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Rev. 0

Cleanup Verification Package for the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 Subsite

Prepared for the U.S. Department of Energy by Washington Closure Hanford

August 2016

EXECUTIVE SUMMARY

This cleanup verification package documents completion of remedial action for the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 subsite. The 300-288:2 subsite is located in the 300-FF-2 Operable Unit in the 300 Area of the Hanford Site in southeastern Washington State. Historically, Pit 6 was used as a borrow source for backfill material; however, evidence suggesting a portion of the site was used as a solid waste disposal site was observed. In December 2013, during the excavation of backfill material from Pit 6, subsurface debris was encountered approximately 1.8 to 2.4 m (6 to 8 ft) below original grade. The buried debris consisted of reactor-grade graphite mixed with general construction and demolition materials (e.g., brick concrete, steel, and wood). Limited amounts of lead, tar, and asbestos-containing cement pipe fragments and boiler material were also encountered. Following discovery of the buried debris, the area was added as a subsite to the 300-288 waste site and is identified as 300-288:2.

No historical information was available for the 300-288:2 subsite; therefore, a subsurface investigation plan was developed in April 2015 to characterize the nature and extent of the buried debris. An additional characterization plan was prepared to investigate an area west of the previously characterized area. The information gathered from both investigations was used to support development of a remedial action design for the site.

Remediation of the 300-288:2 subsite was conducted in two stages and has been divided into east half and west half for documentation purposes. Remediation of the east half of the 300-288:2 subsite, herein referred to as 300-288:2 East, began on July 7, 2015, and was completed on January 11, 2016. The depth of the remediation ranged from approximately 2.4 to 4.6 m (8 to 15 ft) below ground surface (bgs), resulting in approximately 87,404 bank cubic meters (BCM) (114,320 bank cubic yards [BCY]) of contaminated soil and debris being disposed at the Environmental Restoration

Disposal Facility. The waste material disposed consisted of soil, fence posts, asphalt, concrete, steel, and miscellaneous construction debris.

Remediation of the west half, herein referred to as 300-288:2 West, began on December 7, 2015, and continued through June 15, 2016. The depth of the remediation ranged from approximately 0.5 to 4.6 m (1.5 to 15 ft) bgs, resulting in approximately 120,795 BCM (157,994 BCY) of contaminated soil and debris being disposed at the Environmental Restoration Disposal Facility. The debris disposed consisted of coal ash, fence posts, asphalt, concrete, steel, and miscellaneous construction debris.

No overburden soil was salvaged from the 300-288:2 subsite and no staging pile areas were utilized.

Following remedial action activities, verification soil samples were collected from 300-288:2 East on March 1 and 2, 2016, and from 300-288:2 West on June 16, 2016. An evaluation of the resulting data found that the waste removal action achieved compliance with the residential scenario remedial action objectives for the 300-288:2 subsite. 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 300-288:2 subsite in accordance with TPA-MP-14, *Tri-Party Agreement Handbook Management Procedures* (DOE-RL 2011).

The current site conditions have been evaluated in accordance with the *Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils* (DOE-RL 2016) to demonstrate attainment of the remedial action objectives and the corresponding cleanup levels for residential land use established in the *Hanford Site 300 Area, Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1, Hanford Site, Benton County, Washington* (EPA 2013).

Table ES-1. Summary of Attainment of Remedial Action Objectives for the 300-288:2 Waste Site. (2 Pages)

Regulatory Requirement	Cleanup Levels	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain individual radionuclide CULs and attain radionuclide total excess cancer risk of <1 x 10^{-4} over 1,000 years or a dose of <15 mrem/yr, whichever is lower.	Residual radionuclide activities for the 300-288:2 subsite were all below individual CULs. Uranium isotopes were the only radionuclides detected that were subject to the sum-of-fractions calculations. After subtracting the background values for the uranium isotopes, the values were zero; therefore, no further calculations were performed. The 300-288:2 subsite meets the requirement of <1 x 10^{-4} over 1,000 years or a dose of <15 mrem/yr.	Yes
Direct Exposure – Nonradionuclides	Attain individual COC direct exposure CULs.	All individual COC concentrations for all 300-288:2 subsite decision units are below the residential direct exposure CULs.	Yes
Nonradionuclide Risk Requirements	Attain a hazard quotient of <1 for all individual noncarcinogens.	All hazard quotients for individual nonradionuclide COCs are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotient for 300-288:2 subsite is 2.70 x 10^{-2}, which is <1.	
	Attain an excess cancer risk of <1 x 10^{-6} for residential land use for individual carcinogens.	The excess cancer risk values for individual carcinogenic COCs for 300-288:2 subsite are <1 x 10^{-6}.	
	Attain a total excess cancer risk of <1 x 10^{-5} for carcinogens.	The total excess cancer risk for 300-288:2 subsite is 8.63 x 10^{-7}, which is <1 x 10^{-5}.	
Groundwater/River Protection – Radionuclides	Attain single radionuclide COC groundwater and river protection CULs.	All single radionuclide COCs were quantified below groundwater/river protection CULs.	Yes
	Attain National Primary Drinking Water Standards: 4 mrem/yr (beta/gamma) dose rate to target receptors/organs [a].	All single radionuclide COCs were quantified below groundwater/river protection CULs.	
	Meet drinking water MCL for alpha emitters.	No alpha-emitting radionuclide COCs were quantified above groundwater/river protection CULs.	
	Meet total uranium drinking water standard of 30 µg/L MCL [b].	Residual concentrations of total uranium are less than CULs for uranium metal in Appendix C, Table C-1 of the 300-FF-2 RDR/RAWP (DOE-RL 2016).	

Table ES-1. Summary of Attainment of Remedial Action Objectives for the 300-288:2 Waste Site. (2 Pages)

Regulatory Requirement	Cleanup Levels	Results	Remedial Action Objectives Attained?
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river CULs.	All individual COC concentrations are below soil CULs for the protection of groundwater and the Columbia River.	Yes

[a] "National Primary Drinking Water Regulations" (40 CFR 141).
[b] Based on the isotopic distribution of uranium in the Hanford Site background, the 30 µg/L uranium MCL (40 CFR 141.66) corresponds to 21.2 pCi/L. Concentration-to-activity calculations are documented in *Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater* (BHI 2001).

COC = contaminant concern
CUL = cleanup level
MCL = maximum contaminant level (drinking water standard)
RDR/RAWP = remedial design report/remedial action work plan

In accordance with the *Explanation of Significant Differences #2 for the Hanford Site 300 Area Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1* (EPA 2016), the 300-288:2 subsite will not be backfilled as it is located in a borrow pit (Hanford Pit 6) which will continue to be used for borrow material.

The 300-288:2 subsite meets the cleanup standards and has been reclassified as Final Closed Out in accordance with the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989) and the Waste Site Reclassification Guideline TPA-MP-14 (RL-TPA-90-0001) (DOE-RL 2011). A copy of the reclassification form for the 300-288:2 subsite is included as part of the Executive Summary of this document.

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 300-FF-2 **Control No.:** 2016-008

Waste Site Code(s)/Subsite Code(s): 300-288:2

Reclassification Category: Interim ☐ Final ☒

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

Approvals Needed: DOE ☒ Ecology ☐ EPA ☒

Description of current waste site condition:

The 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 subsite, is located within the 300-FF-2 Operable Unit and is identified as a waste site requiring remediation in the *Hanford Site 300 Area, Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1, Hanford Site, Benton County, Washington* (300 Area ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2013). The selected remedy was modified in the *Explanation of Significant Differences #2 for the Hanford Site 300 Area Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1* U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2016) such that the 300-288:2 subsite will not require backfill.

Remediation of the 300-288:2 subsite was conducted between July 2015 and June 2016. Approximately 208,199 bank cubic meters (27,2314 bank cubic yards) of excavated materials were removed from the excavation and disposed at the Environmental Restoration Disposal Facility.

The selected remedy involved (1) excavating the site to the extent required to meet residential soil cleanup levels (CULs), (2) disposing of contaminated excavation materials at the Environmental Restoration Disposal Facility, (3) demonstrating through verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification as Final Closed Out.

Basis for reclassification:

Following remediation, verification sampling for the 300-288:2 subsite was conducted on March 1 and 2, 2016, and June 16, 2016. The sample results were evaluated in comparison to the CULs from the 300 Area ROD (EPA 2013) and the *Remedial Design Report/Remedial Action Work Plan for the 300-FF-2 Soils* (300-FF-2 RDR/RAWP), DOE/RL-2014-13-ADD1, Rev. 1, U.S. Department of Energy, Richland Operations Office (DOE-RL 2016). In accordance with this evaluation, the verification sampling results support a reclassification of the 300-288:2 subsite to Final Closed Out. The current site conditions achieve the CULs and remedial action objectives established by the 300 Area ROD (EPA 2013) and the 300-FF-2 RDR/RAWP (DOE-RL 2016). The waste site was remediated to achieve cleanup levels for a residential land use scenario and to protect groundwater and the Columbia River. The results of verification sampling show that residual contaminant concentrations meet human health direct exposure cleanup levels for residential land use and applicable standards for groundwater and river protection in the shallow zone (i.e., surface to 4.6 m [15 ft] deep). The contamination in the vadose zone was removed to meet the residential cleanup levels. Because the site has met unlimited use and unrestricted exposure CULs, no institutional controls are required. The basis for reclassification is described in detail in the *Cleanup Verification Package for the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 Subsite* (attached).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 300-FF-2 **Control No.:** 2016-008

Waste Site Code(s)/Subsite Code(s): 300-288:2

Regulator comments:

Waste Site Controls:

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

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

This site has met the unlimited use and unrestricted exposure CULs.

M. French DOE Federal Project Director (printed)	M. French Signature	8/5/16 Date
NA Ecology Project Manager (printed)	Signature	Date
B. Simes EPA Project Manager (printed)	Signature	8/11/16 Date

A-6006-136 (REV 0)

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ACRONYMS AND ABBREVIATIONS

BCM	bank cubic meter
BCY	bank cubic yard
bgs	below ground surface
COC	contaminant of concern
CUL	cleanup level
DQA	data quality assessment
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
GPERS	Global Positioning Environmental Radiological Surveyor
PAH	polycyclic aromatic hydrocarbons
RAO	remedial action objective
RDR/RAWP	remedial design report/remedial action work plan
ROD	record of decision
SAP	sampling and analysis plan
UCL	upper confidence limit

1.0 INTRODUCTION

This cleanup verification package documents that the 300-288:2, Undocumented Disposal Site Within Pit 6 subsite was remediated in accordance with the *Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1, Hanford Site, Benton County, Washington* (300 Area ROD) (EPA 2013). Remedial action objectives (RAOs) and associated cleanup levels (CULs) for this site are documented in the 300 Area ROD (EPA 2013) and the *Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils* (300-FF-2 RDR/RAWP) (DOE-RL 2016). The 300 Area ROD provides the U.S. Department of Energy, Richland Operations Office the authority, guidance, and objectives to conduct this remedial action.

The remedy specified in the 300 Area ROD (EPA 2013) and conducted for the 300-288:2 subsite included excavating the site to the extent required to meet residential soil CULs and disposing of contaminated excavation materials at the Environmental Restoration Disposal Facility (ERDF) in the 200 Area of the Hanford Site. Excavation was driven by RAOs for direct exposure, protection of groundwater, and protection of the Columbia River. The selected remedy was modified in the *Explanation of Significant Differences #2 for the Hanford Site 300 Area Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision amendment for 300-FF-1* (EPA 2016) such that the 300-288:2 site will not be backfilled following remediation.

2.0 SITE DESCRIPTION AND SUPPORTING INFORMATION

2.1 DESCRIPTION

The 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 subsite was described as having significant amounts of buried debris, 1.8 to 2.4 m (6 to 8 ft) below ground surface, and was encountered as deep as 6 m (20 ft) below the original grade. The 300-288:2 subsite is located within the northeastern boundary of borrow Pit 6, immediately west of Route 4S and the 300 Area (Figure 1).

2.2 HISTORY

Historically, Pit 6 was used as a borrow source for backfill material; however, evidence suggesting the site may have been used as a solid waste disposal site was observed. In December 2013, during the excavation of backfill material from Pit 6, debris was encountered approximately 1.8 to 2.4 m (6 to 8 ft) below original grade. The debris included reactor grade graphite, acid/thermal brick, and large concrete and steel debris. Limited amounts of lead and asbestos pipe fragments and boiler material were also observed to be present. A historical records search found no documentation of a solid waste disposal site within Pit 6. A photograph of Pit 6 is provided in Figure 2.

Figure 1. The 300-288:2 Subsite Overall Site Location Map.

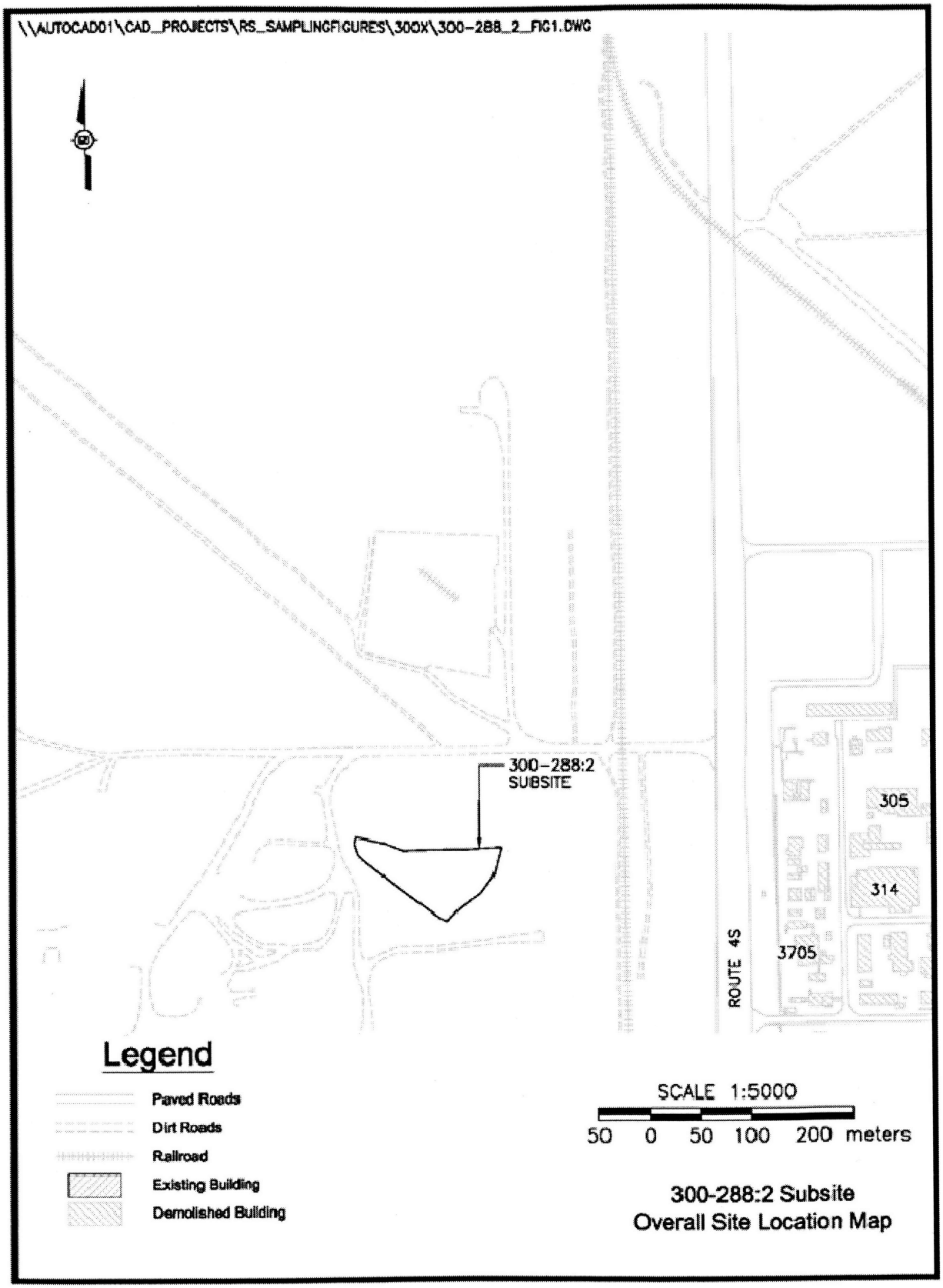


Figure 2. Aerial Photograph of Pit 6, Before Waste Site Remediation.

Following the discovery of the buried debris, the area was added as a subsite to the 300-288 waste site and was identified as 300-288:2.

3.0 SITE CHARACTERIZATION

3.1 SITE CHARACTERIZATION

The lack of significant historical information and process knowledge for the 300-288:2 subsite led to the development of a characterization plan designed to collect data to serve as a basis for a remedial design. The subsurface investigation plan and the results of the investigation are documented in the *Characterization Report for the 300-288:2 Waste Site* (WCH 2015b).

An additional subsurface investigation was conducted west of the previously characterized area per the "300-288:2 Phase II Investigation Plan" (WCH 2015a). The results of the investigation are documented in the *Characterization Report for the 300-288:2 Waste Site, Phase II Investigation Area* (WCH 2015c). The information gathered from both investigations was used to support development of a remedial action design for the site.

3.2 GEOPHYSICAL SURVEY

A geophysical survey was performed at the 300-288:2 Undocumented Disposal Site Within Gravel Pit 6 subsite in November 2014. Significant amounts of subsurface metallic debris were detected over a relatively large area. Metallic and nonmetallic surface debris were observed as well. Survey results show subsurface debris to be concentrated in several areas (WCH 2015b).

An additional survey was conducted of the western extension of 300-288:2 subsite in May 2015. Subsurface metallic debris was detected over most of the area, but in lesser concentrations than seen at the original investigation area. Metallic and nonmetallic surface debris were observed as well. Concentrated subsurface debris was detected in several areas (WCH 2015a).

4.0 REMEDIAL ACTION SUMMARY

4.1 EXCAVATION AND DISPOSAL

Remediation of the 300-288:2 subsite was conducted in two stages and has been divided into an eastern half and a western half for sampling purposes. Remediation of the eastern half of the 300-288:2 subsite, herein referred to as 300-288:2 East, began on July 7, 2015, and was completed on January 11, 2016. The depth of the remediation ranged from 2.4 to 4.6 m (8 to 15 ft) below ground surface (bgs). An estimated 87,404 bank cubic meters (BCM) (114,320 bank cubic yards [BCY]) of contaminated soil and debris were removed from the excavation and disposed at ERDF. The debris consisted of fence posts, asphalt, concrete, steel, and other miscellaneous construction debris. A post-remediation photograph is provided in Figure 3.

Remediation of the western half, herein referred to as 300-288:2 West, began on December 7, 2015, and was completed on June 15, 2016. The depth of the remediation ranged from 0.5 to 4.6 m (1.5 to 15 ft) bgs. An estimated 120,795 BCM (157,994 BCY) of contaminated soil and debris were removed from the excavation and disposed at ERDF. The debris consisted of fence posts, asphalt, concrete, steel, and other miscellaneous construction debris. Coal ash was also observed in the excavation during remediation. A photograph taken during remediation is provided in Figure 4.

All material was direct loaded from the excavation into ERDF cans for disposal; therefore, no waste staging pile areas were created. Additionally, no overburden material was segregated during excavation. No anomalies or areas of stained soil were observed during remediation of either the eastern or the western half of the waste site.

Figure 3. Photograph of the 300-288:2 East Post-Remediation.

Figure 4. Photograph of the 300-288:2 West During Remediation.

4.2 RADIOLOGICAL SURVEYS

Global Positioning Environmental Radiological Surveyor (GPERS) surveys were performed following site remediation. The beta and gamma track maps for the 300-288:2 East and 300-288:2 West are provided in Figures 5 through 8, respectively. No elevated radiological activity was detected.

4.3 POST-EXCAVATION TOPOGRAPHIC SURVEYS

A post-excavation civil survey was performed at the 300-288:2 East and 300-288:2 West and are provided in Figures 9 and 10, respectively. No elevated radiological contamination was detected.

5.0 VERIFICATION SAMPLING ACTIVITIES

Verification sampling for 300-288:2 East was performed on March 1 and 2, 2016, and for 300-288:2 West on June 16, 2016, per the *Work Instruction for Verification Sampling of the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 Subsite* (WCH 2016). The sampling was conducted to support a determination that residual contaminant concentrations at this site meet the cleanup criteria specified in the 300-FF-2 RDR/RAWP (DOE-RL 2016) and the 300 Area ROD (EPA 2013). The following subsections provide additional discussion of the information used to develop the verification sampling designs.

5.1 CONTAMINANTS OF CONCERN FOR VERIFICATION SAMPLING

5.1.1 300-288:2 Subsite Contaminants of Concern

The contaminants of concern (COCs) identified for the 300-288:2 subsite were determined based on the type of debris encountered at the site and the characterization and in-process samples collected prior to and during remediation. The COCs include antimony, arsenic, barium, beryllium, cadmium, copper, lead, lithium, manganese, mercury, nickel, selenium, silver, uranium, vanadium, zinc, benzo(a)pyrene, chrysene, total petroleum hydrocarbons, aroclor-1254, aroclor-1260, uranium-234, uranium-235, uranium-238, europium-154, and europium-155.

The final list of analyses for verification sampling included inductively coupled plasma metals, mercury, semivolatile organic analysis, polychlorinated biphenyls, total petroleum hydrocarbons, gamma energy analysis, and isotopic uranium. The analytical methods that were used to evaluate the COCs and other constituents are included in Table 1.

Figure 5. The 300-288:2 East GPERS Survey Beta Track Map.

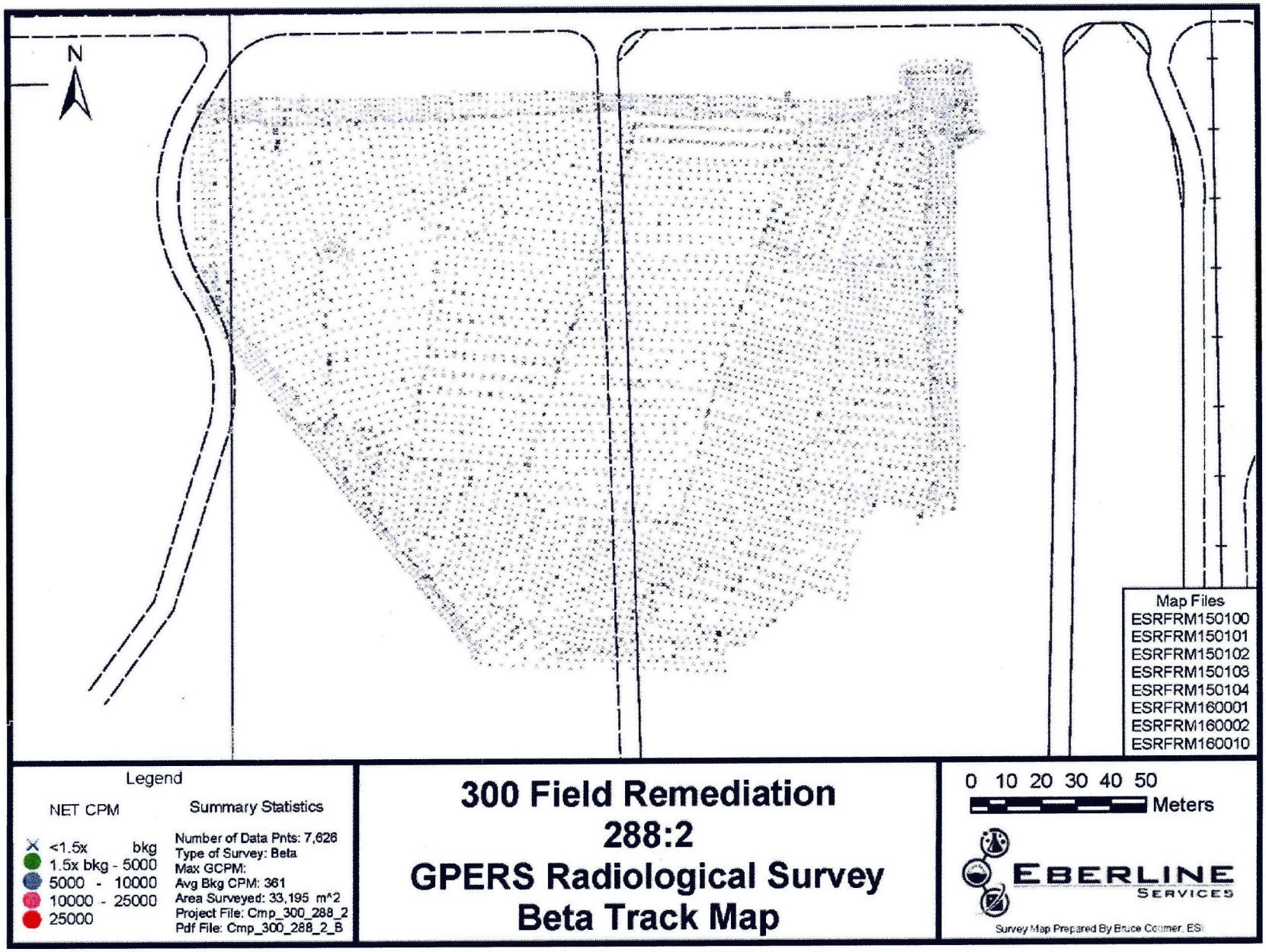
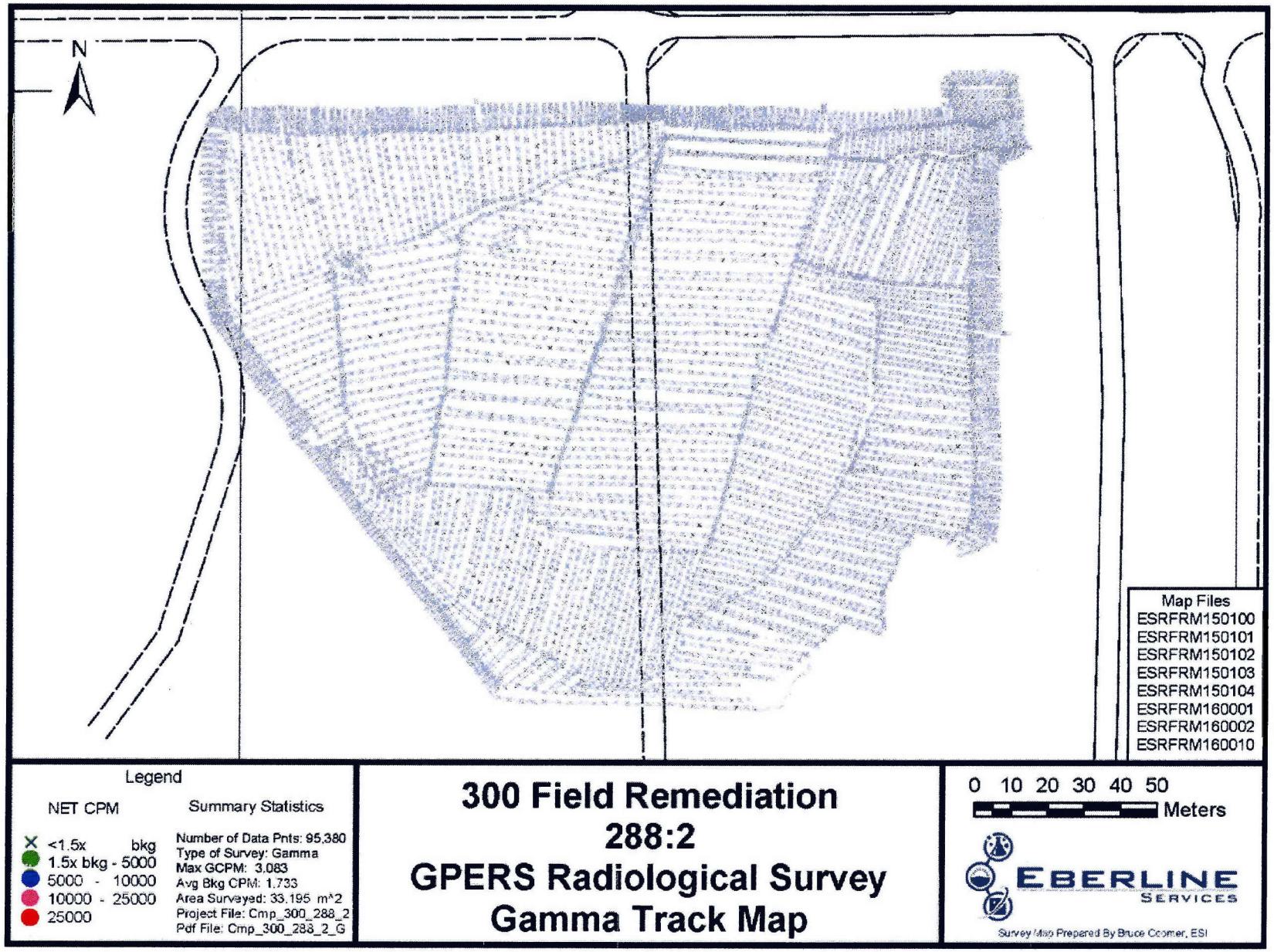


Figure 6. The 300-288:2 East GPERS Survey Gamma Track Map.



