	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Dieldrin			Endosulfan I			Endosulfan II			Endosulfan sulfate			Endrin		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-2	J14CC0	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	4.9	JD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Sample Location	HEIS Number	Sample Date	Endrin aldehyde			Endrin ketone			Gamma-BHC (Lindane)			gamma-Chlordane			Heptachlor		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-1	J14CB9	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-2	J14CC0	1/22/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7	1.7	U	1.7
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3
SZ-10	J15F87	8/16/07	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3	1.3	UD	1.3

Sample Location	HEIS Number	Sample Date	Heptachlor epoxide			Methoxychlor			Toxaphene			1,2,4-Trichlorobenzene			1,2-Dichlorobenzene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	1.4	UD	1.4	1.4	UD	1.4	14	UJ	14	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	1.4	UD	1.4	3.0	D	1.4	14	UJ	14	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	1.4	UD	1.4	2.5	D	1.4	14	UJ	14	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	1.4	UD	1.4	2.9	D	1.4	14	UJ	14	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	1.7	U	1.7	1.7	U	1.7	17	U	17	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	1.7	U	1.7	1.7	U	1.7	17	U	17	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	1.4	UD	1.4	1.4	UD	1.4	14	UD	14	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	1.3	UD	1.3	1.3	UD	1.3	13	UD	13	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	1.3	UD	1.3	1.7	JD X	1.7	13	UD	13	330	U	330	330	U	330

Attachment 1 Sheet No. 6 of 11
Originator L. D. Habel Date 10/11/07
Checked J. M. Capron Date
Calc. No. 0100F-CA-V0315 Rev. No. 0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	1,3-Dichlorobenzene			1,4-Dichlorobenzene			2,4,5-Trichlorophenol			2,4,6-Trichlorophenol			2,4-Dichlorophenol		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	860	U	860	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	840	U	840	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	830	U	830	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	840	U	840	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	2,4-Dimethylphenol			2,4-Dinitrophenol			2,4-Dinitrotoluene			2,6-Dinitrotoluene			2-Chloronaphthalene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	860	UJ	860	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	860	UJ	860	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	850	UJ	850	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	850	UJ	850	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	850	U	850	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	840	U	840	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	830	U	830	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	840	U	840	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	2-Chlorophenol			2-Methylnaphthalene			2-Methylphenol (cresol, o-)			2-Nitroaniline			2-Nitrophenol		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	860	U	860	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	840	U	840	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330

Attachment	1	Sheet No.	7 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	0100F-CA-V0315	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	3+4 Methylphenol (cresol, m+p)			3,3'-Dichlorobenzidine			3-Nitroaniline			4,6-Dinitro-2-methylphenol			4-Bromophenylphenyl ether		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	860	U	860	860	U	860	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	860	U	860	860	U	860	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	850	U	850	850	U	850	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	850	U	850	850	U	850	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	860	U	860	860	U	860	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	860	U	860	860	U	860	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	850	U	850	850	U	850	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	840	U	840	840	U	840	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	830	U	830	830	U	830	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	840	U	840	840	U	840	330	U	330

Sample Location	HEIS Number	Sample Date	4-Chloro-3-methylphenol			4-Chloroaniline			4-Chlorophenylphenyl ether			4-Nitroaniline			4-Nitrophenol		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	860	U	860	860	U	860
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	840	U	840	840	U	840
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	830	U	830
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	840	U	840	840	U	840

Sample Location	HEIS Number	Sample Date	Acenaphthene			Acenaphthylene			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	18	J	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	41	J	330	39	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	19	J	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Attachment	1	Sheet No.	8 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	0100F-CA-V0315	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Benzo(b)fluoranthene			Benzo(ghi)perylene			Benzo(k)fluoranthene			Bis(2-chloro-1-methylethyl)ether			Bis(2-Chloroethoxy) methane		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	19	J	330	330	U	330	25	J	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	19	J	330	26	J	330	48	J	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	18	J	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	Bis(2-chloroethyl) ether			Bis(2-ethylhexyl) phthalate			Butylbenzylphthalate			Carbazole			Chrysene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	330	U	330	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	330	U	330	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	860	B	860	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	540	B	540	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	99	JB	330	330	U	330	330	U	330	23	J	330
BCL-B	J15F74	8/14/07	340	U	340	100	JB	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	250	JB	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	61	JB	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	79	JB	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	60	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	33	JB	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	42	JB	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	40	JB	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	37	JB	330	330	U	330	330	U	330	20	J	330
SZ-10	J15F87	8/16/07	330	U	330	120	JB	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	Di-n-butylphthalate			Di-n-octylphthalate			Dibenz[a,h]anthracene			Dibenzofuran			Diethylphthalate		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	39	J	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	25	J	25	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	23	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	25	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	30	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	21	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	26	JB	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	25	JB	330	330	U	330	330	U	330	330	U	330	330	U	330

Attachment	1	Sheet No.	9 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	0100F-CA-V0315	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Dimethyl phthalate			Fluoranthene			Fluorene			Hexachlorobenzene			Hexachlorobutadiene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	26	J	330	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	20	J	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	120	J	120	330	U	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	22	J	330	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	Hexachlorocyclopentadiene			Hexachloroethane			Indeno(1,2,3-cd)pyrene			Isophorone			N-Nitroso-di-n-dipropylamine		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	24	J	330	330	U	330	330	U	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	330	U	330	330	U	330

Sample Location	HEIS Number	Sample Date	N-Nitrosodiphenylamine			Naphthalene			Nitrobenzene			Pentachlorophenol			Phenanthrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350	350	U	350	860	U	860	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
BCL-D	J15F76	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340	340	U	340	840	U	840	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	98	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	330	U	330	330	U	330	830	U	830	330	U	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330	330	U	330	840	U	840	330	U	330

Attachment	1	Sheet No.	10 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	0100F-CA-V0315	Rev. No.	0

Attachment 1. 100-F-26:10 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Phenol			Pyrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-BCL-1	J14CB7	1/22/07	340	U	340	340	U	340
RC-BCL-2	J14CB8	1/22/07	350	U	350	350	U	350
RC-1	J14CB9	1/22/07	340	U	340	340	U	340
RC-2	J14CC0	1/22/07	340	U	340	340	U	340
RC-3	J14CC1	1/23/07	340	U	340	340	U	340
RC-4	J14CC2	1/23/07	340	U	340	340	U	340
BCL-A	J15F73	8/14/07	330	U	330	35	J	330
BCL-B	J15F74	8/14/07	340	U	340	340	U	340
BCL-C	J15F75	8/14/07	330	U	330	20	J	330
BCL-D	J15F76	8/14/07	330	U	330	28	J	330
SZ-1	J15F77	8/14/07	330	U	330	330	U	330
SZ-2	J15F78	8/14/07	340	U	340	340	U	340
SZ-3	J15F79	8/14/07	330	U	330	330	U	330
SZ-4	J15F80	8/14/07	330	U	330	330	U	330
SZ-5	J15F81	8/14/07	330	U	330	110	J	330
SZ-6	J15F82	8/14/07	330	U	330	330	U	330
SZ-7	J15F83	8/16/07	330	U	330	330	U	330
SZ-7 Dup	J15F84	8/16/07	330	U	330	330	U	330
SZ-8	J15F85	8/16/07	330	U	330	330	U	330
SZ-9	J15F86	8/16/07	330	U	330	33	J	330
SZ-10	J15F87	8/16/07	330	U	330	330	U	330

Attachment	1	Sheet No.	11 of 11
Originator	L. D. Habel	Date	10/11/07
Checked	J. M. Capron	Date	
Calc. No.	0100F-CA-V0315	Rev. No.	0

APPENDIX F

DATA QUALITY ASSESSMENT

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample designs (BHI 2004, DOE-RL 2005b, WCH 2007c). This DQA was performed in accordance with site-specific data quality objectives found in the *100 Area Remedial Action Sampling and Analysis Plan* (SAP) (DOE-RL 2005a).