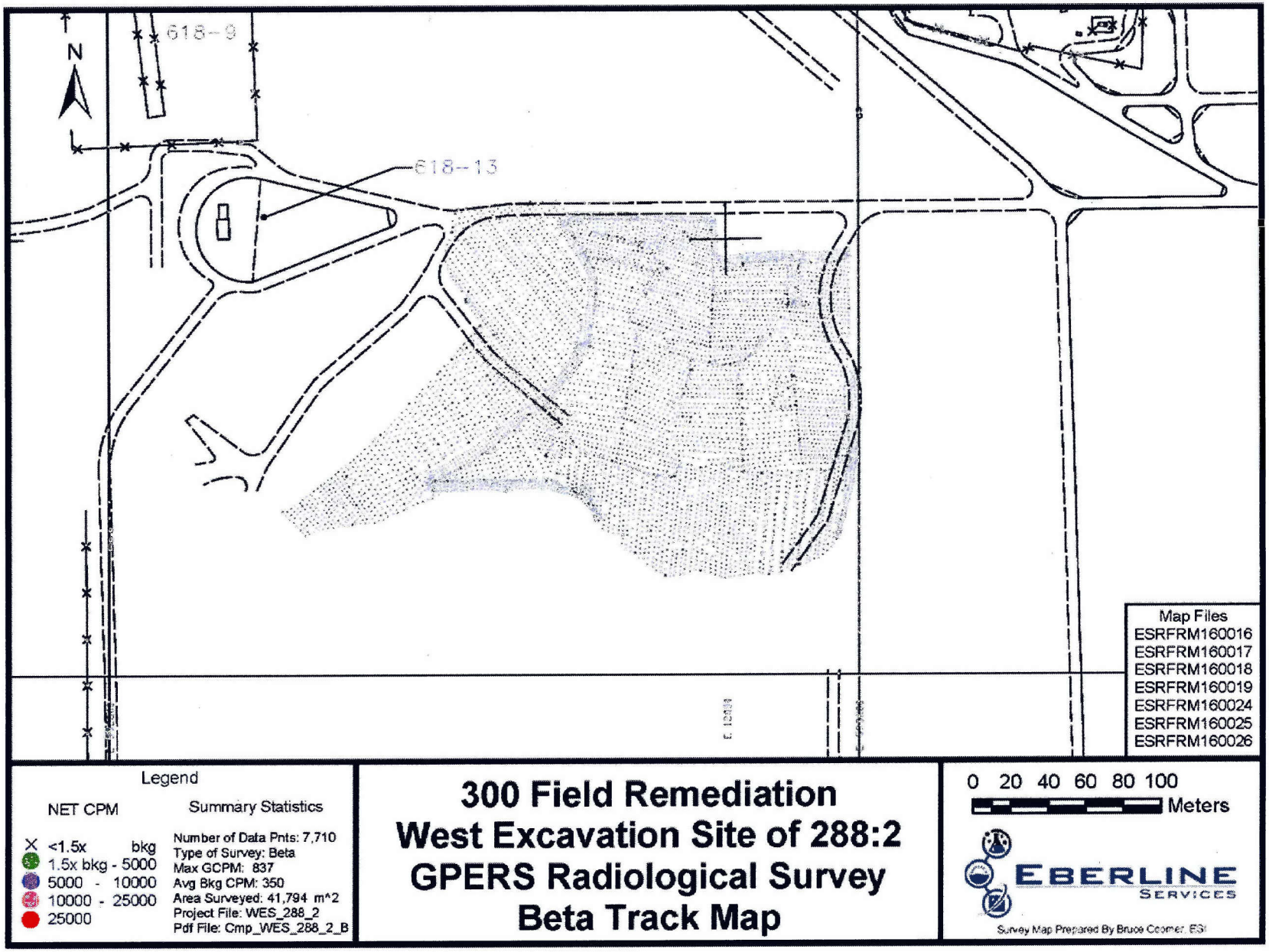


Figure 7. The 300-288:2 West GPERS Survey Beta Track Map.

Figure 8. The 300-288:2 West GPERS Survey Gamma Track Map.

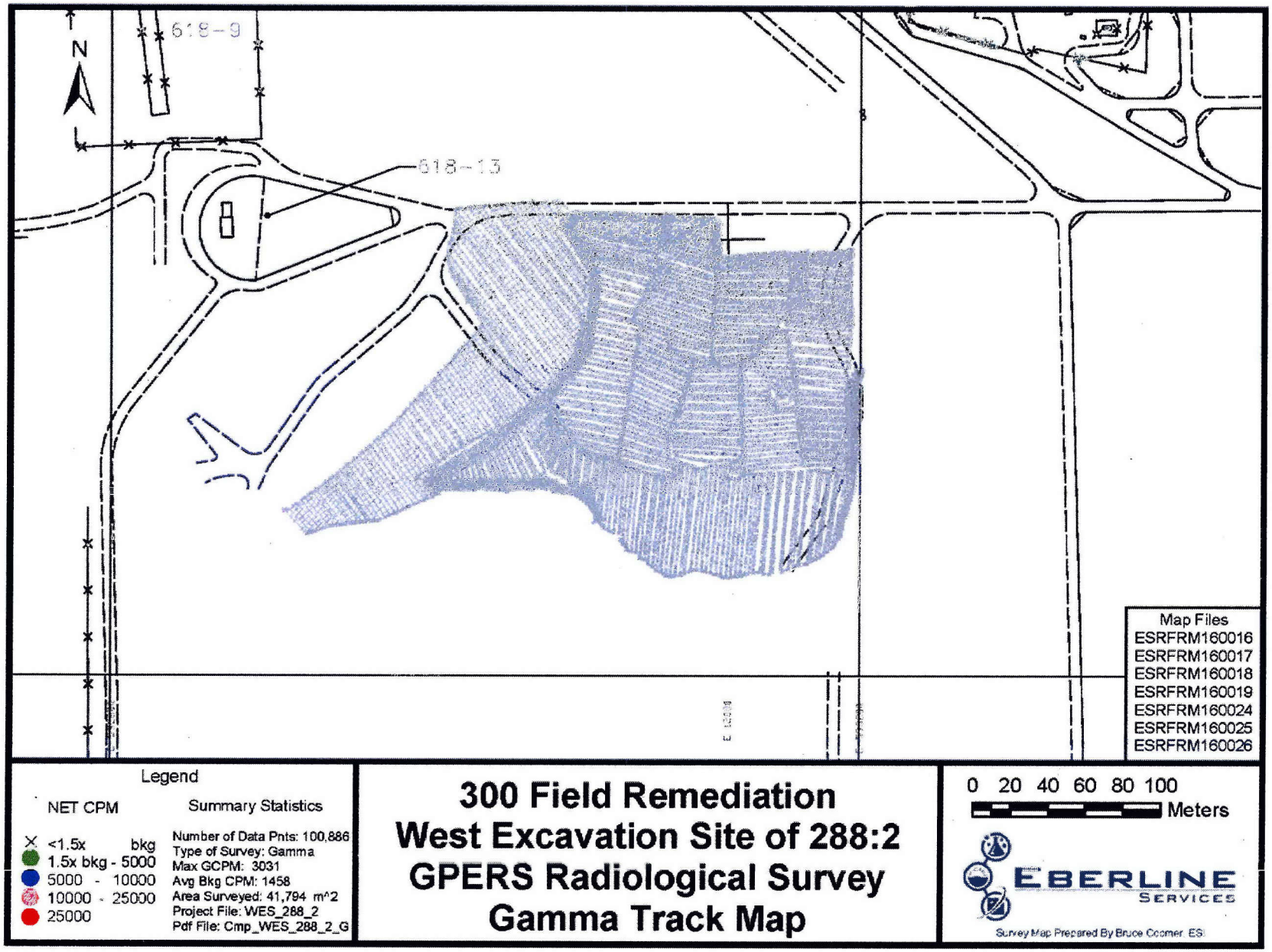


Figure 9. The 300-288:2 East Post-Excavation Civil Survey.

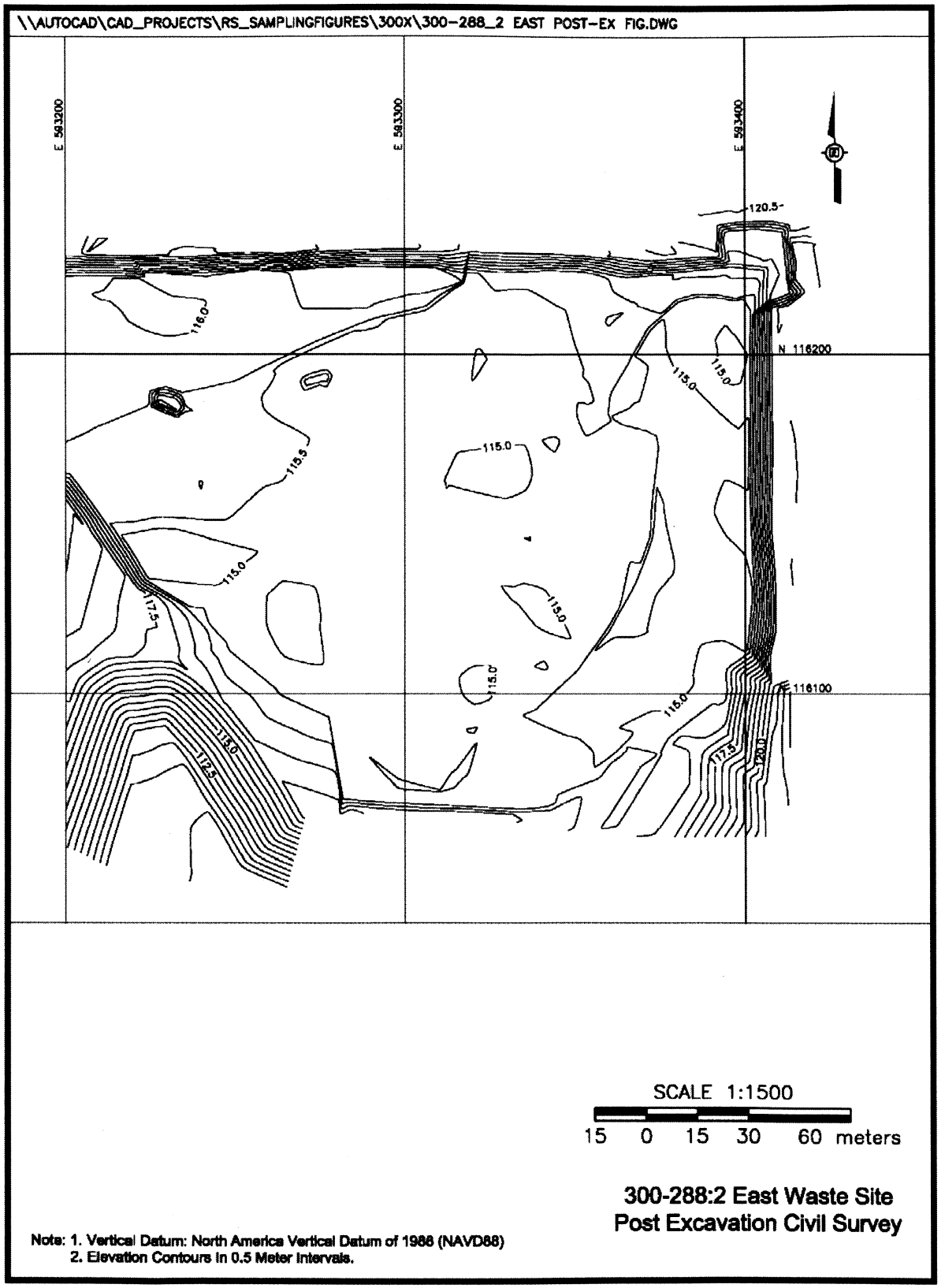


Figure 10. The 300-288:2 West Post-Excavation Civil Survey.

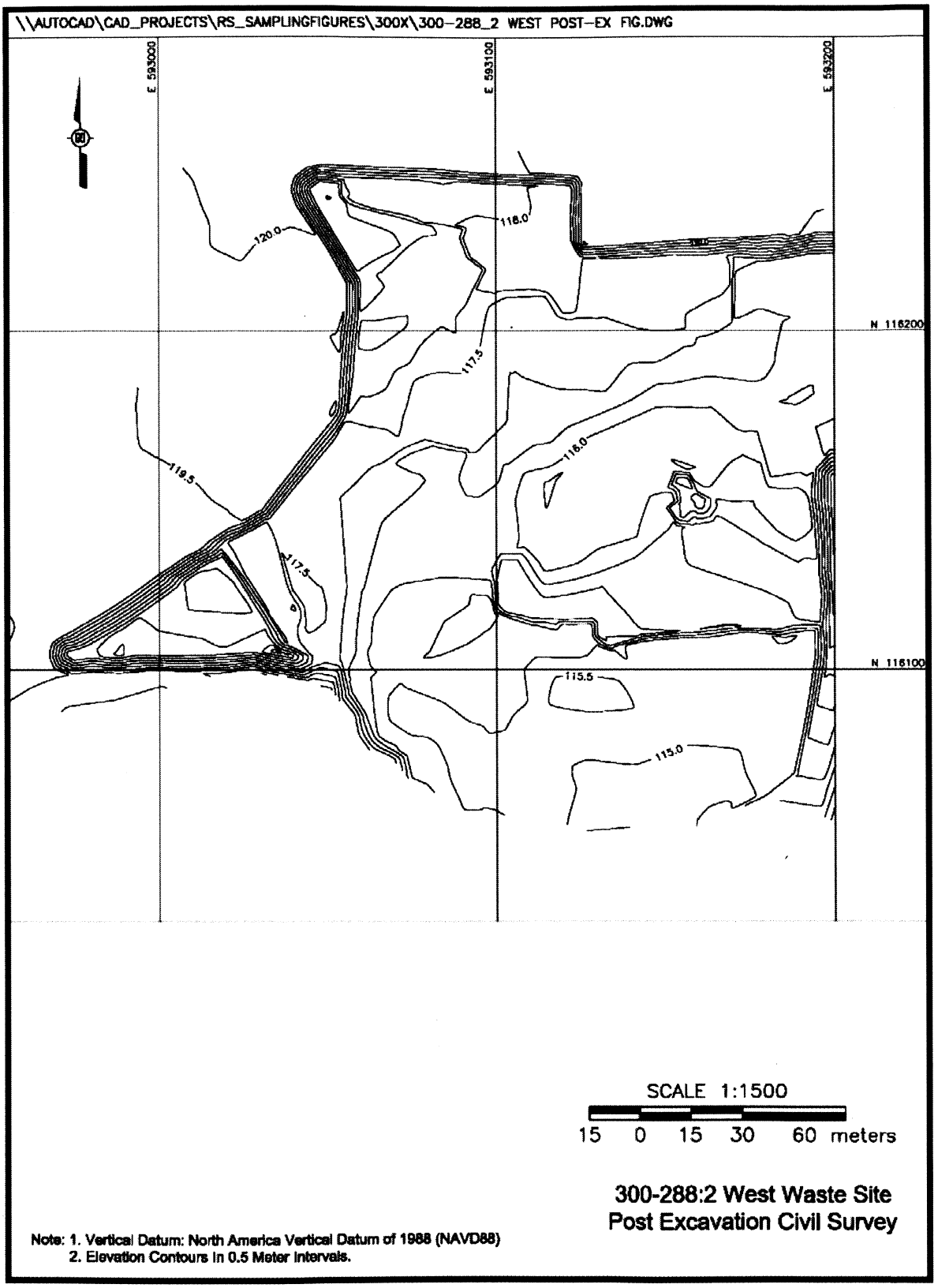


Table 1. The 300-288:2 Subsite Laboratory Analytical Methods and Contaminants of Concern.

Analytical Method	Contaminant of Concern
ICP metals [a] – EPA Method 6010	Antimony, arsenic, barium, beryllium, cadmium, copper, lead, lithium, manganese, mercury, nickel, selenium, silver, uranium, vanadium, and zinc
Mercury – EPA Method 7471	Mercury
PCBs – EPA Method 8082	Aroclor-1254 and aroclor-1260
SVOA – EPA Method 8270	Benzo(a)pyrene and chrysene
TPH – NWTPH-Dx	Total petroleum hydrocarbons (diesel range and diesel range extended)
GEA – gamma spectroscopy	Cesium-137, cobalt-60, europium-152, europium-154, and europium-155
Isotopic uranium – AEA	Uranium-233/234, uranium-235, uranium-238

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

AEA = alpha energy analysis
EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
ICP = inductively coupled plasma
NWTPH-DX = Northwest total petroleum hydrocarbons – diesel range organics
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

5.2 VERIFICATION SAMPLING DESIGN SELECTION AND BASIS

This section describes the basis for selection of an appropriate sample design and determination of the number of verification samples that were collected.

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 (UCL) on the sample mean, with the CUL. Therefore, a statistical sampling design was the preferred verification sampling approach for the 300-288:2 subsite because the distribution of potential residual soil contamination over the site is uncertain. The Washington State Department of Ecology (Ecology) publication *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) recommends that systematic sampling with sample locations distributed over the entire study area be used. This sampling approach is referred to by Ecology as "area-wide sampling." Therefore, sampling locations were distributed over the footprint of the excavation area using a random-start systematic grid in an effort to determine the potential presence of residual contamination. Statistical parameters (i.e., standard deviation within the populations) for residual contaminant levels following remediation at the 300-288:2 subsite were estimated based on assumptions of residual contamination after remediation. These assumptions were verified using the resulting verification sampling data and considered in the data quality assessment (DQA) for the data set.

5.2.1 300-288:2 Verification Sampling Design

The 300-288:2 subsite was divided into two decision units for verification sampling and consisted of the east and west portions of the remediation. Each decision unit was further divided into sample areas and consisted of East Sample Area 1 (ESA1), East Sample Area 2 (ESA2), West Sample Area 1 (WSA1), and West Sample Area 2 (WSA2). A statistical sampling design was used to evaluate each sample area. The remediation design boundary was delineated in the Visual Sample Plan[1] and used as the basis for the location of a random-start systematic grid for verification soil sampling. A triangular grid was selected for this investigation based on studies that indicate triangular grids are superior to square grids (Gilbert 1987).

Twelve statistical verification soil samples plus one duplicate and one split soil sample were collected from each sample area, and one equipment blank sample was collected from each decision unit. Additionally, four focused samples were collected from ESA1, three from locations where in-process samples detected contaminates above direct exposure CULs, and one from a location where elevated radiological activity was identified during remediation. The sample summaries for the eastern and western half are provided in Tables 2 and 3, respectively. The sampling locations for the eastern and western half are shown in Figures 11 and 12, respectively.

5.2.2 Verification Sampling

The soil sample locations were global positional surveyed and staked prior to sample collection using the coordinate pairs provided in Tables 2 and 3. A discrete grab soil sample was collected at each designated sample point (0 to 0.15 m [0 to 6 in.] below the surface of the excavated site).

All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the *300 Area Remedial Action Sampling and Analysis Plan* (300 Area SAP) (DOE-RL 2014). All samples were submitted for full protocol laboratory analysis using approved U.S. Environmental Protection Agency (EPA) analytical methods as required per the 300 Area SAP (DOE-RL 2014).

6.0 SAMPLING RESULTS

6.1 STATISTICAL AND FOCUSED SAMPLE RESULTS

The laboratory-reported verification sample results for all constituents are stored in a Washington Closure Hanford project-specific database prior to archival in the Hanford Environmental Information System, and are presented as an attachment to the 95% UCL calculations (Appendix A).

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

Table 2. 300-288:2 East Verification Sample Summary Table.

Sample Location	HEIS Sample Number	Northing	Easting	Sample Analysis
ESA1-1	J1V8F2	116094.7	593263.4	ICP metals [a], mercury, PCBs, SVOA, TPH, pH, GEA, isotopic uranium
ESA1-2	J1V8F3	116074.2	593296.5	
ESA1-3	J1V8F4	116174.6	593198.3	
ESA1-4	J1V8F5	116154.1	593231.4	
ESA1-5	J1V8F6	116133.6	593264.6	
ESA1-6	J1V8F7	116113.1	593297.7	
ESA1-7	J1V8F8	116213.5	593199.5	
ESA1-8	J1V8F9	116193.0	593232.6	
ESA1-9	J1V8H0	116172.5	593265.7	
ESA1-10	J1V8H1	116152.1	593298.9	
ESA1-11	J1V8H2	116211.5	593266.9	
ESA1-12	J1V8H3	116191.0	593300.0	
Duplicate of ESA1-7	J1V8H4	116213.5	593199.5	
Split of ESA1-7	J1V8K2	116213.5	593199.5	
FS-1	J1V8H5	116092.0	593309.0	
FS-2	J1V8H6	116094.0	593309.0	
FS-3	J1V8H7	116091.0	593313.0	
FS-4	J1V8H8	116130.0	593270.0	
Equipment blank	J1V8F1	NA	NA	ICP metals [a], mercury
ESA2-1	J1V8H9	116081.0	593326.6	ICP metals [a], mercury, PCBs, SVOA, TPH, pH, GEA, isotopic uranium
ESA2-2	J1V8J0	116081.0	593365.3	
ESA2-3	J1V8J1	116114.5	593345.9	
ESA2-4	J1V8J2	116114.5	593384.6	
ESA2-5	J1V8J3	116148.0	593326.6	
ESA2-6	J1V8J4	116148.0	593365.3	
ESA2-7	J1V8J5	116148.0	593404.0	
ESA2-8	J1V8J6	116181.6	593345.9	
ESA2-9	J1V8J7	116181.6	593384.6	
ESA2-10	J1V8J8	116215.1	593326.6	
ESA2-11	J1V8J9	116215.1	593365.3	
ESA2-12	J1V8K0	116215.1	593404.0	
Duplicate of ESA2-3	J1V8K1	116114.5	593345.9	
Split of ESA2-3	J1V8K3	116114.5	593345.9	

[a] The expanded list of ICP metals included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium (total), cobalt, copper, iron, lead, lithium, magnesium, manganese, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium, tin, uranium, vanadium, zinc, and zirconium in the analytical results package.

GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PCB = polychlorinated biphenyl
pH = hydrogen ion concentration
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Table 3. 300-288:2 West Verification Sample Summary Table.

Sample Location	HEIS Sample Number	Northing	Easting	Sample Analysis
WSA1-1	J1V902	116118.6	592924.7	ICP metals [a], mercury, PCBs, SVOA, TPH, pH, GEA, isotopic uranium
WSA1-2	J1V903	116137.1	592951.2	
WSA1-3	J1V904	116104.9	592954.0	
WSA1-4	J1V905	116155.6	592977.7	
WSA1-5	J1V906	116123.4	592980.6	
WSA1-6	J1V907	116238.7	592998.7	
WSA1-7	J1V908	116206.4	593001.5	
WSA1-8	J1V909	116174.2	593004.3	
WSA1-9	J1V910	116142.0	593007.1	
WSA1-10	J1V911	116225.0	593028.0	
WSA1-11	J1V912	116192.7	593030.8	
WSA1-12	J1V913	116160.5	593033.6	
Duplicate of WSA1-1	J1V914	116118.6	592924.7	
Split of WSA1-1	J1V928	116118.6	592924.7	
WSA2-1	J1V915	116115.5	593002.1	ICP metals [a], mercury, PCBs, SVOA, TPH, pH, GEA, isotopic uranium
WSA2-2	J1V916	116075.5	593097.5	
WSA2-3	J1V917	116146.8	593043.3	
WSA2-4	J1V918	116126.8	593091.0	
WSA2-5	J1V919	116106.7	593138.7	
WSA2-6	J1V920	116086.7	593186.4	
WSA2-7	J1V921	116178.1	593084.5	
WSA2-8	J1V922	116158.1	593132.2	
WSA2-9	J1V923	116138.0	593179.9	
WSA2-10	J1V924	116229.4	593078.0	
WSA2-11	J1V925	116209.4	593125.7	
WSA2-12	J1V926	116189.4	593173.4	
Duplicate of WSA2-10	J1V927	116229.4	593078.0	
Split of WSA2-10	J1V929	116229.4	593078.0	
Equipment blank	J1V901	NA	NA	ICP metals [a], mercury

[a] The expanded list of ICP metals included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium (total), cobalt, copper, iron, lead, lithium, magnesium, manganese, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium, tin, uranium, vanadium, zinc, and zirconium in the analytical results package.

GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PCB = polychlorinated biphenyl
pH = hydrogen ion concentration
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Figure 11. The 300-288:2 East Verification Sample Locations.

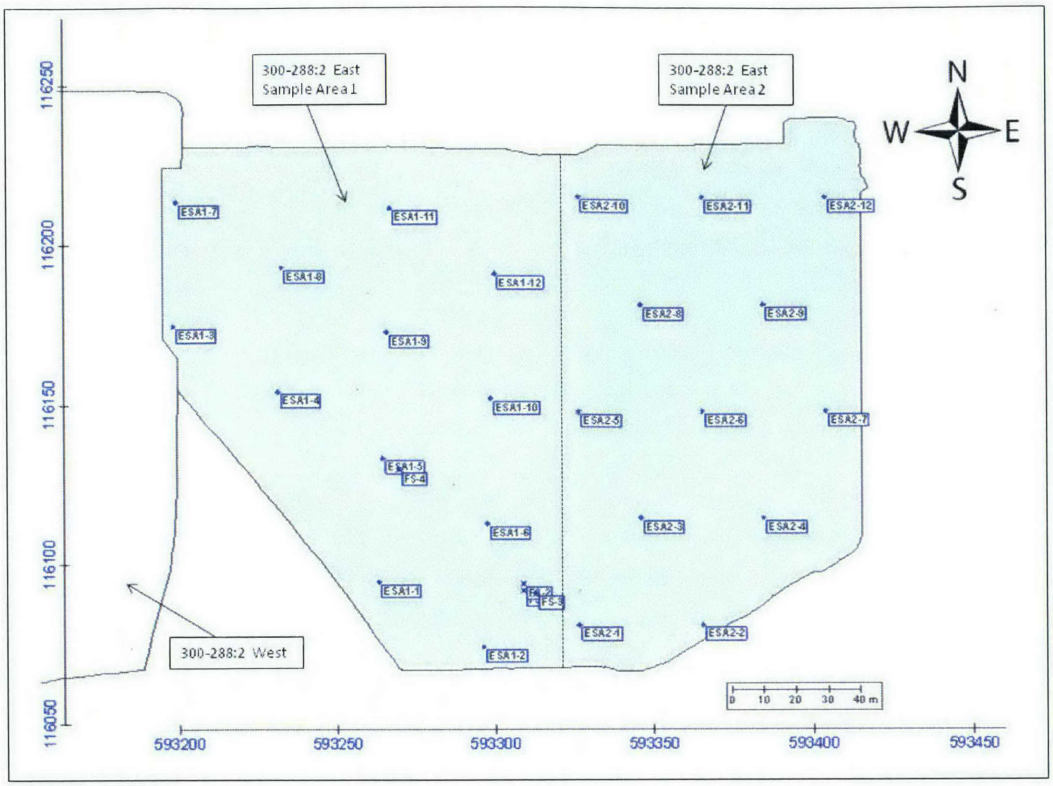
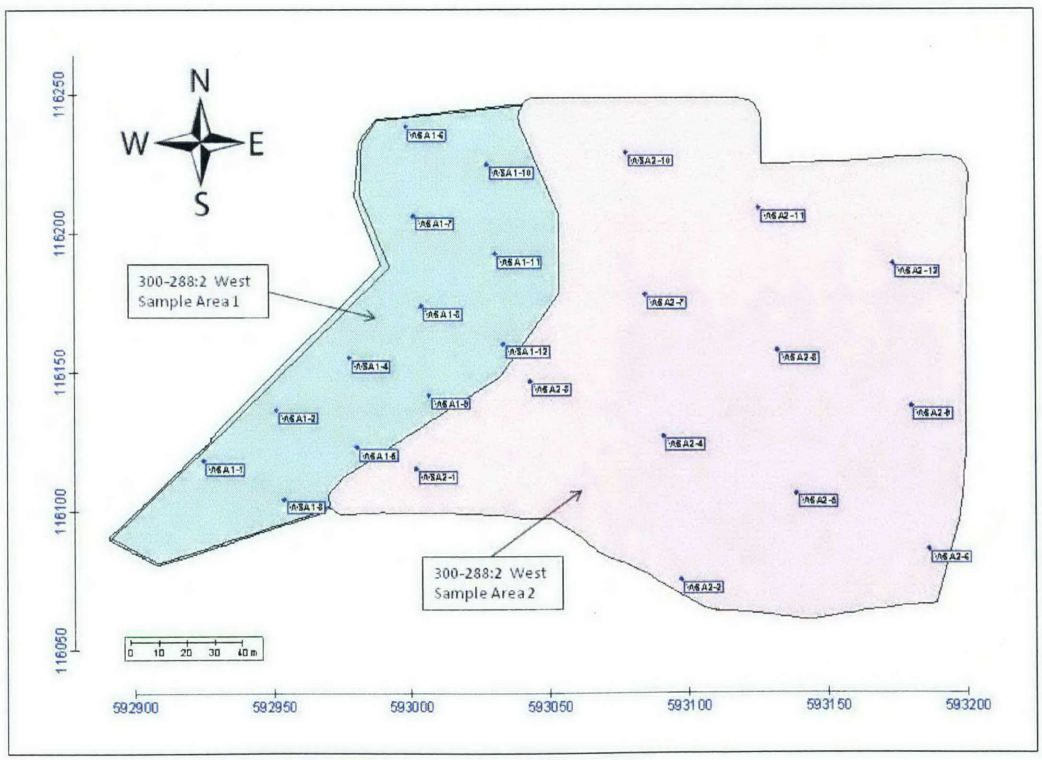


Figure 12. The 300-288:2 West Verification Sample Location Map.



The 95% UCLs were calculated for the 300-288:2 subsite as specified by the 300-F-2 RDR/RAWP (DOE-RL 2016), with calculations provided in Appendix A. When a nonradionuclide COC was detected in fewer than 50% of the verification samples collected, the maximum detected value was used for comparison against the CULs. If no detections for a given COC were reported in the data set, then no statistical evaluation or calculations were performed for that COC.

Comparisons of the statistical results for each COC from the 300-288:2 East sample areas against the CULs are summarized in Tables 4 and 5, and a comparison of the maximum sampling results for each COC from the focused samples from ESA1 are summarized in Table 6. Comparisons of the results for each COC from the 300-288:2 West sample areas against the CULs are summarized in Tables 7 and 8. Contaminants that were not detected by laboratory analysis are excluded from the tables. Calculated CULs for calcium, magnesium, potassium, silicon, and sodium are not presented in the 300-FF-2 RDR/RAWP (DOE-RL 2016). Parameters to calculate cleanup levels for these constituents are not presented in the Cleanup Levels and Risk Calculations Database (Ecology 2016) under WAC 173-340-740(3), "Model Toxics Control Act – Cleanup," or other reference databases. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs and are not included in the table.

Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 may be detected in waste site samples, but are excluded from evaluation in these tables because these isotopes are not related to the operational history of the Hanford Site. The thorium and radium detected in environmental samples are associated with background quantities of uranium naturally present in the soil.

The 300 Area COCs and CULs are provided in the 300 Area ROD (EPA 2013). If a contaminant is discovered during remediation for which a CUL is not established in the ROD, the information will be presented to the U.S. Department of Energy and EPA project managers for determination of a path forward.

While not identified as a 300 Area COC, boron and molybdenum were detected in the verification samples; however, the detections were below the background value. Acenaphthene, benzo(ghi)perylene, fluoranthene, phenanthrene, pyrene, and bis(2-ethylhexyl)phthalate were also detected and are not identified as 300 Area COCs; however, these detections are below risk-based cleanup levels calculated during development of the 300 Area ROD. Therefore, boron, molybdenum, acenaphthene, benzo(ghi)perylene, fluoranthene, phenanthrene, pyrene, and bis(2-ethylhexyl)phthalate concentrations do not require further discussion.

Table 4. Comparison of Contaminant Concentrations to Residential Cleanup Levels for 300-288:2 East Sample Area 1.

COC	Statistical Result [a, b] (pCi/g)	Radionuclide Direct Exposure CULs [c] (pCi/g)	Radionuclide Groundwater and River Protection CULs [c] (pCi/g)	Does the Result Exceed CULs?
Uranium-234 (AEA)	0.234 (<BG)	27.2	--	No
Uranium-238 (GEA)	0.380 (<BG)	26.2	--	No
Uranium-238 (AEA)	0.254 (<BG)	26.2	--	No
COC	**Statistical Result [a, b] (mg/kg)**	**Nonradionuclide Direct Exposure CULs [c] (mg/kg)**	**Nonradionuclide Groundwater and River Protection CULs [c] (mg/kg)**	**Does the Result Exceed CULs?**
Arsenic	0.88 (<BG)	20	20	No
Barium	38.6 (<BG)	16,000	--	No
Beryllium	0.12 (<BG)	160	--	No
Cadmium	0.076 (<BG)	80	176	No
Chromium (total)	4.0 (<BG)	120,000	--	No
Cobalt	5.2 (<BG)	24	--	No
Copper	8.6 (<BG)	3,200	3,400	No
Lead	1.4 (<BG)	250	1,480	No
Lithium	2.8 (<BG)	160	--	No
Manganese	199 (<BG)	11,200	--	No
Mercury	0.014	24	8.5	No
Nickel	7.0 (<BG)	1,600	--	No
Strontium	14.0	48,000	--	No
Uranium	0.37 (<BG)	81	102	No
Vanadium	49.1 (<BG)	400	--	No
Zinc	29.3 (<BG)	24,000	64,100	No
TPH – diesel range	1.0	2,000	2,000	No
TPH – diesel range, ext.	1.8	2,000	2,000	No

[a] Statistical value from verification sample results (Appendix A).
[b] Background values from DOE-RL 1996, DOE-RL 2001, and DOE-RL 2016.
[c] CULs obtained from 300 Area ROD (EPA 2013).

-- = not applicable
AEA = alpha energy analysis
BG = background
COC = contaminant of concern
CUL = cleanup level
GEA = gamma energy analysis
ROD = record of decision
TPH = total petroleum hydrocarbons

Table 5. Comparison of Contaminant Concentrations to Residential Cleanup Levels for 300-288:2 East Sample Area 2.

COC	Statistical Result [a, b] (pCi/g)	Radionuclide Direct Exposure CULs [c] (pCi/g)	Radionuclide Groundwater and River Protection CULs [c] (pCi/g)	Does the Result Exceed CULs?
Uranium-234 (AEA)	0.356 (<BG)	27.2	--	No
Uranium-238 (GEA)	0.484 (<BG)	26.2	--	No
Uranium-238 (AEA)	0.416 (<BG)	26.2	--	No
COC	**Statistical Result [a, b] (mg/kg)**	**Nonradionuclide Direct Exposure CULs [c] (mg/kg)**	**Nonradionuclide Groundwater and River Protection CULs [c] (mg/kg)**	**Does the Result Exceed CULs?**
Arsenic	1.3 (<BG)	20	20	No
Barium	64.2 (<BG)	16,000	--	No
Beryllium	0.19 (<BG)	160	--	No
Cadmium	0.12 (<BG)	80	176	No
Chromium (total)	6.7 (<BG)	120,000	--	No
Cobalt	7.8 (<BG)	24	--	No
Copper	13.9 (<BG)	3,200	3,400	No
Lead	2.4 (<BG)	250	1,480	No
Lithium	4.4 (<BG)	160	--	No
Manganese	303 (<BG)	11,200	--	No
Mercury	0.024	24	8.5	No
Nickel	10.3 (<BG)	1,600	--	No
Strontium	21.8	48,000	--	No
Uranium	0.45 (<BG)	81	102	No
Vanadium	72.0 (<BG)	400	--	No
Zinc	41.8 (<BG)	24,000	64,100	No
TPH – diesel range	1.6	2,000	2,000	No
TPH – diesel range, ext.	2.3	2,000	2,000	No
Aroclor-1254	0.013	0.5	--	No

[a] Statistical or maximum value from verification sample results (Appendix A).
[b] Background values from DOE-RL 1996, DOE-RL 2001, and DOE-RL 2016.
[c] CULs obtained from 300 Area ROD (EPA 2013).

-- = not applicable
AEA = alpha energy analysis
BG = background
COC = contaminant of concern
CUL = cleanup level
GEA = gamma energy analysis
ROD = record of decision
TPH = total petroleum hydrocarbons

Table 6. Comparison of Contaminant Concentrations to Residential Cleanup Levels for 300-288:2 East Sample Area 1 Focused Locations.

COC	Maximum Result [a, b] (pCi/g)	Radionuclide Direct Exposure CULs [c] (pCi/g)	Radionuclide Groundwater and River Protection CULs [c] (pCi/g)	Does the Result Exceed CULs?
Uranium-234 (AEA)	0.478 (<BG)	27.2	--	No
Uranium-238 (GEA)	0.450 (<BG)	26.2	--	No
Uranium-238 (AEA)	0.495 (<BG)	26.2	--	No
COC	**Maximum Result [a, b] (mg/kg)**	**Nonradionuclide Direct Exposure CULs [c] (mg/kg)**	**Nonradionuclide Groundwater and River Protection CULs [c] (mg/kg)**	**Does the Result Exceed CULs?**
Arsenic	1.2 (<BG)	20	20	No
Barium	53.8 (<BG)	16,000	--	No
Beryllium	0.17 (<BG)	160	--	No
Cadmium	0.11 (<BG)	80	176	No
Chromium (total)	5.6 (<BG)	120,000	--	No
Cobalt	6.5 (<BG)	24	--	No
Copper	11.1 (<BG)	3,200	3,400	No
Lead	1.8 (<BG)	250	1,480	No
Lithium	3.5 (<BG)	160	--	No
Manganese	260 (<BG)	11,200	--	No
Mercury	0.012 (<BG)	24	8.5	No
Nickel	7.9 (<BG)	1,600	--	No
Strontium	20.0	48,000	--	No
Uranium	0.34 (<BG)	81	102	No
Vanadium	62.9 (<BG)	400	--	No
Zinc	37.5 (<BG)	24,000	64,100	No
TPH – diesel range	2.0	2,000	2,000	No
TPH – diesel range, ext.	2.3	2,000	2,000	No
Aroclor-1248	0.044	0.5	0.13	No
Aroclor-1260	0.0036	0.5	--	No

[a] Maximum value from focused verification sample results (Appendix A).
[b] Background values from DOE-RL 1996, DOE-RL 2001, and DOE-RL 2016.
[c] CULs obtained from 300 Area ROD (EPA 2013).

-- = not applicable
AEA = alpha energy analysis
BG = background
COC = contaminant of concern
CUL = cleanup level
GEA = gamma energy analysis
ROD = record of decision
TPH = total petroleum hydrocarbons

Table 7. Comparison of Contaminant Concentrations to Residential Cleanup Levels for 300-288:2 West Sample Area 1.

COC	Statistical Result [a, b] (pCi/g)	Radionuclide Direct Exposure CULs [c] (pCi/g)	Radionuclide Groundwater and River Protection CULs [c] (pCi/g)	Does the Result Exceed CULs?
Uranium-234 (AEA)	0.288 (<BG)	27.2	--	No
Uranium-238 (GEA)	0.723 (<BG)	26.2	--	No
Uranium-238 (AEA)	0.307 (<BG)	26.2	--	No
COC	**Statistical Result [a, b] (mg/kg)**	**Nonradionuclide Direct Exposure CULs [c] (mg/kg)**	**Nonradionuclide Groundwater and River Protection CULs [c] (mg/kg)**	**Does the Result Exceed CULs?**
Antimony	0.38	32	252	No
Arsenic	3.6 (<BG)	20	20	No
Barium	75.5 (<BG)	16,000	--	No
Beryllium	0.17 (<BG)	160	--	No
Cadmium	0.13 (<BG)	80	176	No
Chromium (total)	10.1 (<BG)	120,000	--	No
Cobalt	9.2 (<BG)	24	--	No
Copper	13.3 (<BG)	3,200	3,400	No
Lead	7.3 (<BG)	250	1,480	No
Lithium	7.7 (<BG)	160	--	No
Manganese	366 (<BG)	11,200	--	No
Mercury	0.011 (<BG)	24	8.5	No
Nickel	9.8 (<BG)	1,600	--	No
Selenium	0.89	400	302	No
Strontium	20.7	48,000	--	No
Uranium	0.55 (<BG)	81	102	No
Vanadium	58.7 (<BG)	400	--	No
Zinc	48.2 (<BG)	24,000	64,100	No
TPH – diesel range	17	2,000	2,000	No
TPH – diesel range, ext.	5.4	2,000	2,000	No
Aroclor-1260	0.058	0.5	--	No
Benzo(a)pyrene TEC [d]	0.098	0.14	--	No
Chrysene	0.070	14	--	No

[a] Statistical value from verification sample results (Appendix A).
[b] Background values from DOE-RL 1996, DOE-RL 2001, and DOE-RL 2016.
[c] CULs obtained from 300 Area ROD (EPA 2013).
[d] Evaluation of the compliance of benzo(a)pyrene with the CULs includes the toxic equivalent concentrations of other detected carcinogenic PAH (DOE-RL 2016). This includes the COC chrysene.

-- = not applicable
AEA = alpha energy analysis
BG = background
COC = contaminant of concern
CUL = cleanup level
GEA = gamma energy analysis
PAH = polycyclic aromatic hydrocarbon
ROD = record of decision
TEC = toxic equivalent concentration
TPH = total petroleum hydrocarbons

Table 8. Comparison of Contaminant Concentrations to Residential Cleanup Levels for 300-288:2 West Sample Area 2.

COC	Statistical Result [a, b] (pCi/g)	Radionuclide Direct Exposure CULs [c] (pCi/g)	Radionuclide Groundwater and River Protection CULs [c] (pCi/g)	Does the Result Exceed CULs?
Uranium-234 (AEA)	0.385 (<BG)	27.2	--	No
Uranium-238 (GEA)	0.477 (<BG)	26.2	--	No
Uranium-238 (AEA)	0.375 (<BG)	26.2	--	No
COC	**Statistical Result [a, b] (mg/kg)**	**Nonradionuclide Direct Exposure CULs [c] (mg/kg)**	**Nonradionuclide Groundwater and River Protection CULs [c] (mg/kg)**	**Does the Result Exceed CULs?**
Antimony	0.55	32	252	No
Arsenic	5.9 (<BG)	20	20	No
Barium	71.1 (<BG)	16,000	--	No
Beryllium	0.20 (<BG)	160	--	No
Cadmium	0.19 (<BG)	80	176	No
Chromium (total)	6.9 (<BG)	120,000	--	No
Cobalt	7.2 (<BG)	24	--	No
Copper	13.7 (<BG)	3,200	3,400	No
Lead	3.7 (<BG)	250	1,480	No
Lithium	5.9 (<BG)	160	--	No
Manganese	274 (<BG)	11,200	--	No
Mercury	0.023	24	8.5	No
Nickel	8.8 (<BG)	1,600	--	No
Strontium	27.3	48,000	--	No
Uranium	0.50 (<BG)	81	102	No
Vanadium	63.5 (<BG)	400	--	No
Zinc	43.9 (<BG)	24,000	64,100	No
TPH – diesel range	11	2,000	2,000	No
TPH – diesel range, ext.	31	2,000	2,000	No
Aroclor-1254	0.0044	0.5	--	No
Aroclor-1260	0.051	0.5	--	No

[a] Statistical value from verification sample results (Appendix A).
[b] Background values from DOE-RL 1996, DOE-RL 2001, and DOE-RL 2016.
[c] CULs obtained from 300 Area ROD (EPA 2013).

-- = not applicable
AEA = alpha energy analysis
BG = background
COC = contaminant of concern
CUL = cleanup level
GEA = gamma energy analysis
ROD = record of decision
TPH = total petroleum hydrocarbons

6.2 FOCUSED SAMPLE RESULTS

Statistical analysis (e.g., calculation of a 95% UCL value) is inappropriate to use for evaluation of focused samples; therefore, the sample results are evaluated using the maximum detected activity for each COC and comparing the value directly to the CULs (Table 6).

6.3 DATA QUALITY ASSESSMENT PROCESS

A DQA was performed to compare the 300-288:2 subsite verification sampling approach and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications.

The DQA determined 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 also verified that the sample design was sufficient to support clean site verification. The cleanup verification sample analytical data are stored in a Washington Closure Hanford project-specific database prior to archiving in Hanford Environmental Information System and are presented as an attachment to the *300-288:2 Subsite Cleanup Verification 95% UCL Calculations* (Appendix A). The detailed DQA is presented in Appendix B.

7.0 CLEANUP VERIFICATION DATA EVALUATION

This section describes the evaluation of the sampling data in terms of comparison to the CULs, the radionuclide risk requirements, and the nonradionuclide risk requirements.

7.1 COMPARISON OF SAMPLE DATA TO THE CLEANUP LEVELS

Evaluation of the results listed in Tables 4 through 8 from the verification sampling at the 300-288:2 subsite indicates that all radionuclide and nonradionuclide COCs were quantified below the residential direct exposure, groundwater protection, and river protection CULs. Residential CULs to be protective of groundwater and the river were calculated based on federal drinking water standards as described in Section 8.2 of the 300 Area ROD (EPA 2013).

Per WAC 173-340-708(8) (Ecology 2007), compliance with CULs for a mixture of carcinogenic polycyclic aromatic hydrocarbons (PAH) is determined by considering the mixture as a single hazardous substance and using the CUL established for benzo(a)pyrene as the CUL for the mixture. The statistical or maximum value for each carcinogenic PAH is multiplied by the corresponding toxicity equivalency factor to obtain the toxic equivalent benzo(a)pyrene concentration for that carcinogenic PAH. The toxic

equivalent concentrations of all the carcinogenic PAH are added to obtain the total toxic equivalent concentration of benzo(a)pyrene for the decision unit, and that value is compared against the benzo(a)pyrene CUL.

The benzo(a)pyrene toxic equivalency concentrations for the statistical decision units and the focused samples are calculated in the 95% UCL calculation brief as described in Appendix A.

7.2 EVALUATION OF ATTAINMENT OF RADIONUCLIDE AND NONRADIONUCLIDE RISK REQUIREMENTS

This section discusses how the verification sampling data are used in demonstrating attainment of radionuclide and nonradionuclide risk requirements.

7.2.1 Radionuclide Evaluation of Risk and Dose

The CULs for soil radionuclide COCs in the 300 Area ROD (EPA 2013) were set at a 1×10^{-4} risk limit or 15 mrem/yr dose limit, whichever is more conservative. In addition to meeting these individual CULs, a comparison of the radionuclide verification sample results to the cumulative direct exposure radionuclide excess cancer risk limit of 1×10^{-4} and the radiological dose limit of 15 mrem/yr is considered. Only uranium isotopes were detected for the 300-288:2 subsite, and all statistical values were below background. Therefore, no further calculation of cumulative effects was performed.

7.2.2 Attainment of Nonradionuclide Noncarcinogenic and Carcinogenic Risk Standards

For COCs with noncarcinogenic effects, *Washington Administrative Code* (WAC) 173-340 specified the evaluation of the hazard quotient, which is given as daily intake divided by a reference dose (WAC 173-340-200). The solutions and details of the hazard quotient calculations for 300-288:2 subsite are provided in Appendix A.

Nonradionuclide risk requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6} (for residential), and a cumulative carcinogenic risk of less than 1×10^{-5}. Hazard quotient and excess carcinogenic risk calculations were performed for the 300-288:2 subsite using the maximum of the statistical values from the cleanup verification samples. Risk values were not calculated for constituents that were not detected or were detected at concentrations below Hanford Site or Washington State background values.

For the 300-288:2 subsite, all individual hazard quotients are below 1.0 and the cumulative hazard quotient (2.93×10^{-2}) is less than 1.0. All individual excess carcinogenic risk values are below 1×10^{-6} and the cumulative excess cancer risk (9.48×10^{-7}) is less than 1×10^{-5}.

8.0 STATEMENT OF PROTECTIVENESS

This cleanup verification package demonstrates that remedial action at the 300-288:2 subsite has achieved the RAOs and corresponding CULs established for the residential land-use scenario in the 300 Area ROD (EPA 2013) and meets the requirements of the 300-FF-2 RDR/RAWP (DOE-RL 2016). The contaminated materials from the site have been excavated and disposed at ERDF. The remaining soil at the 300-288:2 subsite has been sampled, analyzed, and evaluated, and the results indicate that the site supports future land uses that can be represented (or bounded) by the residential land-use scenario and poses no threat to groundwater or the Columbia River. The waste site was remediated to achieve CULs for residential land use; therefore, institutional controls are not required. The 300-288:2 subsite is verified to be remediated in accordance with the 300 Area ROD and has been reclassified to a status of Final Closed Out. Because the 300-288:2 subsite is located within a borrow pit (Hanford Borrow Pit 6), the subsite will not require backfill as it will continue to be used for borrow material (EPA 2016).

9.0 REFERENCES

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WCH, 2015b, *Characterization Report for the 300-288:2 Waste Site*, WCH-614, Rev. 0, Washington Closure Hanford, Richland, Washington.

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WCH, 2016, *Work Instruction for Verification Sampling of the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 Subsite,* 0300X-WI-G0060, Rev. 1, Washington Closure Hanford, Richland, Washington.

APPENDIX A

CALCULATIONS

APPENDIX A

CALCULATIONS

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

300-288:2 Subsite Cleanup Verification 95% UCL Calculations, 0300X-CA-V0244, Rev. 0, Washington Closure Hanford, Richland, Washington A-3

300-288:2 Subsite Direct Contact Hazard Quotient and Carcinogenic Risk Calculations, 0300X-CA-V0245, Rev. 0, Washington Closure Hanford, Richland, Washington.....A-65

DISCLAIMER FOR CALCULATIONS

The calculations provided in this appendix have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents.

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 300 Area Closure Operations **Job No. 14655**

Area: 300

Discipline: Environmental *Calculation No: 0300X-CA-V0244

Subject: 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Computer Program: Excel Program No: Excel 2010

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

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 25 Attm. 1 = 34 Total = 60	R. J. Nielson	J. M. Capron	B. L. Vedder	S. G. Wilkinson	8/4/16

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	R. J. Nielson	**Calc. No.**	0300X-CA-V0244	**Rev. No.**	0
Project	300 Area Closure Operations	**Checked**	J. M. Capron	**Date**	07/27/16
Subject	300-288:2 Subsite Cleanup Verification 95% UCL Calculations	**Job No.**	14655	**Sheet No.**	1 of 25

Summary

Purpose:
Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the 300-288:2 subsite included in the *Hanford Site 300 Area, Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1, Hanford Site, Benton County, Washington* (300 Area ROD) (EPA 2013a). ProUCL 5.0 (EPA 2013b) software was used for all calculations. Also, calculate the relative percent difference (RPD) for primary-duplicate/split sample pairs for each contaminant of concern (COC), as necessary.

Table of Contents:
Sheets 1 to 4 - Calculation Sheet Summary
Sheets 5 to 16 - Calculation Sheet Verification Data - 300-288:2 subsite (all decision units)
Sheets 17 to 24 - Calculation Sheet - Duplicate and Split Analysis - 300-288:2 subsite (all decision units)
Sheet 25 - Calculation Sheet - Benzo(a)pyrene Toxic Equivalent Concentration Calculation
Attachment 1 - 300-288:2 Subsite Verification Sampling Results (34 sheets)

Given/References:
1) Sample Results (Attachment 1).
2) DOE-RL, 2014, *300 Area Remedial Action Sampling and Analysis Plan*, DOE/RL-2001-48, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
3) DOE-RL, 2016, *Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils*, DOE/RL-2014-13-ADD1, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) Ecology, 2011, *Cleanup Levels and Risk Calculations (CLARC) Database*, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
5) EPA, 1989, *Risk Assessment Guidance for Superfund: Volume 1*, Human Health Evaluation Manual, Part A; Interim Final, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D.C.
6) 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.
7) EPA, 2013a, *Hanford Site 300 Area, Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1, Hanford Site, Benton County, Washington*, November 2013, U. S. Environmental Protection Agency, Region 10, Seattle Washington.
8) EPA, 2013b, ProUCL, Version 5.0, U.S. Environmental Protection Agency, Washington, D.C. <http://www.epa.gov/osp/hstl/tsc/software.htm>.
9) WCH, 2016, *300-288:2 Subsite General UCL Statistics, ProUCL Calculation Details*, CCN 183371, Washington Closure Hanford, Richland, Washington.

Solution:
Calculations were performed using ProUCL 5.0 (EPA 2013b) software with the data presented on each calculation worksheet. The hazard quotient and carcinogenic risk calculations are located in a separate calculation brief as an appendix to the Cleanup Verification Package (CVP).

Calculation Description:
The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 300-288:2 subsite. The data were entered into an EXCEL 2010 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 *Remedial Design Report/Remedial Action Work Plan for the 300-FF-2 Soils* (300-FF-2 RDR/RAWP) (DOE-RL 2016) is documented by this calculation. Duplicate/Split relative percent difference (RPD) results are used in evaluation of data quality within the CVP for this site.

Methodology:
The 300-288:2 subsite underwent statistical sampling at the east and west excavation decision units. Each decision unit was further divided into two sample areas. Twelve statistical soil samples plus one duplicate and one split sample were collected from each sample area, and four focused soil samples were collected from the east excavation decision unit, sample area 1. Additionally, one equipment blank sample was collected from each decision unit. Analytical data for all sampling locations are provided in the summary tables on sheet 4.

The primary statistical calculation to support cleanup verification is the 95% UCL on the arithmetic mean of the data. In accordance with the 300-FF-2 RDR/RAWP (DOE-RL 2016), the 95% UCL values for detected COCs in statistical data sets are calculated for each decision unit according to the following:

If there are 5 or more detections of a given COC, and the COC is detected in 25% or more of the total samples, a UCL is calculated. A detection in either or both of the primary/duplicate sample pair is considered a single detection. If there are less than 5 detections of a given COC within a data set, a UCL is not calculated and the maximum concentration is used. Direct comparison of the maximum value against site cleanup levels (CULs) is used as the compliance basis. For convenience, these maximum detected values are included in the summary tables that follow.

Summary (continued)

Methodology (continued):

If a given COC is detected in 5 or more samples, but is detected in 25% or less of the total samples, a UCL is not calculated and the maximum concentration is used. A detection in either or both of the primary/duplicate sample pair is considered a single detection. If there are no detections of a COC, then there is no calculation or further evaluation performed for the COC.

For the statistical evaluation of primary/duplicate sample pairs, the following is applied to determine the value to be used in the UCL calculation:

- If detections are reported for both the primary and duplicate, the maximum concentration is used.
- If one detection and one nondetection are reported, the detected concentration is used.
- If both the primary and duplicate are reported as nondetects, the higher detection limit is used.

For sample results that are non-detects (e.g., "U" or "UJ" flagged), the full reported minimum detectable activity (radionuclides) or practical quantitation limit (nonradionuclides) value is used as the concentration. Data are then identified as detected (1) or non-detected (0) in the ProUCL data input file. The 95% UCL is computed by ProUCL using the identified detection status and all available data distributions. In cases that ProUCL output identifies more than one potential UCL for a given data set, the UCL with the highest value is chosen.

For focused sampling, no statistical evaluation is performed and the maximum detected value is used for comparison with the CULs. For convenience, these maximum detected values are included with the 95% UCL results in the summary tables that follow.

Calculated cleanup levels are not available in Ecology (2011) for calcium, magnesium, potassium, silicon, and sodium. The EPA's Risk Assessment Guidance for Superfund (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs and are also not included in these calculations.

ProUCL output from UCL analysis is presented in the *300-288:2 Subsite General UCL Statistics, ProUCL Calculation Details* (WCH 2016). In addition to identifying the 95% UCL for each data set, the ProUCL output includes additional statistical information. ProUCL analysis may result in a potential UCL with a confidence limit greater than 95% (e.g., 97.5%, 99%). In such cases, the identified potential UCL is used and reported with the associated confidence limit. In cases that ProUCL output recommends more than one potential UCL for a given data set, the UCL with the highest value is chosen. Arrangement of the ProUCL data output into formatted tables was performed to optimize data presentation (Attachment 1).

The RPD is calculated when both the primary value and the duplicate/split value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed in Table II-1 of the SAP (DOE-RL 2014) for certain constituents with cleanup levels or shown in laboratory-specific documents; all other constituents will have their own pre-determined TDL's based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate/split sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

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

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

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. For QA/QC split RPD calculations, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for 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 exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed.

Washington Closure Hanford **CALCULATION SHEET**

Originator	R. J. Nielson	**Calc. No.**	0300X-CA-V0244	**Rev. No.**	0
Project	300 Area Closure Operations	**Checked**	J. M. Capron	**Date**	07/27/16
Subject	300-288:2 Subsite Cleanup Verification 95% UCL Calculations	**Job No.**	14655	**Sheet No.**	3 of 25

Summary (continued)

Qualifiers

* = Duplicate analysis not within control limits.
B = Estimated result. Result is less than the RL, but greater than the MDL.
C = Target analyte was detected in both the sample and the associated QC blank and the concentration was </= 5x the blank concentration.
D = Results are reported from a diluted aliquot of sample.
J = The result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M = Sample duplicate precision not met.
N = Recovery exceeds upper or lower control limits.
U = Analyzed for but not detected.
X = Serial dilution in the analytical batch indicates that physical and chemical interferences are present.