To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical and radiochemical analysis (BHI 2000a, 2000b) are used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., evaluate against cleanup criteria to indicate if remedial action goals have been met). The DQA completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2000).

Confirmatory Sampling

The semivolatile organic compound (SVOC) analyses had the common laboratory contaminants bis(2ethylhexyl)phthalate and di-n-butylphthalate in method blanks (MBs), in the other quality assurance (QA)/quality control (QC) samples, and in field samples. The concentrations observed in the field samples were all similar to the associated method blanks, thus confirming that these results are a laboratory problem and not actually from the field samples themselves. All of the field samples that were observed had concentrations below their required detection limits (RDLs) and should not otherwise impact the data. Therefore, the data were found to be usable for decision-making purposes.

The soil samples (J022T3, J022T4, and J022T5) collected for sample delivery group (SDG) H2851 and analyzed for chlorinated pesticides had method detection limits that were slightly above their RDLs. The values involved were close enough to each other so that if the target analytes were present in the field samples they would have still been detected. They were, however, nondetect, and no impact on the data was observed.

The sediment samples (J022T0 and J022T1) collected from inside junction box covers (SDG H2850) and analyzed for chlorinated pesticides required dilutions of their extracts in order to run on the analytical equipment. Because of dilutions to extracts, the surrogates and matrix spike (MS) concentrations were lost when the analysis was performed. This is a typical result when dilutions are required. The other QA/QC samples had no problems. While the accuracy of the data may be considered low, the data are still usable for decision-making purposes. In addition, the analyte toxaphene is not supported by a QA/QC work up. The data are therefore estimated but usable for decision-making purposes.

In the polychlorinated biphenyl (PCB) analyses for the 100-F-26:10 subsite, some anomalies had high responses for the laboratory control sample (LCS) and high surrogates on one of the samples. In both cases, there was no effect on the field sample data, which remain usable for decision-making purposes.

Because the MSs and laboratory duplicates are prepared using actual material from the field samples, they are subject to natural heterogeneity stemming from those samples. In the metals analysis, the laboratory has performed post-digestion spikes and serial dilutions on MS analytes that do not initially meet criteria to account for that heterogeneity and bring the recovery results back into criteria. For the

laboratory duplicates, the heterogeneity is noted and no further action is required. There is not a negative impact on the sample data.

SDG W04449 consisted of two samples of sediments collected from inside junction box covers and analyzed for hexavalent chromium (samples J022M0 and J022M1). The holding time for these samples was exceeded prior to analysis. However, the analysis for hexavalent chromium did not exceed the analysis holding time in which the data would be rejected, and the data are therefore still usable for decision-making purposes. The extracts of these same two hexavalent chromium samples from SDG W04449 required diluting prior to analysis by the analytical equipment. The associated MSs were diluted causing the MSs to be lost. Post-digestion spikes were also run but failed to bring the MSs back into criteria. There is an implied low bias in the data. All of the field samples were above RDLs and relevant lookup values. The data are usable to show the concentrations are at, and possibly above, the values presented by the laboratory. Because hexavalent chromium values exceed direct exposure levels, hexavalent chromium is considered a contaminant of concern during verification sampling. Other indicators in the data confirm the heterogeneity in these hexavalent chromium field samples but do not otherwise invalidate the data.

Verification Sampling

A review of the sample design (WCH 2007c), the field logbooks (WCH 2007a, 2007b), and applicable analytical data packages has been performed as part of this DQA. All samples were collected per the sample design, with one exception. A duplicate sample for the road-crossing area requested in the verification work instruction (WCH 2007c) was not collected. The criteria are met for field duplicate sample frequency for the waste site per the SAP (DOE-RL 2005a). The samples collected are sufficient to indicate if all remedial action objectives and goals for direct exposure, protection of groundwater, and protection of the Columbia River have been met.