Acronyms

COC = contaminant of concern
CUL = cleanup level
CVP = cleanup verification package
ESA = east samle area
MDA = minimum detectable activity
MDL = method detection limit
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
RDR/RAWP = remedial design report/remedial action work plan
RPD = relative percent difference
SAP = sampling and analysis plan
TDL = target detection limit
UCL = upper confidence limit
WSA = west sample area

Washington Closure Hanford **CALCULATION SHEET**

Originator R. J. Nielson		**Calc. No.** 0300X-CA-V0244	**Rev. No.** 0
Project 300 Area Closure Operations		**Checked** J. M. Capron	**Date** 07/27/16
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations		**Job No.** 14655	**Sheet No.** 4 of 25

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the results of the maximum and 95% UCL calculations for the 300-288:2 subsite statistical and focused samples, and the RPD calculations, and are for use in risk analysis and the CVP for this waste site.

Results Summary

Analyte	300-288:2 East, Sample Area 1		300-288:2 East, Sample Area 2		300-288:2 West Sample Area 1		300-288:2 West Sample Area 2		Focused Samples	Units
	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	95% UCL Result	Maximum Result	Maximum Result	
Uranium-234 (AEA)	0.234	--	0.356	--	0.288	--	0.385	--	0.478	pCi/g
Uranium-238 (GEA)	0.380	--	0.484	--	0.723	--	0.477	--	0.450	pCi/g
Uranium-238 (AEA)	0.254	--	0.416	--	0.307	--	0.375	--	0.495	pCi/g
Antimony	--	--	--	--	0.38	--	0.55	--	--	mg/kg
Arsenic	0.88	--	1.3	--	3.6	--	5.9	--	1.2	mg/kg
Barium	38.6	--	64.2	--	75.5	--	71.1	--	53.8	mg/kg
Beryllium	0.12	--	0.19	--	0.17	--	0.20	--	0.17	mg/kg
Boron	--		--	--	--	1.4	2.1	--	--	mg/kg
Cadmium	0.076	--	0.12	--	0.13	--	0.19	--	0.11	mg/kg
Chromium	4.0	--	6.7	--	10.1	--	6.9	--	5.6	mg/kg
Cobalt	5.2	--	7.8	--	9.2	--	7.2	--	6.5	mg/kg
Copper	8.6	--	13.9	--	13.3	--	13.7	--	11.1	mg/kg
Lead	1.4	--	2.4	--	7.3	--	3.7	--	1.8	mg/kg
Lithium	2.8	--	4.4	--	7.7	--	5.9	--	3.5	mg/kg
Manganese	199	--	303	--	366	--	274	--	260	mg/kg
Mercury	0.014	--	0.024	--	0.011	--	--	0.023	0.012	mg/kg
Molybdenum	--	0.20	0.37	--	--	--	0.35	--	--	mg/kg
Nickel	7.0	--	10.3	--	9.8	--	8.8	--	7.9	mg/kg
Selenium	--	--	--	--	--	0.89	--	--	--	mg/kg
Strontium	14.0	--	21.8	--	20.7	--	27.3	--	20.0	mg/kg
Uranium	0.37	--	0.45	--	0.55	--	0.50	--	0.34	mg/kg
Vanadium	49.1	--	72.0	--	58.7	--	63.5	--	62.9	mg/kg
Zinc	29.3	--	41.8	--	48.2	--	43.9	--	37.5	mg/kg
TPH - diesel extended	--	1800	--	2300	17000	--	31000	--	2300	ug/kg
TPH - diesel range	1000	--	--	1600	5400	--	11000	--	2000	ug/kg
Aroclor-1248	--	--	--	--	--	--	--	--	44	ug/kg
Aroclor-1254	--	--	--	13	--	--	--	4.4	--	ug/kg
Aroclor-1260	--	--	--	--	--	58	--	51	3.6	ug/kg
Acenaphthene	--	12	--	--	--	--	--	--	--	ug/kg
Benzo(a)anthracene	--	--	--	--	--	72	--	--	--	ug/kg
Benzo(a)pyrene	--	--	--	--	--	49	--	--	--	ug/kg
Benzo(b)fluoranthene	--	--	--	--	--	76	--	--	--	ug/kg
Benzo(ghi)perylene	--	--	--	--	--	260	--	--	--	ug/kg
Chrysene	--	--	--	--	--	70	--	--	--	ug/kg
Dibenz(a,h)anthracene	--	--	--	--	--	150	--	--	--	ug/kg
Fluoranthene	--	--	--	--	--	100	--	--	--	ug/kg
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	180	--	--	--	ug/kg
Phenanthrene	--	17	--	--	--	74	--	--	--	ug/kg
Pyrene	--	15	--	--	--	120	--	13	--	ug/kg
Bis(2-ethylhexyl)phthalate	--	92	--	150	--	--	--	--	--	ug/kg
BaP TEC	--		--		0.098		--		--	mg/kg

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

Analyte	300-288:2 East, Sample Area 1		300-288:2 East, Sample Area 2		300-288:2 West Sample Area 1		300-288:2 West Sample Area 2	
	Duplicate	Split	Duplicate	Split	Duplicate	Split	Duplicate	Split
Potassium-40	7.0%	19.7%	3.0%	***38.5%***	0.7%	4.9%	12.4%	0.3%
Radium-228	--	--	--	7.4%	1.2%	1.4%	12.8%	5.7%
Aluminum	***61.4***	***50.2%***	***32.6%***	1.0%	1.0%	27.4%	5.3%	19.5%
Barium	***66.8%***	***66.7%***	26.9%	14.5%	0.4%	4.3%	7.8%	4.8%
Calcium	***65.1%***	***64.6%***	26.4%	18.1%	12.9%	20.3%	6.4%	2.2%
Chromium	--	--	--	--	10.3%	17.8%	10.2%	9.4%
Copper	***74.2%***	***79.6%***	***34.5%***	***36.8%***	3.1%	4.4%	14.6%	16.0%
Iron	***63.4%***	***75.4%***	24.1%	29.5%	1.3%	7.4%	13.4%	2.2%
Magnesium	***60.3%***	***68.1%***	***31.4%***	21.9%	5.5%	5.0%	14.1%	8.0%
Manganese	***64.4%***	***67.9%***	27.9%	26.4%	2.3%	2.6%	13.7%	15.2%
Silicon	12.7%	***49.2%***	***41.7%***	***106.7%***	7.0%	4.9%	22.0%	***45.1%***
Sodium	***61.8%***	***60.9%***	--	--	--	--	1.8%	--
Strontium	--	--	***31.4%***	14.5%	1.4%	19.6%	7.8%	10.8%
Vanadium	***64.6%***	***86.7%***	27.7%	34.4%	0.2%	6.2%	12.6%	25.2%
Zinc	***60.8%***	***85.1%***	23.9%	***37.8%***	0.2%	6.5%	11.4%	1.0%
Zirconium	--	--	27.0%	23.1%	0.9%	28.2%	8.2%	8.7%

[a]RPD listed where result produced, based on criteria. If RPD not required, no value is listed. The significance of the reported RPD values, including values greater than 30% (or 35% for split data), is addressed in the data quality assessment section of the CVP.

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron
Job No. 14655

Rev. No. 0
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300-288:2 Waste Site Statistical Calculations
Verification Data - East Sample Area 1

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Arsenic			Barium			Beryllium			Cadmium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	0.124		0.0572	0.353		0.224	0.344		0.0528	0.58	U	0.58	27.2	X	0.067	0.097	B	0.029	0.061	B	0.036
Duplicate of J1V8F8	J1V8H4	3/2/16	0.275		0.0549	0.311		0.200	0.162		0.0549	1.1		0.65	54.5	X	0.075	0.18	B	0.033	0.10	B	0.041
ESA1-1	J1V8F2	3/2/16	0.0313	U	0.0530	0.344		0.217	0.0595	U	0.0659	0.56	BN	0.48	32.8	XMN	0.055	0.11	BMN	0.024	0.056	B	0.030
ESA1-2	J1V8F3	3/2/16	0.0986		0.0479	0.421		0.263	0.127		0.0479	0.75	B	0.63	37.0	X	0.072	0.11	B	0.031	0.072	B	0.039
ESA1-3	J1V8F4	3/2/16	0.182		0.0610	0.266	U	0.904	0.299		0.0610	1.0		0.67	24.5	X	0.077	0.086	B	0.033	0.048	B	0.042
ESA1-4	J1V8F5	3/2/16	0.217		0.0605	0.326	U	1.07	0.140		0.0528	0.72	B	0.63	19.5	X	0.073	0.070	B	0.032	0.062	B	0.039
ESA1-5	J1V8F6	3/2/16	0.282		0.0610	0.302		0.226	0.165		0.0645	1.1		0.64	38.6	X	0.073	0.14	B	0.032	0.089	B	0.040
ESA1-6	J1V8F7	3/2/16	0.305		0.0589	0.346		0.204	0.264		0.0567	0.79	B	0.57	44.3	X	0.065	0.13	B	0.028	0.084	B	0.035
ESA1-8	J1V8F9	3/2/16	0.175		0.0653	0.346		0.270	0.0947		0.0624	0.58	U	0.58	27.4	X	0.066	0.071	B	0.029	0.054	B	0.036
ESA1-9	J1V8H0	3/2/16	0.208		0.0589	0.622	U	0.980	0.129		0.0545	0.93		0.55	31.8	X	0.063	0.11	B	0.027	0.067	B	0.034
ESA1-10	J1V8H1	3/2/16	0.154		0.0663	0.576	U	1.07	0.282		0.0576	0.50	U	0.50	30.5	X	0.057	0.10	B	0.025	0.060	B	0.031
ESA1-11	J1V8H2	3/2/16	0.144		0.0659	0.968	U	0.971	0.161		0.0574	0.66	B	0.61	37.8	X	0.071	0.10	B	0.031	0.071	B	0.038
ESA1-12	J1V8H3	3/2/16	0.238		0.0649	0.359	U	1.06	0.352		0.0542	0.47	U	0.47	24.4	X	0.054	0.093	B	0.024	0.046	B	0.029

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Arsenic			Barium			Beryllium			Cadmium		
			pCi/g	DS		pCi/g	DS		pCi/g	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
ESA1-7	J1V8F8/ J1V8H4	3/2/16	0.275	1		0.353	1		0.344	1		1.1	1		54.5	1		0.18	1		0.10	1	
ESA1-1	J1V8F2	3/2/16	0.0530	0		0.344	1		0.0659	0		0.56	1		32.8	1		0.11	1		0.056	1	
ESA1-2	J1V8F3	3/2/16	0.0986	1		0.421	1		0.127	1		0.75	1		37.0	1		0.11	1		0.072	1	
ESA1-3	J1V8F4	3/2/16	0.182	1		0.904	0		0.299	1		1.0	1		24.5	1		0.086	1		0.048	1	
ESA1-4	J1V8F5	3/2/16	0.217	1		1.07	0		0.140	1		0.72	1		19.5	1		0.070	1		0.062	1	
ESA1-5	J1V8F6	3/2/16	0.282	1		0.302	1		0.165	1		1.1	1		38.6	1		0.14	1		0.089	1	
ESA1-6	J1V8F7	3/2/16	0.305	1		0.346	1		0.264	1		0.79	1		44.3	1		0.13	1		0.084	1	
ESA1-8	J1V8F9	3/2/16	0.175	1		0.346	1		0.0947	1		0.58	0		27.4	1		0.071	1		0.054	1	
ESA1-9	J1V8H0	3/2/16	0.208	1		0.980	0		0.129	1		0.93	1		31.8	1		0.11	1		0.067	1	
ESA1-10	J1V8H1	3/2/16	0.154	1		1.07	0		0.282	1		0.50	0		30.5	1		0.10	1		0.060	1	
ESA1-11	J1V8H2	3/2/16	0.144	1		0.971	0		0.161	1		0.66	1		37.8	1		0.10	1		0.071	1	
ESA1-12	J1V8H3	3/2/16	0.238	1		1.06	0		0.352	1		0.47	0		24.4	1		0.093	1		0.046	1	

Statistical Computations

	Uranium-234 (AEA)	Uranium-238 (GEA)	Uranium-238 (AEA)	Arsenic	Barium	Beryllium	Cadmium
95% UCL based on	95% KM (t) UCL	95% KM (t) UCL	95% KM (t) UCL	95% KM (t) UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12	12
% < Detection limit	8%	50%	8%	25%	0%	0%	0%
Mean	0.194	0.681	0.202	0.76	33.6	0.11	0.067
Standard deviation	0.0641	0.0385	0.0949	0.20	9.6	0.031	0.017
95% UCL on mean	0.234	0.380	0.254	0.88	38.6	0.12	0.076
Maximum value	0.305	1.07	0.352	1.1	54.5	0.18	0.10

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
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Rev. No. 0
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300-288:2 Waste Site Statistical Calculations

Verification Data - East Sample Area 1

Sample Area	Sample Number	Sample Date	Chromium			Cobalt			Copper			Lead			Lithium			Manganese			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	3.6	X	0.051	3.6	X	0.088	5.6		0.19	1.0		0.24	2.2		0.80	141	X	0.088	0.011	B	0.0061
Duplicate of J1V8F8	J1V8H4	3/2/16	5.9	X	0.057	7.0	X	0.099	12.2		0.22	2.0		0.27	4.3		0.90	275	X	0.099	0.013	B	0.0060
ESA1-1	J1V8F2	3/2/16	3.1	XN	0.042	4.6	XMN	0.073	7.3		0.16	1.2	N	0.20	2.3	MN	0.66	174	X	0.073	0.021	NM	0.0061
ESA1-2	J1V8F3	3/2/16	4.2	X	0.055	5.8	X	0.095	8.7		0.21	1.2		0.26	2.6		0.86	211	X	0.095	0.015	B	0.0058
ESA1-3	J1V8F4	3/2/16	2.3	X	0.059	3.8	X	0.10	6.0		0.22	0.99		0.27	2.0	B	0.92	133	X	0.10	0.015	B	0.0058
ESA1-4	J1V8F5	3/2/16	2.9	X	0.056	3.4	X	0.096	5.6		0.21	1.1		0.26	2.0	B	0.87	126	X	0.096	0.016	B	0.0059
ESA1-5	J1V8F6	3/2/16	3.9	X	0.056	5.7	X	0.097	9.5		0.21	1.6		0.26	3.1		0.88	220	X	0.097	0.011	B	0.0057
ESA1-6	J1V8F7	3/2/16	4.3	X	0.050	5.5	X	0.086	8.8		0.19	1.5		0.23	3.1		0.78	219	X	0.086	0.011	B	0.0059
ESA1-8	J1V8F9	3/2/16	2.2	X	0.051	3.4	X	0.087	5.1		0.19	1.6		0.24	1.6	B	0.79	126	X	0.087	0.010	B	0.0062
ESA1-9	J1V8H0	3/2/16	3.4	X	0.048	4.4	X	0.083	7.3		0.18	1.1		0.22	2.1		0.76	155	X	0.083	0.0092	B	0.0059
ESA1-10	J1V8H1	3/2/16	3.1	X	0.044	4.0	X	0.075	6.4		0.16	0.94		0.20	1.8	B	0.68	142	X	0.075	0.0098	B	0.0058
ESA1-11	J1V8H2	3/2/16	3.4	X	0.054	4.0	X	0.093	7.0		0.20	1.1		0.25	2.7		0.85	176	X	0.093	0.0095	B	0.0062
ESA1-12	J1V8H3	3/2/16	2.8	X	0.042	4.1	X	0.072	6.6		0.16	0.73		0.19	1.4	B	0.65	121	X	0.072	0.0098	B	0.0068

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Chromium			Cobalt			Copper			Lead			Lithium			Manganese			Mercury		
			mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
ESA1-7	J1V8F8/ J1V8H4	3/2/16	5.9	1		7.0	1		12.2	1		2.0	1		4.3	1		275	1		0.013	1	
ESA1-1	J1V8F2	3/2/16	3.1	1		4.6	1		7.3	1		1.2	1		2.3	1		174	1		0.021	1	
ESA1-2	J1V8F3	3/2/16	4.2	1		5.8	1		8.7	1		1.2	1		2.6	1		211	1		0.015	1	
ESA1-3	J1V8F4	3/2/16	2.3	1		3.8	1		6.0	1		0.99	1		2.0	1		133	1		0.015	1	
ESA1-4	J1V8F5	3/2/16	2.9	1		3.4	1		5.6	1		1.1	1		2.0	1		126	1		0.016	1	
ESA1-5	J1V8F6	3/2/16	3.9	1		5.7	1		9.5	1		1.6	1		3.1	1		220	1		0.011	1	
ESA1-6	J1V8F7	3/2/16	4.3	1		5.5	1		8.8	1		1.5	1		3.1	1		219	1		0.011	1	
ESA1-8	J1V8F9	3/2/16	2.2	1		3.4	1		5.1	1		1.6	1		1.6	1		126	1		0.010	1	
ESA1-9	J1V8H0	3/2/16	3.4	1		4.4	1		7.3	1		1.1	1		2.1	1		155	1		0.0092	1	
ESA1-10	J1V8H1	3/2/16	3.1	1		4.0	1		6.4	1		0.94	1		1.8	1		142	1		0.0098	1	
ESA1-11	J1V8H2	3/2/16	3.4	1		4.0	1		7.0	1		1.1	1		2.7	1		176	1		0.0095	1	
ESA1-12	J1V8H3	3/2/16	2.8	1		4.1	1		6.6	1		0.7	1		1.4	1		121	1		0.0098	1	

Statistical Computations

	Chromium	Cobalt	Copper	Lead	Lithium	Manganese	Mercury
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%
Mean	3.5	4.6	7.5	1.3	2.4	173	0.013
Standard deviation	1.0	1.1	2.0	0.35	0.81	48.8	0.0036
95% UCL on mean	4.0	5.2	8.6	1.4	2.8	199	0.014
Maximum value	5.9	7.0	12.2	2.0	4.3	275	0.021

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
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Rev. No. 0
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300-288:2 Waste Site Statistical Calculations
Verification Data - East Sample Area 1

Sample Area	Sample Number	Sample Date	Nickel			Strontium			Uranium			Vanadium			Zinc			TPH - diesel range		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	5.6	X	0.11	10.4	X	0.032	0.35		0.0013	32.8	X	0.083	20.6	X	0.35	1200	J	700
Duplicate of J1V8F8	J1V8H4	3/2/16	8.8	X	0.12	19.7	X	0.036	0.35		0.0013	64.1	X	0.093	38.6	X	0.39	650	U	650
ESA1-1	J1V8F2	3/2/16	6.1	XMN	0.089	11.8	XMN	0.026	0.24	M	0.0014	41.5	XM	0.068	25.9	XN	0.29	670	U	670
ESA1-2	J1V8F3	3/2/16	8.2	X	0.12	12.3	X	0.034	0.35		0.0014	56.8	X	0.089	31.9	X	0.38	890	J	700
ESA1-3	J1V8F4	3/2/16	4.2	X	0.12	9.5	X	0.036	0.32		0.0012	36.0	X	0.095	21.7	X	0.40	740	J	680
ESA1-4	J1V8F5	3/2/16	5.5	X	0.12	8.9	X	0.035	0.34		0.0013	30.4	X	0.090	19.1	X	0.38	670	U	670
ESA1-5	J1V8F6	3/2/16	7.7	X	0.12	15.8	X	0.035	0.34		0.0015	57.1	X	0.091	34.2	X	0.38	690	J	660
ESA1-6	J1V8F7	3/2/16	7.0	X	0.11	14.5	X	0.031	0.47		0.0013	50.2	X	0.081	30.7	X	0.34	690	U	690
ESA1-8	J1V8F9	3/2/16	3.9	X	0.11	8.9	X	0.031	0.30		0.0014	32.2	X	0.082	18.7	X	0.35	680	U	680
ESA1-9	J1V8H0	3/2/16	5.8	X	0.10	11.0	X	0.030	0.36		0.0015	41.6	X	0.078	24.3	X	0.33	1500	J	700
ESA1-10	J1V8H1	3/2/16	5.6	X	0.092	10.1	X	0.027	0.39		0.0014	37.4	X	0.071	22.2	X	0.30	1100	J	680
ESA1-11	J1V8H2	3/2/16	6.1	X	0.11	15.1	X	0.034	0.30		0.0015	40.4	X	0.087	25.2	X	0.37	690	U	690
ESA1-12	J1V8H3	3/2/16	5.9	X	0.088	8.8	X	0.026	0.30		0.0016	32.9	X	0.067	18.4	X	0.28	690	U	690

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Nickel			Strontium			Uranium			Vanadium			Zinc			TPH - diesel range		
			mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		ug/kg	DS	
ESA1-7	J1V8F8/ J1V8H4	3/2/16	8.8	1		19.7	1		0.35	1		64.1	1		38.6	1		1200	1	
ESA1-1	J1V8F2	3/2/16	6.1	1		11.8	1		0.24	1		41.5	1		25.9	1		670	0	
ESA1-2	J1V8F3	3/2/16	8.2	1		12.3	1		0.35	1		56.8	1		31.9	1		890	1	
ESA1-3	J1V8F4	3/2/16	4.2	1		9.5	1		0.32	1		36.0	1		21.7	1		740	1	
ESA1-4	J1V8F5	3/2/16	5.5	1		8.9	1		0.34	1		30.4	1		19.1	1		670	0	
ESA1-5	J1V8F6	3/2/16	7.7	1		15.8	1		0.34	1		57.1	1		34.2	1		690	1	
ESA1-6	J1V8F7	3/2/16	7.0	1		14.5	1		0.47	1		50.2	1		30.7	1		690	0	
ESA1-8	J1V8F9	3/2/16	3.9	1		8.9	1		0.30	1		32.2	1		18.7	1		680	0	
ESA1-9	J1V8H0	3/2/16	5.8	1		11.0	1		0.36	1		41.6	1		24.3	1		1500	1	
ESA1-10	J1V8H1	3/2/16	5.6	1		10.1	1		0.39	1		37.4	1		22.2	1		1100	1	
ESA1-11	J1V8H2	3/2/16	6.1	1		15.1	1		0.30	1		40.4	1		25.2	1		690	0	
ESA1-12	J1V8H3	3/2/16	5.9	1		8.8	1		0.30	1		32.9	1		18.4	1		690	0	

Statistical Computations

	Nickel	Strontium	Uranium	Vanadium	Zinc	TPH - diesel range
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% KM (t) UCL
N	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	50%
Mean	6.2	12.2	0.34	43.4	25.9	851
Standard deviation	1.5	3.4	0.057	11.1	6.6	308
95% UCL on mean	7.0	14.0	0.37	49.1	29.3	1000
Maximum value	8.8	19.7	0.47	64.1	38.6	1500

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

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300-288:2 Waste Site Statistical Calculations
Verification Data - East Sample Area 2

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Arsenic			Barium			Beryllium			Cadmium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	0.413		0.0606	0.435		0.180	0.480		0.0560	0.66	U	0.66	40.2	X	0.076	0.10	B	0.033	0.11	B	0.041
Duplicate of J1V8J1	J1V8K1	3/1/16	0.320		0.0542	0.576	U	1.00	0.561		0.0542	1.1		0.64	52.7	X	0.074	0.16	B	0.032	0.11	B	0.040
ESA2-1	J1V8H9	3/1/16	0.168		0.0474	0.052	U	0.979	0.0673		0.0590	0.74	B	0.51	46.1	X	0.059	0.13	B	0.051	0.090	BM	0.032
ESA2-2	J1V8J0	3/1/16	0.0951		0.0540	0.447	U	0.917	0.0792		0.0540	1.1		0.61	65.7	X	0.070	0.15	B	0.030	0.12	B	0.038
ESA2-4	J1V8J2	3/1/16	0.256		0.0624	0.256		0.237	0.241		0.0545	1.2		0.64	68.4	X	0.073	0.20		0.032	0.13	B	0.040
ESA2-5	J1V8J3	3/1/16	0.232		0.0568	0.058	U	0.865	0.264		0.0525	1.6		0.61	52.0	X	0.070	0.15	B	0.030	0.12	B	0.038
ESA2-6	J1V8J4	3/1/16	0.672		0.0593	0.453		0.238	0.748		0.0621	1.2		0.68	67.7	X	0.078	0.17	B	0.034	0.11	B	0.042
ESA2-7	J1V8J5	3/1/16	0.159		0.0532	0.850	U	0.974	0.145		0.0491	1.0		0.59	65.6	X	0.068	0.18		0.029	0.11	B	0.036
ESA2-8	J1V8J6	3/1/16	0.283		0.0680	-0.0377	U	0.944	0.283		0.0650	1.3		0.64	63.1	X	0.074	0.17	B	0.032	0.11	B	0.040
ESA2-9	J1V8J7	3/1/16	0.376		0.0529	0.456		0.223	0.203		0.0529	1.4		0.68	65.7	X	0.079	0.21		0.034	0.12	B	0.042
ESA2-10	J1V8J8	3/1/16	0.191		0.0629	0.329		0.252	0.223		0.0547	0.66	B	0.60	53.6	X	0.069	0.16	B	0.030	0.12	B	0.037
ESA2-11	J1V8J9	3/1/16	0.135		0.0819	0.171	U	0.844	0.236		0.0695	0.56	U	0.56	52.4	X	0.065	0.14	B	0.028	0.11	B	0.035
ESA-12	J1V8K0	3/1/16	0.306		0.0641	0.534		0.229	0.146		0.0539	1.4		0.63	67.4	X	0.072	0.23		0.031	0.11	B	0.039

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Arsenic			Barium			Beryllium			Cadmium		
			pCi/g	DS		pCi/g	DS		pCi/g	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
ESA2-3	J1V8J1/ J1V8K1	3/1/16	0.413	1		0.435	1		0.561	1		1.1	1		52.7	1		0.16	1		0.11	1	
ESA2-1	J1V8H9	3/1/16	0.168	1		0.979	0		0.0673	1		0.74	1		46.1	1		0.13	1		0.090	1	
ESA2-2	J1V8J0	3/1/16	0.0951	1		0.917	0		0.0792	1		1.1	1		65.7	1		0.15	1		0.12	1	
ESA2-4	J1V8J2	3/1/16	0.256	1		0.256	1		0.241	1		1.2	1		68.4	1		0.20	1		0.13	1	
ESA2-5	J1V8J3	3/1/16	0.232	1		0.865	0		0.264	1		1.6	1		52.0	1		0.15	1		0.12	1	
ESA2-6	J1V8J4	3/1/16	0.672	1		0.453	1		0.748	1		1.2	1		67.7	1		0.17	1		0.11	1	
ESA2-7	J1V8J5	3/1/16	0.159	1		0.974	0		0.145	1		1.0	1		65.6	1		0.18	1		0.11	1	
ESA2-8	J1V8J6	3/1/16	0.283	1		0.944	0		0.283	1		1.3	1		63.1	1		0.17	1		0.11	1	
ESA2-9	J1V8J7	3/1/16	0.376	1		0.456	1		0.203	1		1.4	1		65.7	1		0.21	1		0.12	1	
ESA2-10	J1V8J8	3/1/16	0.191	1		0.329	1		0.223	1		0.66	1		53.6	1		0.16	1		0.12	1	
ESA2-11	J1V8J9	3/1/16	0.135	1		0.844	0		0.236	1		0.56	0		52.4	1		0.14	1		0.11	1	
ESA-12	J1V8K0	3/1/16	0.306	1		0.534	1		0.146	1		1.4	1		67.4	1		0.23	1		0.11	1	

Statistical Computations

	Uranium-234 (AEA)	Uranium-238 (GEA)	Uranium-238 (AEA)	Arsenic	Barium	Beryllium	Cadmium
95% UCL based on	95% Student's-t UCL	95% KM (t) UCL	95% Adjusted Gamma UCL	95% KM (t) UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12	12
% < Detection limit	0%	50%	0%	8%	0%	0%	0%
Mean	0.274	0.666	0.266	1.1	60.0	0.17	0.11
Standard deviation	0.158	0.100	0.198	0.28	8.0	0.030	0.010
95% UCL on mean	0.356	0.484	0.416	1.3	64.2	0.19	0.12
Maximum value	0.672	0.979	0.748	1.6	68.4	0.23	0.13

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
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300-288:2 Waste Site Statistical Calculations

Verification Data - East Sample Area 2

Sample Area	Sample Number	Sample Date	Chromium			Cobalt			Copper			Lead			Lithium			Manganese			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	4.1	X	0.058	5.5		0.10	9.1		0.22	1.5		0.27	2.5		0.91	210	X	0.10	0.023		0.0060
Duplicate of J1V8J1	J1V8K1	3/1/16	6.0	X	0.057	7.5		0.098	12.9		0.21	2.2		0.26	3.8		0.89	278	X	0.098	0.019		0.0059
ESA2-1	J1V8H9	3/1/16	4.8	X	0.045	5.8	M	0.15	10.9		0.34	1.7		0.42	4.1		0.70	215	X	0.077	0.030	M	0.0067
ESA2-2	J1V8J0	3/1/16	7.0	X	0.054	6.7		0.092	13.5		0.20	1.6		0.25	4.2		0.84	276	X	0.092	0.022		0.0059
ESA2-4	J1V8J2	3/1/16	5.7	X	0.056	6.8		0.096	14.9		0.21	3.0		0.26	4.4		0.88	289	X	0.096	0.016	B	0.0069
ESA2-5	J1V8J3	3/1/16	6.0	X	0.054	7.6		0.092	13.4		0.20	1.7		0.25	3.7		0.84	288	X	0.092	0.015	B	0.0060
ESA2-6	J1V8J4	3/1/16	6.4	X	0.059	7.4		0.10	13.5		0.22	2.4		0.28	4.4		0.93	299	X	0.10	0.037		0.0060
ESA2-7	J1V8J5	3/1/16	5.8	X	0.052	8.3		0.089	13.1		0.19	2.1		0.24	4.1		0.81	321	X	0.089	0.020		0.0065
ESA2-8	J1V8J6	3/1/16	4.3	X	0.056	8.4		0.097	14.5		0.21	2.0		0.26	3.5		0.88	329	X	0.097	0.017	B	0.0059
ESA2-9	J1V8J7	3/1/16	8.9	X	0.060	6.6		0.10	13.1		0.22	2.3		0.28	4.8		0.94	282	X	0.10	0.019		0.0060
ESA2-10	J1V8J8	3/1/16	6.2	X	0.053	7.6		0.091	13.0		0.20	1.7		0.25	3.6		0.83	287	X	0.091	0.014	B	0.0065
ESA2-11	J1V8J9	3/1/16	6.0	X	0.049	7.2		0.085	13.4		0.18	1.9		0.23	3.5		0.77	281	X	0.085	0.012	B	0.0060
ESA-12	J1V8K0	3/1/16	6.3	X	0.055	8.4		0.095	14.3		0.21	3.0		0.26	5.2		0.86	310	X	0.095	0.013	B	0.0069

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Chromium		Cobalt		Copper		Lead		Lithium		Manganese		Mercury	
			mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS
ESA2-3	J1V8J1/ J1V8K1	3/1/16	6.0	1	7.5	1	12.9	1	2.2	1	3.8	1	278	1	0.023	1
ESA2-1	J1V8H9	3/1/16	4.8	1	5.8	1	10.9	1	1.7	1	4.1	1	215	1	0.030	1
ESA2-2	J1V8J0	3/1/16	7.0	1	6.7	1	13.5	1	1.6	1	4.2	1	276	1	0.022	1
ESA2-4	J1V8J2	3/1/16	5.7	1	6.8	1	14.9	1	3.0	1	4.4	1	289	1	0.016	1
ESA2-5	J1V8J3	3/1/16	6.0	1	7.6	1	13.4	1	1.7	1	3.7	1	288	1	0.015	1
ESA2-6	J1V8J4	3/1/16	6.4	1	7.4	1	13.5	1	2.4	1	4.4	1	299	1	0.037	1
ESA2-7	J1V8J5	3/1/16	5.8	1	8.3	1	13.1	1	2.1	1	4.1	1	321	1	0.020	1
ESA2-8	J1V8J6	3/1/16	4.3	1	8.4	1	14.5	1	2.0	1	3.5	1	329	1	0.017	1
ESA2-9	J1V8J7	3/1/16	8.9	1	6.6	1	13.1	1	2.3	1	4.8	1	282	1	0.019	1
ESA2-10	J1V8J8	3/1/16	6.2	1	7.6	1	13.0	1	1.7	1	3.6	1	287	1	0.014	1
ESA2-11	J1V8J9	3/1/16	6.0	1	7.2	1	13.4	1	1.9	1	3.5	1	281	1	0.012	1
ESA-12	J1V8K0	3/1/16	6.3	1	8.4	1	14.3	1	3.0	1	5.2	1	310	1	0.013	1

Statistical Computations

	Chromium	Cobalt	Copper	Lead	Lithium	Manganese	Mercury
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%
Mean	6.1	7.4	13.4	2.1	4.1	288	0
Standard deviation	1.1	0.80	1.0	0.48	0.53	28.7	0.0074
95% UCL on mean	6.7	7.8	13.9	2.4	4.4	303	0.024
Maximum value	8.9	8.4	14.9	3.0	5.2	329	0.037

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

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300-288:2 Waste Site Statistical Calculations
Verification Data - East Sample Area 2

Sample Area	Sample Number	Sample Date	Molybdenum			Nickel			Strontium			Uranium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	0.26	U	0.26	6.0	X	0.12	13.4	X	0.036	0.39		0.0014	54.1	J	0.094	32.8	XJ	0.40
Duplicate of J1V8J1	J1V8K1	3/1/16	0.26	B	0.25	9.1	X	0.12	18.4	X	0.035	0.47		0.0014	71.5	J	0.092	41.7	XJ	0.39
ESA2-1	J1V8H9	3/1/16	0.44	BM	0.20	6.6	X	0.095	20.5	X	0.028	0.32	M	0.0015	57.2	MJ	0.15	38.0	NXJ	0.61
ESA2-2	J1V8J0	3/1/16	0.51	B	0.24	10.8	X	0.11	22.1	X	0.033	0.32		0.0014	69.3	J	0.087	39.0	XJ	0.37
ESA2-4	J1V8J2	3/1/16	0.28	B	0.25	8.0	X	0.12	23.1	X	0.035	0.40		0.0015	66.0	J	0.091	40.2	XJ	0.38
ESA2-5	J1V8J3	3/1/16	0.30	B	0.24	11.8	X	0.11	19.3	X	0.033	0.35		0.0014	75.9	J	0.087	41.6	XJ	0.37
ESA2-6	J1V8J4	3/1/16	0.43	B	0.27	9.7	X	0.13	20.4	X	0.037	0.64		0.0016	72.5	J	0.10	43.0	XJ	0.41
ESA2-7	J1V8J5	3/1/16	0.23	B	0.23	10.6	X	0.11	23.5	X	0.032	0.33		0.0015	66.4	J	0.084	39.0	XJ	0.35
ESA2-8	J1V8J6	3/1/16	0.27	B	0.25	8.9	X	0.12	18.9	X	0.035	0.35		0.0014	73.6	J	0.091	42.7	XJ	0.39
ESA2-9	J1V8J7	3/1/16	0.27	U	0.27	9.7	X	0.13	23.7	X	0.037	0.52		0.0015	67.0	J	0.10	40.9	XJ	0.41
ESA2-10	J1V8J8	3/1/16	0.24	B	0.24	10.8	X	0.11	20.7	X	0.033	0.36		0.0014	74.8	J	0.086	41.0	XJ	0.36
ESA2-11	J1V8J9	3/1/16	0.26	B	0.22	8.6	X	0.10	17.6	X	0.031	0.32		0.0014	71.0	J	0.080	41.1	XJ	0.34
ESA-12	J1V8K0	3/1/16	0.33	B	0.25	9.6	X	0.12	21.3	X	0.034	0.39		0.0016	66.9	J	0.089	43.1	XJ	0.38

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Molybdenum		Nickel		Strontium		Uranium		Vanadium		Zinc	
			mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS	mg/kg	DS
ESA2-3	J1V8J1/ J1V8K1	3/1/16	0.26	1	9.1	1	18.4	1	0.47	1	71.5	1	41.7	1
ESA2-1	J1V8H9	3/1/16	0.44	1	6.6	1	20.5	1	0.32	1	57.2	1	38.0	1
ESA2-2	J1V8J0	3/1/16	0.51	1	10.8	1	22.1	1	0.32	1	69.3	1	39.0	1
ESA2-4	J1V8J2	3/1/16	0.28	1	8.0	1	23.1	1	0.40	1	66.0	1	40.2	1
ESA2-5	J1V8J3	3/1/16	0.30	1	11.8	1	19.3	1	0.35	1	75.9	1	41.6	1
ESA2-6	J1V8J4	3/1/16	0.43	1	9.7	1	20.4	1	0.64	1	72.5	1	43.0	1
ESA2-7	J1V8J5	3/1/16	0.23	1	10.6	1	23.5	1	0.33	1	66.4	1	39.0	1
ESA2-8	J1V8J6	3/1/16	0.27	1	8.9	1	18.9	1	0.35	1	73.6	1	42.7	1
ESA2-9	J1V8J7	3/1/16	0.27	0	9.7	1	23.7	1	0.52	1	67.0	1	40.9	1
ESA2-10	J1V8J8	3/1/16	0.24	1	10.8	1	20.7	1	0.36	1	74.8	1	41.0	1
ESA2-11	J1V8J9	3/1/16	0.26	1	8.6	1	17.6	1	0.32	1	71.0	1	41.1	1
ESA-12	J1V8K0	3/1/16	0.33	1	9.6	1	21.3	1	0.39	1	66.9	1	43.1	1

Statistical Computations

	Molybdenum	Nickel	Strontium	Uranium	Vanadium	Zinc
95% UCL based on	95% KM (t) UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12
% < Detection limit	8%	0%	0%	0%	0%	0%
Mean	0.32	9.5	20.8	0.40	69.3	40.9
Standard deviation	0.094	1.4	2.0	0.10	5.1	1.6
95% UCL on mean	0.37	10.3	21.8	0.45	72.0	41.8
Maximum value	0.51	11.8	23.7	0.64	75.9	43.1

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

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300-288:2 Waste Site Statistical Calculations
Verification Data - West Sample Area 1

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Antimony			Arsenic			Barium			Beryllium			Cadmium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	0.283		0.0542	0.770		0.293	0.486		0.106	0.30	U	0.30	3.4		0.53	74.1	X	0.061	0.14	B	0.13	0.12	B	0.033
Duplicate of J1V902	J1V914	6/16/16	0.171		0.0975	0.060	U	1.32	0.221	U	0.240	0.35	U	0.35	3.5		0.61	74.4	X	0.071	0.16	B	0.15	0.11	B	0.038
WSA1-2	J1V903	6/16/16	0.244		0.101	0.513	U	1.46	0.240		0.106	0.33	B	0.33	3.6		0.58	74.7	X	0.067	0.20	B	0.15	0.13	B	0.036
WSA1-3	J1V904	6/16/16	0.245		0.0636	0.360		0.281	0.333		0.0732	0.38	U	0.38	3.4		0.66	71.9	X	0.076	0.18	B	0.17	0.12	B	0.041
WSA1-4	J1V905	6/16/16	0.144		0.102	0.436	U	1.11	0.190	U	0.228	0.45	B	0.33	2.4		0.58	61.3	X	0.066	0.14	U	0.14	0.10	B	0.036
WSA1-5	J1V906	6/16/16	0.274		0.126	1.280	U	1.30	0.385		0.315	0.30	U	0.30	3.3		0.52	65.6	X	0.060	0.13	U	0.13	0.11	B	0.032
WSA1-6	J1V907	6/16/16	0.431		0.0513	0.588		0.361	0.235		0.0576	0.33	B	0.29	3.7		0.50	74.8	X	0.058	0.13	U	0.13	0.12	B	0.031
WSA1-7	J1V908	6/16/16	0.164		0.0672	0.544		0.292	0.198		0.0773	0.38	B	0.27	4.0		0.47	73.0	X	0.055	0.14	B	0.12	0.13	B	0.029
WSA1-8	J1V909	6/16/16	0.295		0.0605	0.707		0.324	0.224		0.108	0.38	B	0.29	3.8		0.50	65.3	X	0.058	0.14	B	0.13	0.088	B	0.031
WSA1-9	J1V910	6/16/16	0.240		0.0567	0.579	U	1.49	0.232		0.0701	0.37	U	0.37	2.8		0.65	83.3	X	0.074	0.16	B	0.16	0.14	B	0.040
WSA1-10	J1V911	6/16/16	0.251		0.0704	0.711		0.322	0.109		0.0683	0.32	U	0.32	3.3		0.55	68.3	X	0.064	0.16	B	0.14	0.14	B	0.034
WSA1-11	J1V912	6/16/16	0.240		0.0592	0.280	U	1.10	0.188		0.0661	0.36	U	0.36	3.2		0.62	73.8	X	0.071	0.15	B	0.15	0.14	B	0.038
WSA1-12	J1V913	6/16/16	0.194		0.0878	0.054	U	1.18	0.224		0.197	0.43	B	0.31	3.0		0.54	80.3	X	0.062	0.18	B	0.13	0.085	B	0.033

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Antimony			Arsenic			Barium			Beryllium			Cadmium		
			pCi/g	DS		pCi/g	DS		pCi/g	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
WSA1-1	J1V902/J1V914	6/16/16	0.283	1		0.770	1		0.486	1		0.35	0		3.5	1		74.4	1		0.16	1		0.12	1	
WSA1-2	J1V903	6/16/16	0.244	1		1.46	0		0.240	1		0.33	1		3.6	1		74.7	1		0.20	1		0.13	1	
WSA1-3	J1V904	6/16/16	0.245	1		0.360	1		0.333	1		0.38	0		3.4	1		71.9	1		0.18	1		0.12	1	
WSA1-4	J1V905	6/16/16	0.144	1		1.11	0		0.228	0		0.45	1		2.4	1		61.3	1		0.14	0		0.10	1	
WSA1-5	J1V906	6/16/16	0.274	1		1.30	0		0.385	1		0.30	0		3.3	1		65.6	1		0.13	0		0.11	1	
WSA1-6	J1V907	6/16/16	0.431	1		0.588	1		0.235	1		0.33	1		3.7	1		74.8	1		0.13	0		0.12	1	
WSA1-7	J1V908	6/16/16	0.164	1		0.544	1		0.198	1		0.38	1		4.0	1		73.0	1		0.14	1		0.13	1	
WSA1-8	J1V909	6/16/16	0.295	1		0.707	1		0.224	1		0.38	1		3.8	1		65.3	1		0.14	1		0.09	1	
WSA1-9	J1V910	6/16/16	0.240	1		1.49	0		0.232	1		0.37	0		2.8	1		83.3	1		0.16	1		0.14	1	
WSA1-10	J1V911	6/16/16	0.251	1		0.711	1		0.109	1		0.32	0		3.3	1		68.3	1		0.16	1		0.14	1	
WSA1-11	J1V912	6/16/16	0.240	1		1.10	0		0.188	1		0.36	0		3.2	1		73.8	1		0.15	1		0.14	1	
WSA1-12	J1V913	6/16/16	0.194	1		1.18	0		0.224	1		0.43	1		3.0	1		80.3	1		0.18	1		0.09	1	

Statistical Computations

	Uranium-234 (AEA)	Uranium-238 (GEA)	Uranium-238 (AEA)	Antimony	Arsenic	Barium	Beryllium	Cadmium
95% UCL based on	95% Student's-t UCL	95% KM (t) UCL	95% KM (t) UCL	95% KM (t) UCL	95% Student's-t UCL	95% Student's-t UCL	95% KM (t) UCL	95% Student's-t UCL
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	50%	8%	50%	0%	0%	25%	0%
Mean	0.250	0.943	0.257	0.37	3.33	72.2	0.16	0.12
Standard deviation	0.0729	0.150	0.104	0.050	0.45	6.29	0.020	0.019
95% UCL on mean	0.288	0.723	0.307	0.38	3.6	75.5	0.17	0.13
Maximum value	0.431	1.49	0.486	0.45	4.0	83.3	0.20	0.14

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

Rev. No. 0
Date 07/27/16
Sheet No. 12 of 25

300-288:2 Waste Site Statistical Calculations

Verification Data - West Sample Area 1

Sample Area	Sample Number	Sample Date	Chromium			Cobalt			Copper			Lead			Lithium			Manganese			Mercury			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	11.2	X	0.046	9.2		0.40	13.3	X	0.17	6.6		0.22	7.6	N	0.73	355	X	0.080	0.010	B	0.0068	9.9	X	0.098
Duplicate of J1V902	J1V914	6/16/16	10.1	X	0.054	8.6		0.47	12.9	X	0.20	6.7		0.25	7.6		0.85	347	X	0.093	0.0090	B	0.0060	9.5	X	0.11
WSA1-2	J1V903	6/16/16	9.5	X	0.051	9.3		0.44	12.8	X	0.19	5.0		0.24	7.5		0.80	367	X	0.088	0.0085	B	0.0065	8.9	X	0.11
WSA1-3	J1V904	6/16/16	9.8	X	0.058	8.9		0.50	12.0	X	0.22	9.0		0.27	7.5		0.91	347	X	0.10	0.013	B	0.0068	9.4	X	0.12
WSA1-4	J1V905	6/16/16	8.4	X	0.051	8.6		0.44	12.0	X	0.19	4.7		0.24	6.7		0.79	315	X	0.087	0.0092	B	0.0069	8.4	X	0.11
WSA1-5	J1V906	6/16/16	8.6	X	0.045	8.7		0.39	12.6	X	0.17	5.5		0.21	6.8		0.71	328	X	0.078	0.0085	B	0.0066	9.4	X	0.096
WSA1-6	J1V907	6/16/16	9.7	X	0.044	9.5		0.38	12.8	X	0.16	7.3		0.21	7.6		0.69	367	X	0.076	0.0086	B	0.0062	9.8	X	0.093
WSA1-7	J1V908	6/16/16	9.4	X	0.042	9.0		0.36	12.3	X	0.16	9.5		0.19	7.2		0.65	336	X	0.072	0.013	B	0.0065	9.3	X	0.088
WSA1-8	J1V909	6/16/16	8.9	X	0.044	8.6		0.38	11.7	X	0.17	7.4		0.21	7.0		0.70	325	X	0.076	0.0086	B	0.0069	9.0	X	0.094
WSA1-9	J1V910	6/16/16	11.0	X	0.057	9.6		0.49	15.0	X	0.21	6.5		0.26	8.5		0.89	419	X	0.098	0.0091	B	0.0063	10.5	X	0.12
WSA1-10	J1V911	6/16/16	9.7	X	0.049	9.2		0.42	12.4	X	0.18	5.6		0.23	7.6		0.76	349	X	0.084	0.0095	B	0.0062	9.5	X	0.10
WSA1-11	J1V912	6/16/16	9.2	X	0.054	8.9		0.47	13.7	X	0.20	6.0		0.25	7.6		0.85	373	X	0.093	0.0091	B	0.0060	9.9	X	0.11
WSA1-12	J1V913	6/16/16	10.0	X	0.047	8.6		0.41	13.1	X	0.18	5.3		0.22	7.5		0.74	340	X	0.081	0.0083	B	0.0063	9.8	X	0.10

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Chromium			Cobalt			Copper			Lead			Lithium			Manganese			Mercury			Nickel		
			mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
WSA1-1	J1V902/J1V914	6/16/16	11.2	1		9.2	1		13.3	1		6.7	1		7.6	1		355	1		0.0099	1		9.9	1	
WSA1-2	J1V903	6/16/16	9.5	1		9.3	1		12.8	1		5.0	1		7.5	1		367	1		0.0085	1		8.9	1	
WSA1-3	J1V904	6/16/16	9.8	1		8.9	1		12.0	1		9.0	1		7.5	1		347	1		0.013	1		9.4	1	
WSA1-4	J1V905	6/16/16	8.4	1		8.6	1		12.0	1		4.7	1		6.7	1		315	1		0.0092	1		8.4	1	
WSA1-5	J1V906	6/16/16	8.6	1		8.7	1		12.6	1		5.5	1		6.8	1		328	1		0.0085	1		9.4	1	
WSA1-6	J1V907	6/16/16	9.7	1		9.5	1		12.8	1		7.3	1		7.6	1		367	1		0.0086	1		9.8	1	
WSA1-7	J1V908	6/16/16	9.4	1		9.0	1		12.3	1		9.5	1		7.2	1		336	1		0.013	1		9.3	1	
WSA1-8	J1V909	6/16/16	8.9	1		8.6	1		11.7	1		7.4	1		7.0	1		325	1		0.0086	1		9.0	1	
WSA1-9	J1V910	6/16/16	11.0	1		9.6	1		15.0	1		6.5	1		8.5	1		419	1		0.0091	1		10.5	1	
WSA1-10	J1V911	6/16/16	9.7	1		9.2	1		12.4	1		5.6	1		7.6	1		349	1		0.0095	1		9.5	1	
WSA1-11	J1V912	6/16/16	9.2	1		8.9	1		13.7	1		6.0	1		7.6	1		373	1		0.0091	1		9.9	1	
WSA1-12	J1V913	6/16/16	10.0	1		8.6	1		13.1	1		5.3	1		7.5	1		340	1		0.0083	1		9.8	1	

Statistical Computations

	Chromium	Cobalt	Copper	Lead	Lithium	Manganese	Mercury	Nickel
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	0%
Mean	9.6	9.0	12.8	6.5	7.4	352	0.0	9.5
Standard deviation	0.85	0.35	0.90	1.5	0.47	27.8	0.0017	0.55
95% UCL on mean	10.1	9.2	13.3	7.3	7.7	366	0.011	9.8
Maximum value	11.2	9.6	15.0	9.5	8.5	419	0.013	10.5

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

Rev. No. 0
Date 07/27/16
Sheet No. 13 of 25

300-288:2 Waste Site Statistical Calculations
Verification Data - West Sample Area 1

Sample Area	Sample Number	Sample Date	Strontium			Uranium			Vanadium			Zinc			TPH - diesel extended			TPH - diesel range		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
WSA1-1	J1V902	6/16/16	21.3	X	0.029	0.55		0.0013	54.6	X	0.075	47.7		1.6	11000	B	970	3900	B	660
Duplicate of J1V902	J1V914	6/16/16	21.0	X	0.033	0.66		0.0012	54.5	X	0.087	47.8		1.9	14000	B	960	4800	B	660
WSA1-2	J1V903	6/16/16	21.2	X	0.032	0.45		0.0011	58.8	X	0.083	49.1		1.8	26000	B	950	7200	B	640
WSA1-3	J1V904	6/16/16	19.4	X	0.036	0.50		0.0012	55.6	X	0.094	46.9		2.0	7400	B	960	3300	JB	650
WSA1-4	J1V905	6/16/16	18.4	X	0.031	0.53		0.0015	59.3	X	0.082	46.9		1.7	7500	B	960	2800	JB	650
WSA1-5	J1V906	6/16/16	18.3	X	0.028	0.46		0.0015	54.2	X	0.074	45.8		1.6	6800	B	970	3300	JB	660
WSA1-6	J1V907	6/16/16	20.6	X	0.027	0.46		0.0013	59.8	X	0.071	49.3		1.5	7900	B	960	3000	JB	650
WSA1-7	J1V908	6/16/16	20.2	X	0.026	0.59		0.0015	53.8	X	0.067	45.9		1.4	8100	B	950	3300	JB	650
WSA1-8	J1V909	6/16/16	18.7	X	0.028	0.53		0.0015	52.7	X	0.072	46.8		1.5	16000	B	960	6300	B	650
WSA1-9	J1V910	6/16/16	22.0	X	0.035	0.54		0.0011	64.9	X	0.092	49.5		1.9	7000	B	970	3400	JB	660
WSA1-10	J1V911	6/16/16	20.2	X	0.030	0.44		0.0011	57.2	X	0.079	47.7		1.7	11000	B	970	4000	B	660
WSA1-11	J1V912	6/16/16	20.6	X	0.034	0.50		0.0013	58.0	X	0.088	48.7		1.9	12000	B	1000	4800	B	700
WSA1-12	J1V913	6/16/16	20.4	X	0.029	0.49		0.0013	53.4	X	0.076	45.4		1.6	32000	B	980	8000	B	670

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Strontium			Uranium			Vanadium			Zinc			TPH - diesel extended			TPH - diesel range		
			mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		ug/kg	DS		ug/kg	DS	
WSA1-1	J1V902/J1V914	6/16/16	21.3	1		0.66	1		54.6	1		47.8	1		14000	1		4800	1	
WSA1-2	J1V903	6/16/16	21.2	1		0.45	1		58.8	1		49.1	1		26000	1		7200	1	
WSA1-3	J1V904	6/16/16	19.4	1		0.50	1		55.6	1		46.9	1		7400	1		3300	1	
WSA1-4	J1V905	6/16/16	18.4	1		0.53	1		59.3	1		46.9	1		7500	1		2800	1	
WSA1-5	J1V906	6/16/16	18.3	1		0.46	1		54.2	1		45.8	1		6800	1		3300	1	
WSA1-6	J1V907	6/16/16	20.6	1		0.46	1		59.8	1		49.3	1		7900	1		3000	1	
WSA1-7	J1V908	6/16/16	20.2	1		0.59	1		53.8	1		45.9	1		8100	1		3300	1	
WSA1-8	J1V909	6/16/16	18.7	1		0.53	1		52.7	1		46.8	1		16000	1		6300	1	
WSA1-9	J1V910	6/16/16	22.0	1		0.54	1		64.9	1		49.5	1		7000	1		3400	1	
WSA1-10	J1V911	6/16/16	20.2	1		0.44	1		57.2	1		47.7	1		11000	1		4000	1	
WSA1-11	J1V912	6/16/16	20.6	1		0.50	1		58.0	1		48.7	1		12000	1		4800	1	
WSA1-12	J1V913	6/16/16	20.4	1		0.49	1		53.4	1		45.4	1		32000	1		8000	1	

Statistical Computations

	Strontium	Uranium	Vanadium	Zinc	TPH - diesel extended	TPH - diesel range
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL
N	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%
Mean	20.1	0.51	56.9	47.5	12975	4517
Standard deviation	1.19	0.064	3.5	1.4	8152	1755
95% UCL on mean	20.7	0.55	58.7	48.2	17000	5400
Maximum value	22.0	0.66	64.9	49.5	32000	8000

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

Rev. No. 0
Date 07/27/16
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300-288:2 Waste Site Statistical Calculations
Verification Data - West Sample Area 2

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Antimony			Arsenic			Barium			Beryllium			Boron		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA2-10	J1V924	6/16/16	0.193		0.0621	0.419		0.285	0.155		0.0572	0.32	B	0.32	2.5		0.56	61.9	X	0.064	0.22		0.028	0.83	U	0.83
Duplicate of J1V924	J1V927	6/16/16	0.199		0.0564	0.564	U	1.19	0.277		0.0521	0.60		0.34	3.5		0.59	66.9	X	0.068	0.24		0.029	0.88	U	0.88
WSA2-1	J1V915	6/16/16	0.221		0.0577	0.884	U	1.04	0.204		0.0577	0.50		0.28	1.1		0.49	49.1	X	0.056	0.16		0.024	0.73	U	0.73
WSA2-2	J1V916	6/16/16	0.640		0.0516	0.127	U	1.08	0.701		0.0516	0.74	M	0.34	2.2		0.59	90.1	X	0.068	0.22		0.029	3.3	N	0.87
WSA2-3	J1V917	6/16/16	0.168		0.0472	0.258		0.247	0.207		0.0436	0.30	U	0.30	1.6		0.51	46.3	X	0.059	0.14	B	0.026	0.76	U	0.76
WSA2-4	J1V918	6/16/16	0.179		0.0669	0.385		0.218	0.161		0.0741	0.26	U	0.26	1.2		0.45	54.7	X	0.052	0.15		0.023	3.7		0.67
WSA2-5	J1V919	6/16/16	0.337		0.0688	0.480		0.259	0.402		0.0688	0.33	U	0.33	2.00		0.58	48.5	X	0.066	0.15	B	0.029	0.86	U	0.86
WSA2-6	J1V920	6/16/16	0.208		0.0786	0.405		0.257	0.289		0.0786	0.38	B	0.28	2.2		0.49	65.4	X	0.056	0.19		0.024	0.73	U	0.73
WSA2-7	J1V921	6/16/16	0.111		0.0539	-0.0294	U	1.16	0.111		0.0539	0.27	B	0.26	10.4		0.45	48.9	X	0.052	0.18		0.023	0.67	U	0.67
WSA2-8	J1V922	6/16/16	0.409		0.0654	0.546	U	0.879	0.196		0.0604	0.62	B	0.43	2.00		0.75	93.2	X	0.086	0.24		0.037	3.2		1.1
WSA2-9	J1V923	6/16/16	0.278		0.0587	0.773	U	1.07	0.346		0.0587	0.63		0.28	1.8		0.49	71.5	X	0.057	0.17		0.025	1.6		0.73
WSA2-11	J1V925	6/16/16	0.531		0.0818	0.329		0.248	0.241		0.0818	0.51	B	0.34	1.6		0.60	37.1	X	0.069	0.11	B	0.030	0.88	U	0.88
WSA2-12	J1V926	6/16/16	0.350		0.0568	0.575		0.307	0.394		0.0568	0.43	B	0.28	2.9		0.49	71.3	X	0.057	0.22		0.025	1.0	B	0.73