The verification sample data collected at the 100-F-26:10 waste site were provided by the laboratories in five SDGs: SDG K0691 and SDG K0692 from the road-crossing areas and overburden stockpiles, and SDG K0917, SDG K0918, and SDG K0919 from the shallow zone and overburden stockpiles. SDG K0691 was submitted for third-party validation. No major deficiencies were identified in the analytical data sets. Minor deficiencies are discussed below.

SDG K0691

This SDG comprises two field samples from the road-crossing area of the 100-F-26:10 site (J14CB9 and J14CC0) and two samples from the overburden stockpiles (J14CB7 and J14CB8). These samples were analyzed for inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, pesticides, PCBs, SVOCs, nickel-63 by liquid scintillation counting (LSC), total strontium by beta counting, and by gamma spectroscopy. SDG K0691 was submitted for third-party validation. No major deficiencies were found in SDG K0691. Minor deficiencies are as follows:

In the ICP metals analysis, boron and cadmium are reported in the MB at a concentration below the RDL but not less than one-fifth of the concentration reported in the field samples (i.e., the field sample concentration is low enough that the MB concentration is of similar magnitude). All detected boron and cadmium results in SDG K0691 were qualified by third-party validation as undetected estimates and flagged "UJ." The data are acceptable for decision-making purposes.

The LCS recovery for silicon is below QC limits, at 21.3%. Third-party validation qualified all silicon data in SDG K0691 as estimated and flagged "J." Estimated data are usable for decision-making purposes.

Also in the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, antimony, and silicon) are out of acceptance criteria. For aluminum, iron, and silicon, the spiking concentration is insignificant compared to the native concentration in the sample from which the MS was prepared. For these analytes, the deficiency in the MS result is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post-digestion spikes (PDSs) and serial dilutions were prepared for all four analytes with acceptable results. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 53.7%. Antimony results for all samples in SDG K0691 are qualified as estimated and flagged "J" by third-party validation. Estimated data are usable for decision-making purposes.

The relative percent difference (RPD) for silicon is outside QC limits, at 46.3%. The results for silicon were qualified as estimates and flagged "J" by third-party validation. Estimated data are usable for decision-making purposes.

Reported analytical detection levels are compared against the RDLs to ensure that laboratory detection levels meet the required criteria. In the radiochemical analysis, six results exceeded the RDL. Under the Washington Closure Hanford statement of work, no qualification is required.

All of the toxaphene data in SDG K0691 were qualified by third-party validation as estimated with "J" flags, due to lack of a MS, matrix spike duplicate (MSD), or LCS analysis for the analyte. Estimated, or "J"-flagged, data are acceptable for decision-making purposes.

In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the MB. Third-party validation raised the reported values for bis(2-ethylhexyl)phthalate for samples J14CB8 and J14CC0 to the required quantitation limit of 330 µg/kg and qualified them as undetected and flagged "U."

The RPD for 2,4-dinitrophenol is outside QC limits, at 40%. The results for this analyte were qualified as estimates and flagged "J" by third-party validation. Estimated data are usable for decision-making purposes.

SDG K0692

This SDG comprises two field samples from the road-crossing areas of the 100-F-26:10 site (J14CC1 and J14CC2). These samples were analyzed for ICP metals, mercury, pesticides, PCBs, SVOC, nickel-63 by LSC, total strontium by beta counting, and by gamma spectroscopy. No major deficiencies were found in SDG K0692. Minor deficiencies are as follows:

In the SVOC analysis, 1 of 128 MS recoveries is below the acceptance criteria. The MSD for 4--nitrophenol is 35%. MB recoveries are below the acceptance criteria for 4-chloro-3-methylphenol, 2,4 dinitrophenol, 4-nitrophenol, and 4,6-dinitro-2-methylphenol. The results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the MB at levels less than the RDL. The bis (2-ethylhexyl)phthalate sample results for SDG K0692 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the pesticide analysis, insufficient sample volume was available to perform MS QC. All pesticide results for SDG K0692 may be considered estimated. Estimated data are acceptable for decision-making purposes. Blank spike QC was performed with the samples, and all blank spike recoveries were within acceptance criteria.

Due to lack of a MS, MSD, or LCS analysis for toxaphene in the pesticide analysis, all toxaphene results for SDG K0692 may be considered estimated. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, the LCS recovery for silicon is below QC limits, at 21.3%. The silicon data in SDG K0692 may be considered estimated. Estimated data are acceptable for decision-making purposes.

Also in the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, antimony, and silicon) are out of acceptance criteria. For three of these analytes, the spiking concentration is insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS result is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions were prepared for all three analytes with acceptable results. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 69.4%. Antimony results for all samples in SDG K0692 may be considered estimated. Estimated data are usable for decision-making purposes.

The RPDs for silicon and arsenic are outside QC limits, at 31.5%. The elevated RPD is attributed to natural heterogeneity of the sample matrix. The silicon data are usable for decision-making purposes.

The RPD for hexavalent chromium is outside QC limits, at 60.0%. The elevated RPD is attributed to natural heterogeneity of the sample matrix. The hexavalent chromium data are usable for decision-making purposes.

SDG K0917

This SDG comprises four composite samples (J15F73 through J15F76) from the overburden stockpiles and one field sample from the shallow zone excavation of the 100-F-26:10 site (J15F77). These samples were analyzed for ICP metals, mercury, pesticides, PCBs, SVOC, and by gamma spectroscopy. No major deficiencies were found in SDG K0917. Minor deficiencies are as follows:

In the SVOC analysis, the common laboratory contaminants bis(2-ethylhexyl)phthalate and di-n-butylphthalate are detected in the MB at levels less than the RDL. The bis(2-ethylhexyl)phthalate sample results for SDG K0917 may be considered estimated. Estimated data are acceptable for decision-making purposes.

Surrogate recoveries in the SVOC analysis are outside the initial criterion, with high results, for samples J15F73, J15FB1, J15F75, J15F77, and the MB. However, the samples meet the secondary criterion for

surrogate recoveries, as there is no more than one outlier for each sample. The data are acceptable for decision-making purposes.

In the SVOC analysis, 4 of 128 MS recoveries are outside the acceptance criteria. The MSs for 1,2,4-trichlorobenzene and 2-methylnaphthalene are low, at 53% and 59%, respectively. The 2, 4-dinitrophenol MSD is 147% and the 2,6-dinitrotoluene MSD is 115%, both above the acceptance criteria. The results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

One surrogate recovery in the pesticide analysis is outside the initial criterion, with high results, for the sample J15F73 MSD. However, the sample meets the secondary criterion for surrogate recoveries, as there is no more than one outlier. The data are acceptable for decision-making purposes.

Also in the pesticides analysis, the samples required a four-fold instrument dilution due to the sample matrix. The reporting limits were adjusted to reflect the necessary dilution.

All of the toxaphene data in SDG K0917 may be considered estimated due to lack of a MS, MSD, or LCS analysis for the analyte. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, manganese, and silicon) are out of acceptance criteria. For these analytes, the spiking concentration is insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS result is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions were prepared for all four analytes with acceptable results. The data are usable for decision-making purposes.

The RPD for silicon is outside QC limits, at 39.9%. The elevated RPD is attributed to natural heterogeneity of the sample matrix. The silicon data are usable for decision-making purposes.