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Antimony			Arsenic			Barium			Beryllium			Boron		
			pCi/g	DS		pCi/g	DS		pCi/g	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
WSA2-10	J1V924/J1V927	6/16/16	0.199	1		0.419	1		0.277	1		0.60	1		3.5	1		66.9	1		0.24	1		0.88	0	
WSA2-1	J1V915	6/16/16	0.221	1		1.04	0		0.204	1		0.50	1		1.1	1		49.1	1		0.16	1		0.73	0	
WSA2-2	J1V916	6/16/16	0.640	1		1.08	0		0.701	1		0.74	1		2.2	1		90.1	1		0.22	1		3.3	1	
WSA2-3	J1V917	6/16/16	0.168	1		0.258	1		0.207	1		0.30	0		1.6	1		46.3	1		0.14	1		0.76	0	
WSA2-4	J1V918	6/16/16	0.179	1		0.385	1		0.161	1		0.26	0		1.2	1		54.7	1		0.15	1		3.7	1	
WSA2-5	J1V919	6/16/16	0.337	1		0.480	1		0.402	1		0.33	0		2.0	1		48.5	1		0.15	1		0.86	0	
WSA2-6	J1V920	6/16/16	0.208	1		0.405	1		0.289	1		0.38	1		2.2	1		65.4	1		0.19	1		0.73	0	
WSA2-7	J1V921	6/16/16	0.111	1		1.16	0		0.111	1		0.27	1		10.4	1		48.9	1		0.18	1		0.67	0	
WSA2-8	J1V922	6/16/16	0.409	1		0.879	0		0.196	1		0.62	1		2.0	1		93.2	1		0.24	1		3.2	1	
WSA2-9	J1V923	6/16/16	0.278	1		1.07	0		0.346	1		0.63	1		1.8	1		71.5	1		0.17	1		1.6	1	
WSA2-11	J1V925	6/16/16	0.531	1		0.329	1		0.241	1		0.51	1		1.6	1		37.1	1		0.11	1		0.88	0	
WSA2-12	J1V926	6/16/16	0.350	1		0.575	1		0.394	1		0.43	1		2.9	1		71.3	1		0.22	1		1.0	1	

Statistical Computations

	Uranium-234 (AEA)	Uranium-238 (GEA)	Uranium-238 (AEA)	Antimony	Arsenic	Barium	Beryllium	Boron
95% UCL based on	95% Student's-t UCL	95% KM (t) UCL	95% Student's-t UCL	95% KM (t) UCL	95% Chebyshev (Mean, Sd) UCL	95% Student's-t UCL	95% Student's-t UCL	95% KM (t) UCL
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	42%	0%	25%	0%	0%	0%	58%
Mean	0.303	0.673	0.294	0.46	2.7	61.9	0.18	1.5
Standard deviation	0.159	0.102	0.157	0.15	2.5	17.6	0.042	1.2
95% UCL on mean	0.385	0.477	0.375	0.55	5.9	71.1	0.20	2.1
Maximum value	0.640	1.16	0.701	0.74	10.4	93.2	0.24	3.7

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson

Project 300 Area Closure Operations

Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244

Checked J. M. Capron

Job No. 14655

Rev. No. 0

Date 07/27/16

Sheet No. 15 of 25

300-288:2 Waste Site Statistical Calculations

Verification Data - West Sample Area 2

Sample Area	Sample Number	Sample Date	Cadmium			Chromium			Cobalt			Copper			Lead			Lithium			Manganese			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	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA2-10	J1V924	6/16/16	0.19		0.035	6.5	X	0.049	6.8	X	0.084	12.1		0.18	4.3		0.23	6.1		0.77	273	X	0.084	0.22	U	0.22
Duplicate of J1V924	J1V927	6/16/16	0.20		0.037	7.2	X	0.052	7.3	X	0.089	14.0		0.19	5.0		0.24	6.8		0.81	313	X	0.089	0.23	U	0.23
WSA2-1	J1V915	6/16/16	0.17		0.030	5.2	X	0.043	7.4	X	0.074	12.6		0.16	2.0		0.20	4.0		0.67	245	X	0.074	0.52	B	0.19
WSA2-2	J1V916	6/16/16	0.21	M	0.036	3.8	X	0.052	8.2	X	0.089	13.7		0.19	3.3		0.24	4.0		0.81	277	X	0.089	0.37	BM	0.23
WSA2-3	J1V917	6/16/16	0.13	B	0.032	3.6	X	0.045	5.5	X	0.078	11.5		0.17	2.0		0.21	4.2		0.71	206	X	0.078	0.20	B	0.20
WSA2-4	J1V918	6/16/16	0.15		0.028	4.4	X	0.040	6.5	X	0.068	11.4		0.15	1.7		0.18	4.3		0.62	216	X	0.068	0.18	U	0.18
WSA2-5	J1V919	6/16/16	0.16	B	0.036	6.3	X	0.051	5.4	X	0.087	11.6		0.19	2.3		0.24	5.3		0.79	221	X	0.087	0.23	U	0.23
WSA2-6	J1V920	6/16/16	0.18		0.030	7.0	X	0.043	7.4	X	0.074	13.4		0.16	2.5		0.20	5.1		0.68	261	X	0.074	0.21	B	0.19
WSA2-7	J1V921	6/16/16	0.14		0.028	8.2	X	0.040	4.9	X	0.068	10.9		0.15	3.2		0.18	6.4		0.62	219	X	0.068	0.61	B	0.18
WSA2-8	J1V922	6/16/16	0.21	B	0.046	5.2	X	0.066	8.9	X	0.11	17.1		0.25	3.1		0.31	6.3		1.0	346	X	0.11	0.29	U	0.29
WSA2-9	J1V923	6/16/16	0.21		0.031	5.5	X	0.043	6.5	X	0.075	13.4		0.16	2.5		0.20	5.3		0.68	231	X	0.075	0.19	U	0.19
WSA2-11	J1V925	6/16/16	0.12	B	0.037	4.6	X	0.052	4.8	X	0.090	9.0		0.20	1.9		0.24	3.8		0.82	196	X	0.090	0.23	U	0.23
WSA2-12	J1V926	6/16/16	0.19		0.031	9.7	X	0.043	5.5	X	0.075	13.0		0.16	6.2		0.20	7.3		0.68	271	X	0.075	0.19	U	0.19

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Cadmium			Chromium			Cobalt			Copper			Lead			Lithium			Manganese			Molybdenum		
			mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS	
WSA2-10	J1V924/J1V927	6/16/16	0.20	1		7.2	1		7.3	1		14.0	1		5.0	1		6.8	1		313	1		0.23	0	
WSA2-1	J1V915	6/16/16	0.17	1		5.2	1		7.4	1		12.6	1		2.0	1		4.0	1		245	1		0.52	1	
WSA2-2	J1V916	6/16/16	0.21	1		3.8	1		8.2	1		13.7	1		3.3	1		4.0	1		277	1		0.37	1	
WSA2-3	J1V917	6/16/16	0.13	1		3.6	1		5.5	1		11.5	1		2.0	1		4.2	1		206	1		0.20	1	
WSA2-4	J1V918	6/16/16	0.15	1		4.4	1		6.5	1		11.4	1		1.7	1		4.3	1		216	1		0.18	0	
WSA2-5	J1V919	6/16/16	0.16	1		6.3	1		5.4	1		11.6	1		2.3	1		5.3	1		221	1		0.23	0	
WSA2-6	J1V920	6/16/16	0.18	1		7.0	1		7.4	1		13.4	1		2.5	1		5.1	1		261	1		0.21	1	
WSA2-7	J1V921	6/16/16	0.14	1		8.2	1		4.9	1		10.9	1		3.2	1		6.4	1		219	1		0.61	1	
WSA2-8	J1V922	6/16/16	0.21	1		5.2	1		8.9	1		17.1	1		3.1	1		6.3	1		346	1		0.29	0	
WSA2-9	J1V923	6/16/16	0.21	1		5.5	1		6.5	1		13.4	1		2.5	1		5.3	1		231	1		0.19	0	
WSA2-11	J1V925	6/16/16	0.12	1		4.6	1		4.8	1		9.0	1		1.9	1		3.8	1		196	1		0.23	0	
WSA2-12	J1V926	6/16/16	0.19	1		9.7	1		5.5	1		13.0	1		6.2	1		7.3	1		271	1		0.19	0	

Statistical Computations

	Cadmium	Chromium	Cobalt	Copper	Lead	Lithium	Manganese	Molybdenum
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% KM (t) UCL
N	12	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%	58%
Mean	0.17	5.9	6.5	12.6	3.0	5.2	250	0.29
Standard deviation	0.033	1.8	1.3	2.0	1.4	1.2	45.4	0.18
95% UCL on mean	0.19	6.9	7.2	13.7	3.7	5.9	274	0.35
Maximum value	0.21	9.7	8.9	17.1	6.2	7.3	346	0.61

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

Rev. No. 0
Date 07/27/16
Sheet No. 16 of 25

300-288:2 Waste Site Statistical Calculations

Verification Data - West Sample Area 2

Sample Area	Sample Number	Sample Date	Nickel			Strontium			Uranium			Vanadium			Zinc			TPH - diesel extended			TPH - diesel range		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
WSA2-10	J1V924	6/16/16	8.1	X	0.10	19.6	X	0.030	0.46		0.0012	50.7		0.079	39.6	X	0.34	4500	B	970	1900	JB	660
Duplicate of J1V924	J1V927	6/16/16	8.9	X	0.11	21.2	X	0.032	0.46		0.0015	57.5		0.084	44.4	X	0.36	7300	B	1000	2200	JB	710
WSA2-1	J1V915	6/16/16	7.5	X	0.091	15.8	X	0.027	0.41		0.0012	64.9		0.070	41.5	X	0.30	1800	JB	1000	1000	JB	680
WSA2-2	J1V916	6/16/16	6.6	X	0.11	38.4	XM	0.032	0.49	M	0.0012	76.3		0.084	48.1	NX	0.35	2500	JB	970	1500	JB	660
WSA2-3	J1V917	6/16/16	5.9	X	0.096	16.4	X	0.028	0.41		0.0013	51.5		0.073	33.3	X	0.31	1700	JB	990	970	JB	670
WSA2-4	J1V918	6/16/16	6.0	X	0.084	20.2	X	0.025	0.35		0.0014	53.2		0.064	35.1	X	0.27	2100	JB	940	1400	JB	640
WSA2-5	J1V919	6/16/16	8.6	X	0.11	24.5	X	0.031	0.35		0.0014	48.9		0.082	34.9	X	0.35	3300	JB	940	1800	JB	640
WSA2-6	J1V920	6/16/16	11.8	X	0.091	24.0	X	0.027	0.35		0.0011	65.1		0.070	42.4	X	0.30	2700	JB	970	1700	JB	660
WSA2-7	J1V921	6/16/16	7.8	X	0.084	22.2	X	0.025	0.36		0.0014	38.8		0.064	32.3	X	0.27	4000	B	980	1900	JB	660
WSA2-8	J1V922	6/16/16	8.3	X	0.14	35.3	X	0.041	0.52		0.0018	80.7		0.11	54.6	X	0.45	3400	JB	1200	2000	JB	850
WSA2-9	J1V923	6/16/16	6.8	X	0.092	25.8	X	0.027	0.44		0.0011	54.8		0.070	39.9	X	0.30	2600	JB	960	1800	JB	650
WSA2-11	J1V925	6/16/16	5.7	X	0.11	15.7	X	0.032	0.48		0.0013	44.3		0.085	30.7	X	0.36	8500	B	1000	3300	JB	680
WSA2-12	J1V926	6/16/16	10.0	X	0.092	24.1	X	0.027	0.70		0.0014	46.9		0.070	45.0	X	0.30	65000	B	990	23000	B	680

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Nickel			Strontium			Uranium			Vanadium			Zinc			TPH - diesel extended			TPH - diesel range		
			mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		mg/kg	DS		ug/kg	DS		ug/kg	DS	
WSA2-10	J1V924/J1V927	6/16/16	8.9	1		21.2	1		0.46	1		57.5	1		44.4	1		7300	1		2200	1	
WSA2-1	J1V915	6/16/16	7.5	1		15.8	1		0.41	1		64.9	1		41.5	1		1800	1		1000	1	
WSA2-2	J1V916	6/16/16	6.6	1		38.4	1		0.49	1		76.3	1		48.1	1		2500	1		1500	1	
WSA2-3	J1V917	6/16/16	5.9	1		16.4	1		0.41	1		51.5	1		33.3	1		1700	1		970	1	
WSA2-4	J1V918	6/16/16	6.0	1		20.2	1		0.35	1		53.2	1		35.1	1		2100	1		1400	1	
WSA2-5	J1V919	6/16/16	8.6	1		24.5	1		0.35	1		48.9	1		34.9	1		3300	1		1800	1	
WSA2-6	J1V920	6/16/16	11.8	1		24.0	1		0.35	1		65.1	1		42.4	1		2700	1		1700	1	
WSA2-7	J1V921	6/16/16	7.8	1		22.2	1		0.36	1		38.8	1		32.3	1		4000	1		1900	1	
WSA2-8	J1V922	6/16/16	8.3	1		35.3	1		0.52	1		80.7	1		54.6	1		3400	1		2000	1	
WSA2-9	J1V923	6/16/16	6.8	1		25.8	1		0.44	1		54.8	1		39.9	1		2600	1		1800	1	
WSA2-11	J1V925	6/16/16	5.7	1		15.7	1		0.48	1		44.3	1		30.7	1		8500	1		3300	1	
WSA2-12	J1V926	6/16/16	10.0	1		24.1	1		0.70	1		46.9	1		45.0	1		65000	1		23000	1	

Statistical Computations

	Nickel	Strontium	Uranium	Vanadium	Zinc	TPH - diesel extended	TPH - diesel range
95% UCL based on	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Student's-t UCL	95% Chebyshev (Mean, Sd) UCL	95% Chebyshev (Mean, Sd) UCL
N	12	12	12	12	12	12	12
% < Detection limit	0%	0%	0%	0%	0%	0%	0%
Mean	7.8	23.6	0.44	56.9	40.2	8742	3548
Standard deviation	1.8	7.1	0.10	12.7	7.2	17845	6156
95% UCL on mean	8.8	27.3	0.50	63.5	43.9	31000	11293
Maximum value	11.8	38.4	0.70	80.7	54.6	65000	23000

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

Rev. No. 0
Date 07/27/16
Sheet No. 17 of 25

Duplicate/Split Analysis - 300-288:2 East Sample Area 1

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Uranium-234 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Aluminum		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	10.2		0.202	0.338		0.0362	0.420		0.0772	0.124		0.0572	0.353		0.224	0.344		0.053	2300	X	1.4
Duplicate of J1V8F8	J1V8H4	3/2/16	9.51		0.184	0.284		0.0321	0.557		0.0716	0.275		0.0549	0.311		0.200	0.162		0.055	4340	X	1.5
Split of J1V8F8	J1V8K2	3/2/16	12.43		0.88	0.579		0.060	0.703		0.410	0.727		0.080	0.867	U	1.42	0.646		0.070	3840		6.92

Analysis:

TDL		0.5	0.1	0.1	1	1	1	5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	7.0%						*61.4%*
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)		No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	19.7%						*50.2%*
	Difference > 2 TDL?	Not applicable	**Yes - assess further**	**Yes - assess further**	No - acceptable	No - acceptable	No - acceptable	Not applicable

Duplicate/Split Analysis - 300-288:2 East Sample Area 1

Sampling Area	Sample Number	Sample Date	Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Copper		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	27.2	X	0.067	0.10	B	0.029	0.061	B	0.036	2570	X	12.4	3.6	X	0.051	3.6	X	0.088	5.6		0.19
Duplicate of J1V8F8	J1V8H4	3/2/16	54.5	X	0.075	0.18	B	0.033	0.10	B	0.041	5050	X	14.0	5.9	X	0.057	7.0	X	0.099	12.2		0.22
Split of J1V8F8	J1V8K2	3/2/16	54.4		0.102	1.26		0.102	1.02	DU	1.02	5020	M	8.14	5.49		0.153	9.57	D	1.53	13.0		0.31

Analysis:

TDL		2	0.5	0.5	100	1	2	1
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	*66.8%*			*65.1%*			*74.2%*
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	**Yes - assess further**	No - acceptable	Not applicable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)		**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	*66.7%*			*64.6%*			*79.6%*
	Difference > 2 TDL?	Not applicable	**Yes - assess further**	No - acceptable	Not applicable	No - acceptable	**Yes - assess further**	Not applicable

Duplicate/Split Analysis - 300-288:2 East Sample Area 1

Sampling Area	Sample Number	Sample Date	Iron			Lead			Lithium			Magnesium			Manganese			Mercury			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	11000	X	3.3	1.0		0.24	2.2		0.80	2130	X	3.2	141	X	0.088	0.011	B	0.0061	5.6	X	0.11
Duplicate of J1V8F8	J1V8H4	3/2/16	21200	X	3.8	2.0		0.27	4.3		0.90	3970	X	3.7	275	X	0.099	0.013	B	0.0060	8.8	X	0.12
Split of J1V8F8	J1V8K2	3/2/16	24300	M	8.1	3.73	C	0.336	4.64	D	0.414	4330		8.65	286	M	0.203	0.0042	U	0.0042	8.32		0.153

Analysis:

TDL		5	5	2.5	75	5	0.2	4
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	*63.4%*			*60.3%*	*64.4%*		
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**		No-Stop (acceptable)
	RPD	*75.4%*			*68.1%*	*67.9%*		
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable

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Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
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Duplicate/Split Analysis - 300-288:2 East Sample Area 1

Sampling Area	Sample Number	Sample Date	Potassium			Silicon			Sodium			Strontium			Uranium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	313		36.0	259	N	5.0	171		51.8	10.4	X	0.032	0.35		0.0013	32.8	X	0.083	20.6	X	0.35
Duplicate of J1V8F8	J1V8H4	3/2/16	572		40.6	228	N	5.6	332		58.5	19.7	X	0.036	0.35		0.0013	64.1	X	0.093	38.6	X	0.39
Split of J1V8F8	J1V8K2	3/2/16	615		6.51	428	N	1.53	272		7.12	19.5	M	0.102	0.372	D	0.0137	83.0	DN	1.02	51.1	D	4.07

Analysis:

		Potassium	Silicon	Sodium	Strontium	Uranium	Vanadium	Zinc
TDL		400	2	50	1	1	2.5	1
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD		*12.7%*		*61.8%*		*64.6%*	*60.8%*
	Difference > 2 TDL?	No - acceptable	Not applicable	**Yes - assess further**	Not applicable	No - acceptable	Not applicable	Not applicable
Split Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD		*49.2%*		*60.9%*		*86.7%*	*85.1%*
	Difference > 2 TDL?	No - acceptable	Not applicable	**Yes - assess further**	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate/Split Analysis - 300-288:2 East Sample Area 1

Sampling Area	Sample Number	Sample Date	Zirconium			TPH - diesel range		
			mg/kg	Q	PQL	ug/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	10.5	X	0.31	1200	J	700
Duplicate of J1V8F8	J1V8H4	3/2/16	19.9	X	0.35	650	U	650
Split of J1V8F8	J1V8K2	3/2/16	20.6	D	0.518	2660	J	2260

Analysis:

		Zirconium	TPH - diesel range
TDL		2.5	5000
Duplicate Analysis	Both > PQL?	**Yes (continue)**	No-Stop (acceptable)
	Both >5xTDL?	No-Stop (acceptable)	
	RPD		
	Difference > 2 TDL?	**Yes - assess further**	No - acceptable
Split Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)
	RPD		
	Difference > 2 TDL?	**Yes - assess further**	No - acceptable

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Washington Closure Hanford

Originator R. J. Nielson
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

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Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Uranium-234 (AEA)			Uranium-238 (AEA)			Aluminum			Barium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	9.42		0.182	0.288		0.0293	0.509		0.064	0.413		0.0606	0.480		0.0560	3030	X	1.5	40.2	X	0.076
Duplicate of J1V8J1	J1V8K1	3/1/16	9.71		0.176	0.284		0.0318	0.465		0.067	0.320		0.0542	0.561		0.0542	4210	X	1.5	52.7	X	0.074
Split of J1V8J1	J1V8K3	3/1/16	13.9		1.06	0.606		0.210	0.548	U	0.64	0.739		0.070	0.564		0.060	3060		7.1	46.5		0.104

Analysis:

TDL		0.5	0.1	0.1	1	1	5	2
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD	3.0%					*32.6%*	26.9%
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable
Split Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD	*38.5%*		7.4%			1.0%	14.5%
	Difference > 2 TDL?	Not applicable	**Yes - assess further**	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Beryllium			Cadmium			Calcium			Chromium			Cobalt			Copper			Iron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	0.10	B	0.033	0.11	B	0.041	3720	XJ	14.1	4.1	X	0.058	5.5		0.10	9.1		0.22	17900	X	3.8
Duplicate of J1V8J1	J1V8K1	3/1/16	0.16	B	0.032	0.11	B	0.040	4850	XJ	13.8	6.0	X	0.057	7.5		0.098	12.9		0.21	22800	X	3.7
Split of J1V8J1	J1V8K3	3/1/16	1.26		0.104	1.04	DU	1.04	4460	M	8.35	4.26		0.157	8.91	D	1.57	13.2		0.313	24100	M	8.35

Analysis:

TDL		0.5	0.5	100	1	2	1	5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD			26.4%			*34.5%*	24.1%
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable
Split Analysis	Both > PQL?	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)		**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD			18.1%			*36.8%*	29.5%
	Difference > 2 TDL?	**Yes - assess further**	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable

Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Lead			Lithium			Magnesium			Manganese			Mercury			Nickel			Potassium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	1.5		0.27	2.5		0.91	3010		3.7	210		0.10	0.023		0.0060	6.0	X	0.12	405		41.0
Duplicate of J1V8J1	J1V8K1	3/1/16	2.2		0.26	3.8		0.89	4130		3.6	278	X	0.098	0.019		0.0059	9.1	X	0.12	586		40.0
Split of J1V8J1	J1V8K3	3/1/16	3.68	C	0.344	3.21	D	0.407	3750		8.87	274	M	0.209	0.0041	U	0.0041	7.48		0.157	514		6.68

Analysis:

TDL		5	2.5	75	5	0.2	4	400
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	No-Stop (acceptable)
	RPD			*31.4%*	27.9%			
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable
Split Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**		No-Stop (acceptable)	No-Stop (acceptable)
	RPD			21.9%	26.4%			
	Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable

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Washington Closure Hanford

Originator R. J. Nielson RN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

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Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Silicon			Sodium			Strontium			Uranium			Vanadium			Zinc			Zirconium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	129	J	5.7	207		59.0	13.4	X	0.036	0.39		0.0014	54.1	J	0.094	32.8	XJ	0.40	17.6	XJ	0.35
Duplicate of J1V8J1	J1V8K1	3/1/16	197	J	5.5	283		57.6	18.4	X	0.035	0.47		0.0014	71.5	J	0.092	41.7	XJ	0.39	23.1	XJ	0.35
Split of J1V8J1	J1V8K3	3/1/16	424	N	1.57	198		7.31	15.5	M	0.104	0.427	D	0.0134	76.6	DN	1.04	48.1	D	4.18	22.2	D	0.509

Analysis:

TDL		2	50	1	1	2.5	1	2.5
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD	*41.7%*		*31.4%*		27.7%	23.9%	27.0%
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	Not applicable
Split Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD	*106.7%*		14.5%		34.4%	*37.8%*	23.1%
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	Not applicable

Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	TPH - diesel range			Aroclor-1254		
			ug/kg	Q	PQL	ug/kg	Q	PQL
ESA2-3	J1V8J1	3/1/16	670	J	670	13		2.6
Duplicate of J1V8J1	J1V8K1	3/1/16	1300	J	670	12		2.7
Split of J1V8J1	J1V8K3	3/1/16	3490	J	2260	6.14		1.16

Analysis:

TDL		5000	20
Duplicate Analysis	Both > PQL?	No-Stop (acceptable)	**Yes (continue)**
	Both >5xTDL?		No-Stop (acceptable)
	RPD		
	Difference > 2 TDL?	No - acceptable	No - acceptable
Split Analysis	Both > PQL?	No-Stop (acceptable)	**Yes (continue)**
	Both >5xTDL?		No-Stop (acceptable)
	RPD		
	Difference > 2 TDL?	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RJN
Project 300 Area Closure Operations
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Duplicate/Split Analysis - 300-288:2 West Sample Area 1

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Uranium-234 (AEA)			Uranium-238 (AEA)			Aluminum			Arsenic		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	13.8		0.263	0.475		0.0425	0.832		0.093	0.283		0.0542	0.486		0.106	8350	X	1.2	3.40		0.53
Duplicate of J1V902	J1V914	6/16/16	13.7		0.196	0.543		0.0411	0.822		0.0747	0.171		0.0975	0.221	U	0.240	8430	X	1.4	3.50		0.61
Split of J1V902	J1V928	6/16/16	14.5		0.277	0.566		0.140	0.844		0.230	0.719		0.130	0.485		0.15	6340		6.96	3.3	BD	2.56

Analysis:

TDL		0.5	0.1	0.1	1	1	5	10
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)		**Yes (calc RPD)**	No-Stop (acceptable)
	RPD	0.7%		1.2%			1.0%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD	4.9%		1.4%			27.4%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate/Split Analysis - 300-288:2 West Sample Area 1

Sampling Area	Sample Number	Sample Date	Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Copper		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	74.1	X	0.061	0.14	B	0.13	0.12	B	0.033	4550	X	11.3	11.2	X	0.046	9.2		0.40	13.3	X	0.17
Duplicate of J1V902	J1V914	6/16/16	74.4	X	0.071	0.16	B	0.15	0.11	B	0.038	4000	X	13.1	10.1	X	0.054	8.6		0.47	12.9	X	0.20
Split of J1V902	J1V928	6/16/16	71.0		0.102	0.694	BD	0.512	0.34	B	0.102	3710		8.19	9.37		0.154	9.89		0.154	13.9		0.307

Analysis:

TDL		2	0.5	0.5	100	1	2	1
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	0.4%			12.9%	10.3%		3.1%
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**
	RPD	4.3%			20.3%	17.8%		4.4%
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable

Duplicate/Split Analysis - 300-288:2 West Sample Area 1

Sampling Area	Sample Number	Sample Date	Iron			Lead			Lithium			Magnesium			Manganese			Mercury			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	23900	X	3.0	6.6		0.22	7.6	N	0.73	4500	X	3.0	355	X	0.080	0.010	B	0.0068	9.9	X	0.098
Duplicate of J1V902	J1V914	6/16/16	23600	X	3.5	6.7		0.25	7.6		0.85	4260	X	3.4	347	X	0.093	0.0090	B	0.0060	9.5	X	0.11
Split of J1V902	J1V928	6/16/16	22200		8.2	5.73		0.338	9.32	D	0.393	4280		8.7	346		0.205	0.00638	B	0.00348	8.61		0.154

Analysis:

TDL		5	5	2.5	75	5	0.2	4
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	1.3%			5.5%	2.3%		
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	7.4%			5.0%	2.6%		
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

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Duplicate/Split Analysis - 300-288:2 West Sample Area 1

Sampling Area	Sample Number	Sample Date	Potassium			Silicon			Sodium			Strontium			Uranium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	1390		32.8	342	XN	4.5	223		47.2	21.3	X	0.029	0.55		0.0013	54.6	X	0.075	47.7		1.6
Duplicate of J1V902	J1V914	6/16/16	1440		38.1	319	X	5.3	239		54.9	21.0	X	0.033	0.66		0.0012	54.5	X	0.087	47.8		1.9
Split of J1V902	J1V928	6/16/16	1240		6.55	359	N	1.54	132		7.17	17.5		0.102	0.95	*D	0.013	58.1		0.102	44.7		0.41

Analysis:

		Potassium	Silicon	Sodium	Strontium	Uranium	Vanadium	Zinc
TDL		400	2	50	1	1	2.5	1
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD		7.0%		1.4%		0.2%	0.2%
	Difference > 2 TDL?	No - acceptable	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable
Split Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**
	RPD		4.9%		19.6%		6.2%	6.5%
	Difference > 2 TDL?	No - acceptable	Not applicable	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable

Duplicate/Split Analysis - 300-288:2 West Sample Area 1

Sampling Area	Sample Number	Sample Date	Zirconium			TPH - diesel extended			TPH - diesel range		
			mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
WSA1-1	J1V902	6/16/16	22.2	X	0.28	11000	B	970	3900	B	660
Duplicate of J1V902	J1V914	6/16/16	22.4	X	0.33	14000	B	960	4800	B	660
Split of J1V902	J1V928	6/16/16	29.5	D	0.491				2200	U	2200