SDG K0918

This SDG comprises five field samples from the shallow zone excavation of the 100-F-26:10 site (J15F78 through J15F82) and an equipment blank (J15F88). The SDG also includes four samples from the 118-F-5 waste site; however, the results from the 118-F-5 waste site are not included in this data evaluation. Samples J15F78 through J15F82 were analyzed for ICP metals, mercury, pesticides, PCBs, SVOC, and by gamma spectroscopy. Sample J15F88 was analyzed for ICP metals, mercury, and SVOC. No major deficiencies were found in SDG K0918. Minor deficiencies are as follows:

In the SVOC analysis, 1 of 128 MS recoveries is above the acceptance criteria. The MSD for hexachlorocyclopentadiene is 114%. The method blank for 1,2,4-trichlorobenzene is below the acceptance criteria, at 58%. The results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

One surrogate recovery for each sample in the pesticide analysis is outside the initial criterion, with high results. However, the samples meet the secondary criterion for surrogate recoveries, as there is no more than one outlier for each sample. The data are acceptable for decision-making purposes.

Also in the pesticides analysis, the samples required a four-fold instrument dilution due to the sample

matrix. The reporting limits were adjusted to reflect the necessary dilution.

Four of 40 MS recoveries for the pesticides analysis are outside the acceptance criteria. The MS for Endosulfan I and Endosulfan II are high, with both at 121%. The endosulfan sulfate MSD is 43% and the methoxychlor MSD is 22%, both below the acceptance criteria. The MB recovery for 4, 4'-DDE is above the acceptance criteria. The results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

All of the toxaphene data in SDG K0917 may be considered estimated due to lack of a MS, MSD, or LCS analysis for the analyte. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, calcium, sodium, and zinc are reported in the MB at concentrations below the RDL but not less than one-fifth of the concentration reported in some of the field samples (i.e., the field sample concentration is low enough that the MB concentration is of similar magnitude). The calcium, sodium, and zinc results in sample J15F88 (the equipment blank) are less than 20 times the MB and may be considered estimated. The sodium results for all SDG K0918 samples (except J15F78) and the zinc results for samples J15F79 and J15F81 are less than 20 times the MB and may be considered estimated. The data are acceptable for decision-making purposes.

Also in the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, antimony, and silicon) are out of acceptance criteria. For three of these analytes, the spiking concentration is insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS result is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions were prepared for all three analytes with acceptable results. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 68.3%. Antimony results for all samples in SDG K0918 may be considered estimated. Estimated data are usable for decision-making purposes.

The RPD for silicon is outside QC limits, at 35.1%. The elevated RPD is attributed to natural heterogeneity of the sample matrix. The silicon data are usable for decision-making purposes.

The RPD for hexavalent chromium is outside QC limits, at 76.2%. The elevated RPD is attributed to natural heterogeneity of the sample matrix. The hexavalent chromium data are usable for decision-making purposes.

SDG K0919

This SDG comprises five field samples from the shallow zone excavation of the 100-F-26:10 site (J15F83 through J15F87). One field duplicate pair is included in this SDG (J15F83/J15F84). The SDG also includes 10 samples from the 128-F-2 waste site; however, the results from the 128-F-2 waste site are not included in this data evaluation. The 100-F-26:10 samples were analyzed for ICP metals, mercury, pesticides, PCBs, SVOC, and by gamma spectroscopy. No major deficiencies were found in SDG K0919. Minor deficiencies are as follows:

In the SVOC analysis, the common laboratory contaminants bis(2-ethylhexyl)phthalate and di-n-butylphthalate are detected in the MB at levels less than the contract RDL. The bis(2-ethylhexyl)phthalate sample results for SDG K0919 may be considered estimated. Estimated data

are acceptable for decision-making purposes. Due to the presence of bis(2-ethylhexyl)phthalate at elevated limits in the blank, the samples were re-extracted and both results have been reported.

One surrogate recovery in the SVOC analysis is outside the initial criterion, with high results, for sample J15F85. However, the sample meets the secondary criterion for surrogate recoveries, as there is no more than one outlier. The data are acceptable for decision-making purposes.

In the SVOC analysis, four MS recoveries are outside the acceptance criteria. A MS and a MSD for 1,2,4-trichlorobenzene are low, at 53% and 54%, respectively. A MSD for 2,4-dinitrophenol is high, at 129%. A MSD for 3,3'-dichlorobenzidine is 13%, below the acceptance criteria. The results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

Surrogate recoveries in the pesticide analysis are outside the initial criterion, with high results, for samples J15F85 and the MB. However, the samples meet the secondary criterion for surrogate recoveries, as there is no more than one outlier for each. The data are acceptable for decision-making purposes.

The method blank recovery for 4, 4'-DDE is above the acceptance criteria, at 123%. The results for 4, 4'-DDE may be considered estimated. Estimated data are usable for decision-making purposes. In the pesticides analysis, the samples required a four-fold instrument dilution due to the sample matrix. The reporting limits were adjusted to reflect the necessary dilution. All of the toxaphene data in SDG K0917 may be considered estimated due to lack of a MS, MSD, or LCS analysis for the analyte. Estimated data are acceptable for decision-making purposes.

In the ICP metals analysis, sodium and zinc are reported in the MB at a concentration below the RDL but not less than one-fifth of the concentration reported in some of the field samples (i.e., the field sample concentration is low enough that the MB concentration is of similar magnitude). The sodium results for all SDH K0919 samples and the zinc result for sample J15F85 are less than 20 times the MB, and may be considered estimated. The data are acceptable for decision-making purposes.

Also in the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, antimony, and silicon) are out of acceptance criteria. For three of these analytes, the spiking concentration is insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS result is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions were prepared for all three analytes with acceptable results. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 44.4%. Antimony results for all samples in SDG K0919 may be considered estimated. Estimated data are usable for decision-making purposes.

The laboratory duplicate RPDs for barium and lead are outside QC limits, at 32.0% and 50.8%, respectively. The elevated RPDs are attributed to natural heterogeneity of the sample matrix. The data are usable for decision-making purposes.

The laboratory duplicate RPD for hexavalent chromium is outside QC limits, at 37.4%. The elevated RPD is attributed to natural heterogeneity of the sample matrix. The hexavalent chromium data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

RPD evaluations of main sample(s) versus the laboratory duplicate(s) are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field QA/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. The field QA/QC samples for the 100-F-26:10 site, listed in the field logbook (WCH 2007b), are primary and duplicate field samples from the excavation shallow zone (J15F83/J15F84). Field duplicate samples are collected to provide a relative measure of the degree of local heterogeneity in the sampling medium, unlike laboratory duplicates that are used to evaluate precision in the analytical process.

The field duplicates are evaluated by computing the RPD of the duplicate samples for each contaminant of concern. Only analytes with values above five times the detection limits for both the main and duplicate samples are compared. The 95% upper confidence limit calculation brief in Appendix E provides details on duplicate pair evaluation and RPD calculation. None of the RPDs calculated for the analytes in the excavation shallow zone duplicate samples (J15F83/J15F84) are above the acceptance criteria (30%). The data are usable for decision-making purposes.

A secondary check of the data variability is used when one or both of the samples being evaluated (main and duplicate) is less than 5 times the target detection limit, including undetected analytes. In these cases, a control limit of ± 2 times the target detection limit is used (Appendix E) to indicate that a visual check of the data is required by the reviewer. None of the 100-F-26:10 results required this check.

An overall visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The DQA for the 100-F-26:10 waste site determined that the sample design and data are of the right type, quality, and quantity to support site cleanup verification decisions, within specified error tolerances.

Summary

Limited, random, or sample matrix-specific influenced batch QC issues such as those discussed above are a potential for any analysis. The number and types seen in these data sets are within expectations for the matrix types and analyses performed. The DQA review of the 100-F-26:10 confirmatory and verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review concludes that the data are of the right type, quality, and quantity to support the intended use. The verification sample analytical data are stored in the Environmental Restoration project-specific database prior to being submitted for inclusion in the Hanford Environmental Information System database.

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