Analysis:

		Zirconium	TPH - diesel extended	TPH - diesel range
TDL		2.5	5000	5000
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
	RPD	0.9%		
	Difference > 2 TDL?	Not applicable	No - acceptable	No - acceptable
Split Analysis	Both > PQL?	**Yes (continue)**		No-Stop (acceptable)
	Both >5xTDL?	**Yes (calc RPD)**		
	RPD	28.2%		
	Difference > 2 TDL?	Not applicable		No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron
Job No. 14655

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Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Uranium-234			Uranium-238 (AEA)			Aluminum			Antimony		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA2-10	J1V924	6/16/16	11.3		0.222	0.392		0.0382	0.645		0.0749	0.193		0.062	0.155		0.057	5840	X	1.3	0.32	B	0.32
Duplicate of J1V924	J1V927	6/16/16	12.8		0.176	0.426		0.0519	0.733		0.102	0.199		0.056	0.277		0.052	6160	X	1.4	0.60		0.34
Split of J1V924	J1V929	6/16/16	11.3		0.79	0.597		0.170	0.609		0.300	0.673		0.060	0.45		0.060	4800		6.6	1.6	DU	1.6

Analysis:

TDL		0.5	0.1	0.1	1	1	5	6
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)
	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	
	RPD	12.4%		12.8%			5.3%	
	Difference > 2 TDL?	Not applicable	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	
	RPD	0.3%		5.7%			19.5%	
	Difference > 2 TDL?	Not applicable	**Yes - assess further**	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA2-10	J1V924	6/16/16	2.50		0.56	61.9	X	0.064	0.22		0.028	0.19		0.035	4400	X	11.9	6.5	X	0.049	6.8	X	0.084
Duplicate of J1V924	J1V927	6/16/16	3.50		0.59	66.9	X	0.068	0.24		0.029	0.20		0.037	4690	X	12.6	7.2	X	0.052	7.3	X	0.089
Split of J1V924	J1V929	6/16/16	3.21	BD	2.43	59.0		0.0971	0.778	BD	0.486	0.341	B	0.0971	4500		7.77	7.14		0.146	10.6		0.146

Analysis:

TDL		10	2	0.5	0.5	100	1	2
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD		7.8%			6.4%	10.2%	
	Difference > 2 TDL?	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
Split Analysis	Both >5xTDL?	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD		4.8%			2.2%	9.4%	
	Difference > 2 TDL?	No - acceptable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

Duplicate/Split Analysis - 300-288:2 East Sample Area 2

Sampling Area	Sample Number	Sample Date	Copper			Iron			Lead			Lithium			Magnesium			Manganese			Mercury		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA2-10	J1V924	6/16/16	12.1		0.18	22900	X	3.2	4.3		0.23	6.1		0.77	3700		3.1	273	X	0.084	0.0080	B	0.0063
Duplicate of J1V924	J1V927	6/16/16	14.0		0.19	26200	X	3.4	5.0		0.24	6.8		0.81	4260		3.3	313	X	0.089	0.0077	B	0.0064
Split of J1V924	J1V929	6/16/16	14.2		0.291	22400		7.77	3.38		0.32	6.5	D	0.38	4010		8.25	318		0.194	0.00396	U	0.00396

Analysis:

TDL		1	5	5	2.5	75	5	0.2
Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
	Both >5xTDL?	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)
	RPD	14.6%	13.4%			14.1%	13.7%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable
	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)
Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	
	RPD	16.0%	2.2%			8.0%	15.2%	
	Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford

Originator R. J. Nielson RN
Project 300 Area Closure Operations
Subject 300-288:2 Subsite Cleanup Verification 95% UCL Calculations

Calc. No. 0300X-CA-V0244
Checked J. M. Capron JMC
Job No. 14655

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1 **Duplicate/Split Analysis - 300-288:2 East Sample Area 2**

	Sampling	Sample	Sample	Nickel			Potassium			Silicon			Sodium			Strontium			Uranium			Vanadium		
	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
4	WSA2-10	J1V924	6/16/16	8.1	X	0.10	977		34.6	206		4.8	275		49.8	19.6	X	0.030	0.46		0.0012	50.7		0.079
5	Duplicate of J1V924	J1V927	6/16/16	8.9	X	0.11	1020		36.6	257		5.1	280		52.7	21.2	X	0.032	0.46		0.0015	57.5		0.084
6	Split of J1V924	J1V929	6/16/16	7.09		0.146	892		6.21	326	N	1.46	167		6.8	17.6		0.0971	0.471	*D	0.0126	65.3		0.0971

7 **Analysis:**

8	**TDL**		4	400	2	50	1	1	2.5
9	Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
10		Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**
11		RPD			22.0%	1.8%	7.8%		12.6%
12		Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	Not applicable	Not applicable	No - acceptable	Not applicable
13									
14		Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
15	Split Analysis	Both >5xTDL?	No-Stop (acceptable)	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**	No-Stop (acceptable)	**Yes (calc RPD)**
16		RPD			*45.1%*		10.8%		25.2%
17		Difference > 2 TDL?	No - acceptable	No - acceptable	Not applicable	**Yes - assess further**	Not applicable	No - acceptable	Not applicable

18

19 **Duplicate/Split Analysis - 300-288:2 East Sample Area 2**

	Sampling	Sample	Sample	Zinc			Zirconium			TPH - diesel extended			TPH - diesel range		
	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
22	WSA2-10	J1V924	6/16/16	39.6	X	0.34	22.1	X	0.30	4500	B	970	1900	JB	660
23	Duplicate of J1V924	J1V927	6/16/16	44.4	X	0.36	24.0	X	0.32	7300	B	1000	2200	JB	710
24	Split of J1V924	J1V929	6/16/16	39.2		0.388	24.1	D	0.476				2170	U	2170

25 **Analysis:**

26	**TDL**		1	2.5	5000	5000
27	Duplicate Analysis	Both > PQL?	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**	**Yes (continue)**
28		Both >5xTDL?	**Yes (calc RPD)**	**Yes (calc RPD)**	No-Stop (acceptable)	No-Stop (acceptable)
29		RPD	11.4%	8.2%		
30		Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable
31						
32		Both > PQL?	**Yes (continue)**	**Yes (continue)**	No-Stop (acceptable)	No-Stop (acceptable)
33	Split Analysis	Both >5xTDL?	**Yes (calc RPD)**	**Yes (calc RPD)**		
34		RPD	1.0%	8.7%		
35		Difference > 2 TDL?	Not applicable	Not applicable	No - acceptable	No - acceptable

CALCULATION SHEET

Washington Closure Hanford					
Originator	R. J. Nielson	**Calc. No.**	0300X-CA-V0244	**Rev. No.**	0
Project	300 Area Closure Operations	**Checked**	J. M. Capron	**Date**	07/27/16
Subject	300-288:2 Subsite Cleanup Verification 95% UCL Calculations	**Job No.**	14655	**Sheet No.**	25 of 25

300-288:2 Subsite BaP TEC Calculations
Verification Data - WSA1

West Sample Area 1			
300-288:2 Subsite Toxic Equivalent Concentrations of Benzo(a)pyrene. [a]			
Carcinogenic Polyaromatic Hydrocarbons	**Statistical Result (mg/kg)** [b]	**Toxic Equivalency Factor (Unitless)**	**Toxic Equivalent BaP Concentration (mg/kg)**
Benzo[a]pyrene	0.049	1	0.0490
Benzo[a]anthracene	0.072	0.1	0.00720
Benzo[b]fluoranthene	0.076	0.1	0.0076
Chrysene	0.070	0.01	0.00070
Dibenz[a,h]anthracene	0.15	0.1	0.01500
Indeno[1,2,3-cd]pyrene	0.18	0.1	0.01800
Total Toxic Equivalent Concentration of Benzo(a)pyrene			0.098

[a] From WAC 173-340-708(8)(e), Table 708-2 (Ecology 2007).

Attachment 1. 300-288:2 Subsite Verification Sample Results
Notes and Acronyms

Acronyms and notes apply to all of the tables in this attachment.
Gray cells indicate not applicable.

Note: Qualified data are considered acceptable values.

*	=	Duplicate analysis not within the control limits.
B	=	Estimated result. Result is less than the RL, but greater than MDL (metals).
C	=	The analyte was detected in both the sample and the associated QC blank, and the concentration was </= 5x the blank concentration.
D	=	Analyte was reported from a dilution.
J	=	The result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M	=	Duplicate precision not met.
N	=	Recovery exceeds upper or lower control limits.
Q	=	qualifier
U	=	Analyzed for but not detected
X	=	Serial dilution in the analytical batch indicates that physical and chemical interferences are present.

AEA	=	alpha energy analysis
ESA1	=	east sample area 1
ESA2	=	east sample area 2
FS	=	focused sample
GEA	=	gamma energy analysis
HEIS	=	Hanford Environmental Information System
PCB	=	polychlorinated biphenyls
PQL	=	practical quantitation limit
SVOA	=	semivolatile organic analysis
TPH	=	total petroleum hydrocarbons
WSA1	=	west sample area 1
WSA2	=	west sample area 2

Attachment	1	Sheet No.	1 of 34
Originator	R. J. Nielson RJN	Date	7/27/16
Checked	J. M. Capron JMC	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Americium-241 (GEA)			Antimony-125 (GEA)			Cerium-144 (GEA)			Cesium-134 (GEA)			Cesium-137 (GEA)			Cobalt-60 (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
ESA1-7	J1V8F8	3/2/16	0.0108	U	0.0243	0.00803	U	0.0410	-0.00822	U	0.0717	0.0246	U	0.0260	0.00199	U	0.0184	0.000657	U	0.0213
Duplicate of J1V8F8	J1V8H4	3/2/16	0.00694	U	0.0215	-0.0165	U	0.0376	-0.0291	U	0.0621	0.0209	U	0.0248	-0.00260	U	0.0181	0.00836	U	0.0218
ESA1-1	J1V8F2	3/2/16	-0.00473	U	0.0206	0.0126	U	0.0379	0.0100	U	0.0678	0.0122	U	0.0228	0.00583	U	0.0170	0.0106	U	0.0237
ESA1-2	J1V8F3	3/2/16	-0.00395	U	0.0262	0.0208	U	0.0474	-0.00130	U	0.0774	0.0148	U	0.0265	-0.0037	U	0.0185	-0.00455	U	0.0206
ESA1-3	J1V8F4	3/2/16	-0.0738	U	0.0995	-0.00247	U	0.0599	-0.0783	U	0.131	0.0255	U	0.0303	-0.0139	U	0.0224	0.0125	U	0.0265
ESA1-4	J1V8F5	3/2/16	-0.0509	U	0.130	0.00575	U	0.0420	0.0237	U	0.0960	0.00567	U	0.0223	0.00183	U	0.0187	0.00937	U	0.0220
ESA1-5	J1V8F6	3/2/16	-0.00638	U	0.0230	-0.0205	U	0.0422	-0.0249	U	0.0673	0.0281	U	0.0252	0.000606	U	0.0195	-0.00270	U	0.0233
ESA1-6	J1V8F7	3/2/16	0.00182	U	0.0212	0.0005	U	0.0408	0.0317	U	0.0688	0.0143	U	0.0251	0.00759	U	0.0197	0.0101	U	0.0251
ESA1-8	J1V8F9	3/2/16	-0.00958	U	0.0258	0.0111	U	0.0488	-0.0139	U	0.0827	0.0236	U	0.0289	0.00451	U	0.0218	-0.00499	U	0.0222
ESA1-9	J1V8H0	3/2/16	-0.130	U	0.104	-0.0171	U	0.0638	-0.0422	U	0.147	0.00899	U	0.0294	-0.0103	U	0.0239	0.00567	U	0.0243
ESA1-10	J1V8H1	3/2/16	-0.0787	U	0.127	0.0142	U	0.0454	0.0126	U	0.0972	0.0152	U	0.0239	0.00483	U	0.0198	0.00110	U	0.0207
ESA1-11	J1V8H2	3/2/16	-0.0815	U	0.102	0.00810	U	0.0609	-0.100	U	0.131	0.00437	U	0.0277	-0.00543	U	0.0228	-0.00197	U	0.0254
ESA1-12	J1V8H3	3/2/16	-0.0280	U	0.128	-0.00710	U	0.0418	0.00356	U	0.0925	0.00909	U	0.0223	0.00610	U	0.0193	-0.00754	U	0.0199
FS-1	J1V8H5	3/2/16	0.00855	U	0.0271	-0.00210	U	0.0459	0.0174	U	0.0822	0.0253	U	0.0292	0.00314	U	0.0224	-0.0157	U	0.0217
FS-2	J1V8H6	3/2/16	-0.00897	U	0.101	-0.0194	U	0.0812	0.000268	U	0.153	0.0423	U	0.0450	-0.0145	U	0.0291	-4.21E-05	U	0.0317
FS-3	J1V8H7	3/2/16	0.00387	U	0.0213	-0.0141	U	0.0374	-0.0392	U	0.0637	0.0222	U	0.0243	0.000411	U	0.0179	-0.00264	U	0.0183
FS-4	J1V8H8	3/2/16	0.00328	U	0.0232	0.00637	U	0.0393	0.00133	U	0.0676	0.0238	U	0.0263	-0.00958	U	0.0190	0.000191	U	0.0220
Split of J1V8F8	J1V8K2	3/2/16	-0.019	U	0.14	0.013	U	0.16	-0.027	U	0.37	-0.011	U	0.060	0.049	U	0.080	-0.010	U	0.080
ESA2-3	J1V8J1	3/1/16	-0.00407	U	0.0191	0.0125	U	0.0376	0.00701	U	0.0618	0.00512	U	0.0199	-0.00905	U	0.0161	-0.00368	U	0.0171
Duplicate of J1V8J1	J1V8K1	3/1/16	-0.0354	U	0.123	0.00751	U	0.0426	-0.0139	U	0.0913	0.0173	U	0.0215	-0.0138	U	0.0168	0.00585	U	0.0207
ESA2-1	J1V8H9	3/1/16	0.0105	U	0.126	-0.00209	U	0.0417	0.0233	U	0.0901	0.0248	U	0.0235	0.00265	U	0.0181	-0.00597	U	0.0197
ESA2-2	J1V8J0	3/1/16	-0.0706	U	0.102	0.0182	U	0.0616	-0.0223	U	0.141	0.0148	U	0.0285	-0.00365	U	0.0223	0.00284	U	0.0253
ESA2-4	J1V8J2	3/1/16	-0.00627	U	0.0243	0.0152	U	0.0424	-0.0413	U	0.0761	0.0511	U	0.0255	0.00228	U	0.0194	0.00126	U	0.0214
ESA2-5	J1V8J3	3/1/16	-0.0114	U	0.0908	0.00383	U	0.0701	-0.0182	U	0.134	0.0333	U	0.0413	0.00148	U	0.0309	0.00326	U	0.0307
ESA2-6	J1V8J4	3/1/16	-0.00923	U	0.0224	0.00905	U	0.0400	-0.0123	U	0.0683	0.0165	U	0.0253	0.00611	U	0.0203	0.000702	U	0.0211
ESA2-7	J1V8J5	3/1/16	-0.0650	U	0.115	0.0352	U	0.0432	-0.0189	U	0.0832	0.00690	U	0.0210	0.000460	U	0.0165	-0.00927	U	0.0164
ESA2-8	J1V8J6	3/1/16	-0.0330	U	0.122	-0.00657	U	0.0393	0.0332	U	0.0905	0.0186	U	0.0218	-0.00506	U	0.0166	-0.00113	U	0.0191
ESA2-9	J1V8J7	3/1/16	-0.000797	U	0.0233	-0.0143	U	0.0381	-0.0323	U	0.0701	0.0229	U	0.0243	0.00648	U	0.0209	0.00377	U	0.0231
ESA2-10	J1V8J8	3/1/16	0.00290	U	0.0251	0.0146	U	0.0448	0.00290	U	0.0768	0.0158	U	0.0251	0.00655	U	0.0221	-0.00163	U	0.0205
ESA2-11	J1V8J9	3/1/16	-0.0295	U	0.0893	-0.0152	U	0.0661	0.00936	U	0.141	0.0180	U	0.0366	0.00241	U	0.0307	-0.0101	U	0.0322
ESA-12	J1V8K0	3/1/16	0.00301	U	0.0254	0.00762	U	0.0432	0.00209	U	0.0732	0.0310	U	0.0266	0.00472	U	0.0199	-0.00348	U	0.0214
Split of J1V8J1	J1V8K3	3/1/16	0.028	U	0.14	0.064	U	0.30	0.05	U	0.63	-0.13	U	0.13	0.026	U	0.13	0.0090	U	0.12

Attachment	1	Sheet No.	2 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Europium-152 (GEA)			Europium-154 (GEA)			Europium-155 (GEA)			Lead-212 (GEA)			Lead-214 (GEA)			Potassium-40 (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
ESA1-7	J1V8F8	3/2/16	0.00186	U	0.0406	-0.0281	U	0.0674	0.00824	U	0.0360							10.2		0.202
Duplicate of J1V8F8	J1V8H4	3/2/16	0.00336	U	0.0393	0.0130	U	0.0676	0.00776	U	0.0331							9.51		0.184
ESA1-1	J1V8F2	3/2/16	-0.00190	U	0.0362	-0.00285	U	0.0585	-0.00036	U	0.0317							9.31		0.165
ESA1-2	J1V8F3	3/2/16	0.00149	U	0.0449	-0.0252	U	0.0729	0.0181	U	0.0402							8.98		0.179
ESA1-3	J1V8F4	3/2/16	-0.0129	U	0.0638	-0.0394	U	0.0738	-0.0281	U	0.0714							9.35		0.194
ESA1-4	J1V8F5	3/2/16	-0.0115	U	0.0445	-0.0247	U	0.0674	-0.0143	U	0.0506							9.51		0.177
ESA1-5	J1V8F6	3/2/16	-2.15E-05	U	0.0421	0.0158	U	0.0770	0.0244	U	0.0366							9.53		0.211
ESA1-6	J1V8F7	3/2/16	-0.0132	U	0.0388	-0.0207	U	0.0694	0.0267	U	0.0340							10.2		0.193
ESA1-8	J1V8F9	3/2/16	-0.00448	U	0.0482	0.0202	U	0.0777	0.0328	U	0.0432							9.36		0.214
ESA1-9	J1V8H0	3/2/16	0.0174	U	0.0727	-0.0364	U	0.0851	-0.0405	U	0.0780							9.80		0.190
ESA1-10	J1V8H1	3/2/16	-0.00712	U	0.0466	0.00627	U	0.0654	0.0553	U	0.0603							9.71		0.188
ESA1-11	J1V8H2	3/2/16	-0.00524	U	0.0676	-0.0154	U	0.0810	0.0199	U	0.0718							9.74		0.231
ESA1-12	J1V8H3	3/2/16	0.0247	U	0.0494	0.00529	U	0.0640	0.0306	U	0.0543							9.19		0.156
FS-1	J1V8H5	3/2/16	-0.000447	U	0.0448	-0.0212	U	0.0754	0.0104	U	0.0414							9.81		0.183
FS-2	J1V8H6	3/2/16	-0.0232	U	0.0885	-0.0475	U	0.103	0.0057	U	0.0774							10.6		0.306
FS-3	J1V8H7	3/2/16	-0.00777	U	0.0359	-0.0173	U	0.0624	0.0262	U	0.0348							9.42		0.167
FS-4	J1V8H8	3/2/16	-0.00687	U	0.0408	-0.00400	U	0.0686	0.0207	U	0.0356							9.94		0.197
Split of J1V8F8	J1V8K2	3/2/16	-0.037	U	0.20	-0.059	U	0.10	-0.0060	U	0.16	0.72		0.16	0.523		0.19	12.4		0.88
ESA2-3	J1V8J1	3/1/16	-0.00827	U	0.0355	0.0136	U	0.0591	0.0167	U	0.0320							9.42		0.182
Duplicate of J1V8J1	J1V8K1	3/1/16	-0.00348	U	0.0444	0.00937	U	0.0614	0.0391	U	0.0542							9.71		0.176
ESA2-1	J1V8H9	3/1/16	-0.00414	U	0.0442	0.0176	U	0.0652	0.0254	U	0.0526							9.19		0.170
ESA2-2	J1V8J0	3/1/16	-0.0278	U	0.0656	0.0149	U	0.0793	-0.00899	U	0.0739							10.1		0.232
ESA2-4	J1V8J2	3/1/16	-0.0154	U	0.0394	0.0332	U	0.0652	0.0482	U	0.0401							9.79		0.164
ESA2-5	J1V8J3	3/1/16	0.0398	U	0.0819	-0.00974	U	0.113	0.0185	U	0.0721							8.91		0.323
ESA2-6	J1V8J4	3/1/16	-0.0198	U	0.0404	-0.00972	U	0.0713	0.0183	U	0.0354							10.4		0.224
ESA2-7	J1V8J5	3/1/16	-0.00492	U	0.0408	-0.0110	U	0.0587	0.0205	U	0.0509							9.55		0.153
ESA2-8	J1V8J6	3/1/16	-0.00556	U	0.0396	0.0322	U	0.0637	-0.00537	U	0.0479							9.14		0.152
ESA2-9	J1V8J7	3/1/16	-0.00601	U	0.0413	-0.0108	U	0.0679	0.0320	U	0.0379							11.4		0.209
ESA2-10	J1V8J8	3/1/16	0.0180	U	0.0441	-0.00395	U	0.0601	0.0272	U	0.0393							8.80		0.162
ESA2-11	J1V8J9	3/1/16	-0.00819	U	0.0770	-0.0319	U	0.104	0.0264	U	0.0710							9.01		0.253
ESA-12	J1V8K0	3/1/16	-0.0120	U	0.0416	-0.00396	U	0.0734	0.0308	U	0.0388							11.9		0.209
Split of J1V8J1	J1V8K3	3/1/16	-0.154	U	0.30	-0.065	U	0.16	0.27	U	0.27	0.8		0.28	0.764		0.32	13.9		1.06

Attachment	1	Sheet No.	3 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Protactinium-234m			Radium-226 (GEA)			Radium-228 (GEA)			Ruthenium-106			Thallium-208 (GEA)			Thorium-234 (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
ESA1-7	J1V8F8	3/2/16				0.338		0.0362	0.420		0.0772	-0.109	U	0.140						
Duplicate of J1V8F8	J1V8H4	3/2/16				0.284		0.0321	0.557		0.0716	0.0549	U	0.151						
ESA1-1	J1V8F2	3/2/16				0.271		0.0314	0.504		0.0681	0.0492	U	0.150						
ESA1-2	J1V8F3	3/2/16				0.318		0.0327	0.474		0.0795	-0.0639	U	0.157						
ESA1-3	J1V8F4	3/2/16				0.293		0.0429	0.475		0.0864	-0.0470	U	0.199						
ESA1-4	J1V8F5	3/2/16				0.308		0.0315	0.516		0.0683	-0.0189	U	0.139						
ESA1-5	J1V8F6	3/2/16				0.344		0.0333	0.487		0.0752	0.0296	U	0.162						
ESA1-6	J1V8F7	3/2/16				0.247	U	0.0771	0.469		0.0869	-0.0223	U	0.153						
ESA1-8	J1V8F9	3/2/16				0.244		0.0387	0.502		0.0818	-0.00675	U	0.170						
ESA1-9	J1V8H0	3/2/16				0.236		0.0510	0.0559	U	0.0884	0.0261	U	0.229						
ESA1-10	J1V8H1	3/2/16				0.280		0.0314	0.429		0.0727	-0.0188	U	0.156						
ESA1-11	J1V8H2	3/2/16				0.234		0.0517	0.396		0.0906	0.0377	U	0.214						
ESA1-12	J1V8H3	3/2/16				0.280		0.0337	0.435		0.0697	-0.0362	U	0.140						
FS-1	J1V8H5	3/2/16				0.305		0.0357	0.469		0.0783	0.0118	U	0.174						
FS-2	J1V8H6	3/2/16				0.355		0.0605	0.660		0.121	0.00256	U	0.284						
FS-3	J1V8H7	3/2/16				0.288		0.0300	0.399		0.0704	-0.0493	U	0.130						
FS-4	J1V8H8	3/2/16				0.332	U	0.0769	0.564		0.0708	0.0231	U	0.153						
Split of J1V8F8	J1V8K2	3/2/16	0.344	U	8.2	0.579		0.060	0.703		0.41	0.072	U	0.57	0.485		0.18	0.867	U	1.42
ESA2-3	J1V8J1	3/1/16				0.288		0.0293	0.509		0.0642	0.0261	U	0.136						
Duplicate of J1V8J1	J1V8K1	3/1/16				0.284		0.0318	0.465		0.0674	-0.108	U	0.132						
ESA2-1	J1V8H9	3/1/16				0.285		0.0340	0.424		0.0687	-0.0489	U	0.132						
ESA2-2	J1V8J0	3/1/16				0.290		0.0455	0.433		0.0818	-0.119	U	0.178						
ESA2-4	J1V8J2	3/1/16				0.313		0.0321	0.505		0.0724	-0.0329	U	0.142						
ESA2-5	J1V8J3	3/1/16				0.344		0.0588	0.426		0.114	-0.0122	U	0.278						
ESA2-6	J1V8J4	3/1/16				0.273	U	0.0764	0.506		0.0730	-0.0388	U	0.145						
ESA2-7	J1V8J5	3/1/16				0.288		0.0320	0.457		0.0609	-0.0498	U	0.126						
ESA2-8	J1V8J6	3/1/16				0.267		0.0328	0.491		0.0662	-0.0243	U	0.137						
ESA2-9	J1V8J7	3/1/16				0.310		0.0309	0.481		0.0825	0.0242	U	0.152						
ESA2-10	J1V8J8	3/1/16				0.343		0.0330	0.464		0.0731	0.0412	U	0.152						
ESA2-11	J1V8J9	3/1/16				0.221	U	0.107	0.480		0.116	0.00866	U	0.245						
ESA-12	J1V8K0	3/1/16				0.347		0.0327	0.630		0.0790	0.0215	U	0.155						
Split of J1V8J1	J1V8K3	3/1/16	0.407	U	14.48	0.606		0.21	0.548	U	0.64	-0.012	U	1.05	0.703		0.3	-0.024	U	1.36

Attachment	1	Sheet No.	4 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Uranium-234 (AEA)			Uranium-235 (GEA)			Uranium-235 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Zinc-65 (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
ESA1-7	J1V8F8	3/2/16	0.124		0.0572	0.0290	U	0.0749	0.0312	U	0.0528	0.353		0.224	0.344		0.0528	-0.00436	U	0.0430
Duplicate of J1V8F8	J1V8H4	3/2/16	0.275		0.0549	0.0278	U	0.0724	0.00	U	0.0549	0.311		0.200	0.162		0.0549	-0.00228	U	0.0454
ESA1-1	J1V8F2	3/2/16	0.0313	U	0.0530	0.00162	U	0.0688	0.0157	U	0.0530	0.344		0.217	0.0595	U	0.0659	0.00565	U	0.0450
ESA1-2	J1V8F3	3/2/16	0.0986		0.0479	0.0298	U	0.0841	-0.00057	U	0.0479	0.421		0.263	0.127		0.0479	-0.0193	U	0.0499
ESA1-3	J1V8F4	3/2/16	0.182		0.0610	0.00398	U	0.144	0.016	U	0.0564	0.266	U	0.904	0.299		0.0610	-0.0448	U	0.0529
ESA1-4	J1V8F5	3/2/16	0.217		0.0605	0.0400	U	0.0972	0.0312	U	0.0528	0.326	U	1.07	0.140		0.0528	0.00718	U	0.0428
ESA1-5	J1V8F6	3/2/16	0.282		0.0610	0.0186	U	0.0689	0.0167	U	0.0563	0.302		0.226	0.165		0.0645	-0.0116	U	0.0479
ESA1-6	J1V8F7	3/2/16	0.305		0.0589	0.0447	U	0.0758	-0.00112	U	0.0512	0.346		0.204	0.264		0.0567	-0.0124	U	0.0552
ESA1-8	J1V8F9	3/2/16	0.175		0.0653	0.0121	U	0.0904	-0.00129	U	0.0589	0.346		0.270	0.0947		0.0624	-0.0395	U	0.0490
ESA1-9	J1V8H0	3/2/16	0.208		0.0589	-0.0394	U	0.150	0.00	U	0.0545	0.622	U	0.980	0.129		0.0545	-0.0518	U	0.0587
ESA1-10	J1V8H1	3/2/16	0.154		0.0663	0.0309	U	0.0995	0.00	U	0.0533	0.576	U	1.07	0.282		0.0576	-0.00127	U	0.0416
ESA1-11	J1V8H2	3/2/16	0.144		0.0659	0.0924	U	0.144	-0.00164	U	0.0528	0.968	U	0.971	0.161		0.0574	-0.00812	U	0.0553
ESA1-12	J1V8H3	3/2/16	0.238		0.0649	0.0203	U	0.0981	0.0320	U	0.0542	0.359	U	1.06	0.352		0.0542	0.00361	U	0.0427
FS-1	J1V8H5	3/2/16	0.150		0.0554	0.0212	U	0.0853	0.00	U	0.0512	0.450		0.267	0.211		0.0512	0.00921	U	0.0545
FS-2	J1V8H6	3/2/16	0.478		0.0566	0.0539	U	0.162	0.0136	U	0.0599	0.429	U	0.949	0.495		0.0523	-0.0882	U	0.0772
FS-3	J1V8H7	3/2/16	0.116		0.0488	0.0768	U	0.0761	-0.00116	U	0.0528	0.140	U	0.230	0.128		0.0559	0.0126	U	0.0465
FS-4	J1V8H8	3/2/16	0.198		0.0608	0.0231	U	0.0737	0.0166	U	0.0562	0.355		0.227	0.0997		0.0562	-0.0775	U	0.0482
Split of J1V8F8	J1V8K2	3/2/16	0.727		0.080	-0.18	U	0.36	0.096		0.090	0.867	U	1.42	0.646		0.070	0.0010	U	0.15
ESA2-3	J1V8J1	3/1/16	0.413		0.0606	0.0208	UJ	0.0666	-0.00066	U	0.0560	0.435		0.18	0.48		0.0560	0.0114	U	0.0431
Duplicate of J1V8J1	J1V8K1	3/1/16	0.320		0.0542	0.0527	UJ	0.0972	0.00	U	0.0542	0.576	U	1.00	0.561		0.0542	0.0158	U	0.0472
ESA2-1	J1V8H9	3/1/16	0.168		0.0474	0.0115	UJ	0.0937	0.0140	U	0.0474	0.0523	U	0.979	0.0673		0.0590	-0.0185	U	0.0365
ESA2-2	J1V8J0	3/1/16	0.0951		0.0540	0.0370	UJ	0.142	0.0153	U	0.0540	0.447	U	0.917	0.0792		0.0540	-0.0586	U	0.0559
ESA2-4	J1V8J2	3/1/16	0.256		0.0624	0.00747	UJ	0.0811	0.00	U	0.0545	0.256		0.237	0.241		0.0545	-0.00607	U	0.0433
ESA2-5	J1V8J3	3/1/16	0.232		0.0568	0.00287	UJ	0.149	0.0155	U	0.0525	0.0576	U	0.865	0.264		0.0525	-0.0700	U	0.0787
ESA2-6	J1V8J4	3/1/16	0.672		0.0593	-0.0248	UJ	0.0734	0.0141	U	0.0561	0.453		0.238	0.748		0.0621	-0.0632	U	0.0476
ESA2-7	J1V8J5	3/1/16	0.159		0.0532	0.0334	UJ	0.0904	0.00	U	0.0491	0.850	U	0.974	0.145		0.0491	-0.0105	U	0.0426
ESA2-8	J1V8J6	3/1/16	0.283		0.0680	0.0392	UJ	0.0913	-0.00134	U	0.0614	-0.0377	U	0.944	0.283		0.0650	0.00621	U	0.0410
ESA2-9	J1V8J7	3/1/16	0.376		0.0529	0.0230	UJ	0.0772	0.0144	U	0.0573	0.456		0.223	0.203		0.0529	0.00875	U	0.0481
ESA2-10	J1V8J8	3/1/16	0.191		0.0629	0.0410	UJ	0.0832	0.0143	U	0.0505	0.329		0.252	0.223		0.0547	0.00835	U	0.0452
ESA2-11	J1V8J9	3/1/16	0.135		0.0819	-0.0153	UJ	0.146	-0.00192	U	0.0618	0.171	U	0.844	0.236		0.0695	-0.104	U	0.0680
ESA-12	J1V8K0	3/1/16	0.306		0.0641	0.0437	UJ	0.0774	-0.00059	U	0.0498	0.534		0.229	0.146		0.0539	-0.0816	U	0.0506
Split of J1V8J1	J1V8K3	3/1/16	0.739		0.070	0.047	U	0.66	0.059	U	0.070	-0.024	U	1.36	0.564		0.060	0.134	U	0.32

Attachment	1	Sheet No.	5 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Americium-241 (GEA)			Antimony-125 (GEA)			Cerium-144 (GEA)			Cesium-134 (GEA)			Cesium-137 (GEA)			Cobalt-60 (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
WSA1-1	J1V902	6/16/16	-0.0127	U	0.029	0.00250	U	0.0499	0.0126	U	0.089	0.0264	U	0.031	0.000868	U	0.0237	-0.00816	U	0.0263
Duplicate of J1V902	J1V914	6/16/16	-0.0547	U	0.165	0.0162	U	0.0524	0.0281	U	0.123	0.0258	U	0.0290	0.00889	U	0.0237	-0.0126	U	0.0223
WSA1-2	J1V903	6/16/16	0.0102	U	0.198	0.00048	U	0.0620	-0.0289	U	0.135	0.0467	U	0.036	0.0100	U	0.0282	0.00239	U	0.0314
WSA1-3	J1V904	6/16/16	-0.000594	U	0.029	-0.0364	U	0.0397	0.00797	U	0.0848	0.0223	U	0.029	-0.00796	U	0.0209	0.00204	U	0.0243
WSA1-4	J1V905	6/16/16	0.0272	U	0.119	-0.0467	U	0.0839	-0.0550	U	0.175	0.0265	U	0.049	-0.0164	U	0.0394	0.00393	U	0.0458
WSA1-5	J1V906	6/16/16	-0.131	U	0.143	-0.00889	U	0.0728	-0.0192	U	0.199	0.0395	U	0.036	0.0130	U	0.0302	-0.0151	U	0.0265
WSA1-6	J1V907	6/16/16	-0.00445	U	0.037	0.0177	U	0.0582	-0.0595	U	0.103	0.0437	U	0.038	0.00766	U	0.0281	-0.0154	U	0.0269
WSA1-7	J1V908	6/16/16	0.0232	U	0.032	0.0103	U	0.0504	-0.0107	U	0.0883	0.0277	U	0.031	-0.00896	U	0.0240	0.00380	U	0.0291
WSA1-8	J1V909	6/16/16	-0.00766	U	0.034	0.00264	U	0.0505	0.0242	U	0.0969	0.0293	U	0.032	0.00098	U	0.0252	-0.00425	U	0.0265
WSA1-9	J1V910	6/16/16	0.00958	U	0.183	0.00042	U	0.0576	0.0730	U	0.132	0.0249	U	0.034	-0.00128	U	0.0249	-0.0126	U	0.0256
WSA1-10	J1V911	6/16/16	-0.0108	U	0.034	0.0187	U	0.0574	-0.0392	U	0.095	0.0381	U	0.036	0.00752	U	0.0259	0.00103	U	0.0293
WSA1-11	J1V912	6/16/16	-0.0922	U	0.110	0.0237	U	0.0911	0.00812	U	0.179	0.0186	U	0.045	-0.00722	U	0.0382	-0.00359	U	0.0414
WSA1-12	J1V913	6/16/16	-0.0389	U	0.135	0.00509	U	0.0729	-0.0684	U	0.188	0.0276	U	0.035	0.000687	U	0.0296	0.000645	U	0.0287
Split of J1V902	J1V928	6/16/16	-0.047	U	0.090	-0.049	U	0.13	-0.013	U	0.33	-0.001	U	0.06	-0.01	U	0.05	0.03	U	0.06
WSA2-10	J1V924	6/16/16	0.000835	U	0.029	-0.0159	U	0.046	-0.00222	U	0.0849	0.0372	U	0.0290	-0.00615	U	0.0206	0.00887	U	0.0227
Duplicate of J1V924	J1V927	6/16/16	-0.000638	U	0.136	0.0149	U	0.0725	-0.132	U	0.168	0.0223	U	0.034	0.00499	U	0.0279	0.00362	U	0.0269
WSA2-1	J1V915	6/16/16	0.0392	U	0.111	-0.0203	U	0.0837	0.00413	U	0.166	0.0464	U	0.047	-0.0109	U	0.0360	-0.0111	U	0.0372
WSA2-2	J1V916	6/16/16	-0.0797	U	0.125	-0.0318	U	0.0695	-0.174	U	0.167	0.0264	U	0.031	0.0107	U	0.0284	-0.00479	U	0.0248
WSA2-3	J1V917	6/16/16	-0.00113	U	0.025	-0.0147	U	0.0401	-0.0288	U	0.0759	0.0176	U	0.027	-0.00724	U	0.0189	0.00582	U	0.0228
WSA2-4	J1V918	6/16/16	0.00387	U	0.023	-0.0145	U	0.0372	-0.0139	U	0.0676	0.0252	U	0.025	-0.0119	U	0.0160	0.00203	U	0.0198
WSA2-5	J1V919	6/16/16	0.00339	U	0.027	-0.00369	U	0.0439	0.00887	U	0.0782	0.0242	U	0.028	-0.00612	U	0.0211	-0.00144	U	0.0246
WSA2-6	J1V920	6/16/16	0.0119	U	0.027	9.4E-05	U	0.0456	-0.0264	U	0.0753	0.0291	U	0.028	-0.00373	U	0.0218	0.00693	U	0.0246
WSA2-7	J1V921	6/16/16	-0.00251	U	0.157	0.0337	U	0.0547	-0.00288	U	0.108	0.0215	U	0.027	-0.0100	U	0.0194	-0.00379	U	0.0239
WSA2-8	J1V922	6/16/16	0.00143	U	0.09	0.0147	U	0.0786	-0.0228	U	0.144	0.0116	U	0.037	0.00259	U	0.0319	-0.0129	U	0.0266
WSA2-9	J1V923	6/16/16	0.0147	U	0.122	0.0163	U	0.0681	-0.134	U	0.163	0.0216	U	0.032	-0.00208	U	0.0252	-0.000445	U	0.0230
WSA2-11	J1V925	6/16/16	0.00789	U	0.024	-0.00042	U	0.0383	-0.0511	U	0.0721	0.0102	U	0.023	-0.00067	U	0.0189	0.00439	U	0.0224
WSA2-12	J1V926	6/16/16	0.00407	U	0.031	-0.00805	U	0.0477	0.0133	U	0.0945	0.0323	U	0.032	-0.0163	U	0.0208	-0.00671	U	0.0228
Split of J1V924	J1V929	6/16/16	-0.114	U	0.11	0.097	U	0.17	0.001	U	0.32	-0.312	U	0.06	-0.007	U	0.07	0.008	U	0.07

Attachment	1	Sheet No.	6 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Europium-152 (GEA)			Europium-154 (GEA)			Europium-155 (GEA)			Lead-212 (GEA)			Lead-214 (GEA)			Potassium-40 (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
WSA1-1	J1V902	6/16/16	0.00331	U	0.051	0.00308	U	0.0899	0.0371	U	0.0448							13.8		0.263
Duplicate of J1V902	J1V914	6/16/16	0.000829	U	0.059	-0.0310	U	0.0703	0.0345	U	0.0682							13.7		0.196
WSA1-2	J1V903	6/16/16	-0.0407	U	0.0630	-0.0365	U	0.0897	0.0591	U	0.0799							14.5		0.277
WSA1-3	J1V904	6/16/16	-0.00254	U	0.046	-0.00424	U	0.0746	0.0328	U	0.0431							14.5		0.167
WSA1-4	J1V905	6/16/16	-0.0284	U	0.092	0.0422	U	0.139	0.0334	U	0.0950							13.7		0.350
WSA1-5	J1V906	6/16/16	-0.111	U	0.086	-0.0227	U	0.0938	-0.0576	U	0.102							14.2		0.237
WSA1-6	J1V907	6/16/16	0.0124	U	0.0600	0.0135	U	0.0880	0.0394	U	0.0558							14.4		0.272
WSA1-7	J1V908	6/16/16	-0.0453	U	0.046	-0.00192	U	0.0887	0.0342	U	0.0451							13.6		0.286
WSA1-8	J1V909	6/16/16	0.0343	U	0.058	-0.0253	U	0.0822	0.0275	U	0.0494							15.9		0.247
WSA1-9	J1V910	6/16/16	-0.00531	U	0.063	-0.00616	U	0.0928	0.0497	U	0.0761							14.9		0.194
WSA1-10	J1V911	6/16/16	0.0106	U	0.0530	0.0181	U	0.0897	0.0446	U	0.0516							15.5		0.248
WSA1-11	J1V912	6/16/16	0.0296	U	0.100	-0.0370	U	0.131	0.0400	U	0.0928							14.1		0.266
WSA1-12	J1V913	6/16/16	0.00920	U	0.081	-0.0797	U	0.0824	0.0113	U	0.0992							13.8		0.238
Split of J1V902	J1V928	6/16/16	-0.067	U	0.17	-0.06	U	0.09	0.079	U	0.15	0.838		0.18	0.631		0.15	14.869		0.82
WSA2-10	J1V924	6/16/16	-0.00321	U	0.047	0.00924	U	0.0748	0.0377	U	0.0438							11.3		0.222
Duplicate of J1V924	J1V927	6/16/16	0.0332	U	0.075	-0.0705	U	0.0791	0.0143	U	0.0963							12.8		0.176
WSA2-1	J1V915	6/16/16	0.000370	U	0.091	0.0274	U	0.122	0.0413	U	0.0875							10.5		0.291
WSA2-2	J1V916	6/16/16	-0.0751	U	0.074	0.0107	U	0.0882	-0.0308	U	0.0915							9.94		0.222
WSA2-3	J1V917	6/16/16	-0.0135	U	0.042	-0.00741	U	0.0749	0.0390	U	0.0408							10.3		0.190
WSA2-4	J1V918	6/16/16	0.0122	U	0.04	0.0257	U	0.0712	0.0156	U	0.0365							9.18		0.152
WSA2-5	J1V919	6/16/16	-0.0155	U	0.045	-0.00639	U	0.0854	0.0375	U	0.0383							11.7		0.269
WSA2-6	J1V920	6/16/16	-0.0317	U	0.04	-0.0205	U	0.0718	0.0430	U	0.0410							11.2		0.161
WSA2-7	J1V921	6/16/16	0.0289	U	0.057	0.0200	U	0.0788	0.0696	U	0.0693							13.9		0.187
WSA2-8	J1V922	6/16/16	0.0476	U	0.085	0.0653	U	0.114	0.0414	U	0.0761							9.26		0.282
WSA2-9	J1V923	6/16/16	-0.113	U	0.077	-0.00344	U	0.0873	-0.0288	U	0.0877							9.59		0.207
WSA2-11	J1V925	6/16/16	0.0184	U	0.042	-0.00940	U	0.0661	0.0298	U	0.0381							10.4		0.176
WSA2-12	J1V926	6/16/16	-0.0255	U	0.049	-0.00740	U	0.0757	0.0297	U	0.0468							12.4		0.177
Split of J1V924	J1V929	6/16/16	0.04	U	0.15	0.085		0.08	0.03	U	0.13	0.593		0.15	0.488		0.17	11.269		0.79

Attachment	1	Sheet No.	7 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Protactinium-234m			Radium-226 (GEA)			Radium-228 (GEA)			Ruthenium-106			Thallium-208 (GEA)			Thorium-234 (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
WSA1-1	J1V902	6/16/16				0.475		0.0425	0.832		0.0930	-0.0571	U	0.178						
Duplicate of J1V902	J1V914	6/16/16				0.543		0.0411	0.822		0.0747	-0.0346	U	0.168						
WSA1-2	J1V903	6/16/16				0.554		0.0470	0.785		0.0975	-0.0117	U	0.210						
WSA1-3	J1V904	6/16/16				0.485		0.0348	0.854		0.081	-0.0510	U	0.160						
WSA1-4	J1V905	6/16/16				0.572		0.0720	0.793		0.151	-0.133	U	0.301						
WSA1-5	J1V906	6/16/16				0.482		0.0564	0.823		0.110	-0.0416	U	0.252						
WSA1-6	J1V907	6/16/16				0.553		0.0462	0.769		0.103	-0.0965	U	0.204						
WSA1-7	J1V908	6/16/16				0.519		0.0420	0.775		0.0964	-0.0266	U	0.179						
WSA1-8	J1V909	6/16/16				0.568		0.0426	0.859		0.0846	-0.00445	U	0.198						
WSA1-9	J1V910	6/16/16				0.544		0.0442	0.991		0.0958	0.0248	U	0.200						
WSA1-10	J1V911	6/16/16				0.588		0.0447	0.852		0.105	-0.00460	U	0.187						
WSA1-11	J1V912	6/16/16				0.682		0.0659	0.992		0.134	0.0328	U	0.326						
WSA1-12	J1V913	6/16/16				0.555		0.0579	0.759		0.109	0.0309	U	0.238						
Split of J1V902	J1V928	6/16/16	2.104	U	7.07	0.566		0.14	0.844		0.23	0.099	U	0.54	0.657		0.09	1.007	U	1.87
WSA2-10	J1V924	6/16/16				0.392		0.0382	0.645		0.0749	0.0924	U	0.184						
Duplicate of J1V924	J1V927	6/16/16				0.426		0.0519	0.733		0.102	0.0425	U	0.228						
WSA2-1	J1V915	6/16/16				0.446		0.0656	0.657	U	0.273	-0.0304	U	0.288						
WSA2-2	J1V916	6/16/16				0.390		0.0493	0.312		0.0886	0.0369	U	0.225						
WSA2-3	J1V917	6/16/16				0.312		0.0339	0.577		0.0681	0.0352	U	0.158						
WSA2-4	J1V918	6/16/16				0.362		0.0301	0.481		0.0684	0.0206	U	0.154						
WSA2-5	J1V919	6/16/16				0.362		0.0368	0.429		0.0913	0.0575	U	0.178						
WSA2-6	J1V920	6/16/16				0.346		0.0356	0.519		0.0785	-0.0418	U	0.157						
WSA2-7	J1V921	6/16/16				0.357		0.0399	0.661		0.0801	0.00643	U	0.176						
WSA2-8	J1V922	6/16/16				0.307	U	0.111	0.594		0.119	0.0260	U	0.254						
WSA2-9	J1V923	6/16/16				0.356	U	0.0914	0.175		0.0998	-0.0067	U	0.215						
WSA2-11	J1V925	6/16/16				0.323		0.0327	0.581		0.0761	0.0295	U	0.157						
WSA2-12	J1V926	6/16/16				0.397		0.0391	0.700		0.0879	0.0198	U	0.182						
Split of J1V924	J1V929	6/16/16	-3.004	U	5.97	0.597		0.17	0.609		0.3	0.434	U	0.59	0.447		0.16	0.405	U	1.12

Attachment	1	Sheet No.	8 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Radionuclides).

Sample Location	HEIS Number	Sample Date	Uranium-234 (AEA)			Uranium-235 (GEA)			Uranium-235 (AEA)			Uranium-238 (GEA)			Uranium-238 (AEA)			Zinc-65 (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
WSA1-1	J1V902	6/16/16	0.283		0.054	0.0465	U	0.0937	-0.00249	U	0.0524	0.770		0.293	0.486		0.106	0.00545	U	0.0559
Duplicate of J1V902	J1V914	6/16/16	0.171		0.098	0.0491	U	0.123	0.00548	U	0.0861	0.0601	U	1.32	0.221	U	0.240	0.0281	U	0.0531
WSA1-2	J1V903	6/16/16	0.244		0.101	0.0483	U	0.141	0.0260	U	0.0573	0.513	U	1.46	0.240		0.106	-0.0387	U	0.0578
WSA1-3	J1V904	6/16/16	0.245		0.064	0.0562	U	0.0929	0.0385	U	0.0482	0.360		0.281	0.333		0.0732	0.00601	U	0.0471
WSA1-4	J1V905	6/16/16	0.144		0.102	-0.0449	U	0.184	-0.0104	U	0.0878	0.436	U	1.11	0.190	U	0.228	-0.0176	U	0.0889
WSA1-5	J1V906	6/16/16	0.274		0.126	0.0595	U	0.198	0.0169	U	0.110	1.28	U	1.30	0.385		0.315	0.0119	U	0.0718
WSA1-6	J1V907	6/16/16	0.431		0.051	0.00418	U	0.110	0.0105	U	0.0418	0.588		0.361	0.235		0.0576	0.00507	U	0.0587
WSA1-7	J1V908	6/16/16	0.164		0.067	-0.0192	U	0.0954	-0.0022	U	0.0711	0.544		0.292	0.198		0.0773	-0.0441	U	0.0604
WSA1-8	J1V909	6/16/16	0.295		0.061	0.0758	U	0.105	0.00900	U	0.0561	0.707		0.324	0.224		0.108	-0.00751	U	0.0584
WSA1-9	J1V910	6/16/16	0.240		0.057	0.0138	U	0.135	0.00913	U	0.0363	0.579	U	1.49	0.232		0.0701	0.00139	U	0.0593
WSA1-10	J1V911	6/16/16	0.251		0.07	0.0558	U	0.103	0.0185	U	0.0508	0.711		0.322	0.109		0.0683	0.00502	U	0.0568
WSA1-11	J1V912	6/16/16	0.240		0.059	0.00278	U	0.181	0.0230	U	0.0474	0.280	U	1.10	0.188		0.0661	-0.0576	U	0.0898
WSA1-12	J1V913	6/16/16	0.194		0.088	-0.0534	U	0.185	0.0170	U	0.0737	0.0543	U	1.18	0.224		0.197	0.000347	U	0.0676
Split of J1V902	J1V928	6/16/16	0.719		0.13	0.128	U	0.36	0.106	U	0.17	1.01	U	1.87	0.485		0.15	-0.018	U	0.13
WSA2-10	J1V924	6/16/16	0.193		0.062	0.0494	U	0.0916	-0.00053	U	0.0445	0.419		0.285	0.155		0.0572	0.0297	U	0.0562
Duplicate of J1V924	J1V927	6/16/16	0.199		0.056	0.0692	U	0.179	0.00	U	0.0521	0.564	U	1.19	0.277		0.0521	0.0271	U	0.0643
WSA2-1	J1V915	6/16/16	0.221		0.058	-0.00477	U	0.169	0.0171	U	0.0577	0.884	U	1.04	0.204		0.0577	-0.0707	U	0.0860
WSA2-2	J1V916	6/16/16	0.640		0.052	0.0311	U	0.178	0.0153	U	0.0516	0.127	U	1.08	0.701		0.0516	-0.0624	U	0.0628
WSA2-3	J1V917	6/16/16	0.168		0.047	0.0149	U	0.0798	0.0119	U	0.0472	0.258		0.247	0.207		0.0436	0.0334	U	0.0534
WSA2-4	J1V918	6/16/16	0.179		0.067	0.0138	U	0.0724	0.0152	U	0.0604	0.385		0.218	0.161		0.0741	0.00791	U	0.0431
WSA2-5	J1V919	6/16/16	0.337		0.069	-0.0359	U	0.0812	0.0140	U	0.0688	0.480		0.259	0.402		0.0688	-0.00405	U	0.0564
WSA2-6	J1V920	6/16/16	0.208		0.079	0.0474	U	0.0835	0.00	U	0.0786	0.405		0.257	0.289		0.0786	-0.0808	U	0.0488
WSA2-7	J1V921	6/16/16	0.111		0.054	0.00243	U	0.113	0.0153	U	0.0539	-0.0294	U	1.16	0.111		0.0539	0.0434	U	0.0593
WSA2-8	J1V922	6/16/16	0.409		0.065	-0.0131	U	0.153	-0.00143	U	0.0654	0.546	U	0.879	0.196		0.0604	-0.0559	U	0.0767
WSA2-9	J1V923	6/16/16	0.278		0.059	0.0248	U	0.170	0.00	U	0.0587	0.773	U	1.07	0.346		0.0587	-0.0297	U	0.0704
WSA2-11	J1V925	6/16/16	0.531		0.082	0.00542	U	0.0765	-0.00097	U	0.0818	0.329		0.248	0.241		0.0818	-0.00499	U	0.0426
WSA2-12	J1V926	6/16/16	0.350		0.057	0.0313	U	0.095	0.00	U	0.0496	0.575		0.307	0.394		0.0568	-0.0277	U	0.0497
Split of J1V924	J1V929	6/16/16	0.673		0.06	0.144	U	0.34	0.099		0.1	0.405	U	1.12	0.45		0.06	0.007	U	0.14

Attachment	1	Sheet No.	9 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	2300	X	1.4	0.33	U	0.33	0.58	U	0.58	27.2	X	0.067	0.097	B	0.029	0.86	U	0.86
Duplicate of J1V8F8	J1V8H4	3/2/16	4340	X	1.5	0.38	U	0.38	1.1		0.65	54.5	X	0.075	0.18	B	0.033	0.97	U	0.97
ESA1-1	J1V8F2	3/2/16	2370	X	1.1	0.28	U	0.28	0.56	BN	0.48	32.8	XMN	0.055	0.11	BMN	0.024	0.71	UN	0.71
ESA1-2	J1V8F3	3/2/16	2670	X	1.5	0.36	U	0.36	0.75	B	0.63	37.0	X	0.072	0.11	B	0.031	0.93	U	0.93
ESA1-3	J1V8F4	3/2/16	1930	X	1.6	0.39	U	0.39	1.0		0.67	24.5	X	0.077	0.086	B	0.033	0.99	U	0.99
ESA1-4	J1V8F5	3/2/16	2020	X	1.5	0.36	U	0.36	0.72	B	0.63	19.5	X	0.073	0.070	B	0.032	0.94	U	0.94
ESA1-5	J1V8F6	3/2/16	3530	X	1.5	0.37	U	0.37	1.1		0.64	38.6	X	0.073	0.14	B	0.032	0.95	U	0.95
ESA1-6	J1V8F7	3/2/16	3210	X	1.3	0.33	U	0.33	0.79	B	0.57	44.3	X	0.065	0.13	B	0.028	0.84	U	0.84
ESA1-8	J1V8F9	3/2/16	1810	X	1.4	0.33	U	0.33	0.58	U	0.58	27.4	X	0.066	0.071	B	0.029	0.85	U	0.85
ESA1-9	J1V8H0	3/2/16	2380	X	1.3	0.32	U	0.32	0.93		0.55	31.8	X	0.063	0.11	B	0.027	0.81	U	0.81
ESA1-10	J1V8H1	3/2/16	2170	X	1.2	0.29	U	0.29	0.50	U	0.50	30.5	X	0.057	0.10	B	0.025	0.74	U	0.74
ESA1-11	J1V8H2	3/2/16	2710	X	1.4	0.35	U	0.35	0.66	B	0.61	37.8	X	0.071	0.10	B	0.031	0.91	U	0.91
ESA1-12	J1V8H3	3/2/16	1940	X	1.1	0.27	U	0.27	0.47	U	0.47	24.4	X	0.054	0.093	B	0.024	0.70	U	0.70
FS-1	J1V8H5	3/2/16	3950	X	1.3	0.32	U	0.32	1.2		0.56	53.8	X	0.065	0.15	B	0.028	0.83	U	0.83
FS-2	J1V8H6	3/2/16	3120	X	1.4	0.36	U	0.36	0.62	U	0.62	39.1	X	0.071	0.13	B	0.031	0.92	U	0.92
FS-3	J1V8H7	3/2/16	2720	X	1.6	0.39	U	0.39	0.68	U	0.68	40.0	X	0.078	0.11	B	0.034	1.0	U	1.0
FS-4	J1V8H8	3/2/16	3870	X	1.4	0.33	U	0.33	0.75	B	0.58	51.3	X	0.067	0.17	B	0.029	0.86	U	0.86
Split of J1V8F8	J1V8K2	3/2/16	3840		6.92	3.36	DU	3.36	3.4		0.509	54.4		0.102	1.26		0.102	12.6		1.02
Equipment blank	J1V8F1	3/2/16	150	X	1.3	0.32	U	0.32	0.57	B	0.55	1.5	X	0.063	0.036	B	0.027	0.81	U	0.81
ESA2-3	J1V8J1	3/1/16	3030	X	1.5	0.38	UJ	0.38	0.66	U	0.66	40.2	X	0.076	0.10	B	0.033	0.98	U	0.98
Duplicate of J1V8J1	J1V8K1	3/1/16	4210	X	1.5	0.37	UJ	0.37	1.1		0.64	52.7	X	0.074	0.16	B	0.032	0.96	U	0.96
ESA2-1	J1V8H9	3/1/16	3610	X	1.2	0.59	UJ	0.59	0.74	B	0.51	46.1	X	0.059	0.13	B	0.051	0.76	U	0.76
ESA2-2	J1V8J0	3/1/16	4350	X	1.4	0.35	UJ	0.35	1.1		0.61	65.7	X	0.070	0.15	B	0.030	0.9	U	0.90
ESA2-4	J1V8J2	3/1/16	5350	X	1.5	0.37	UJ	0.37	1.2		0.64	68.4	X	0.073	0.20		0.032	0.94	U	0.94
ESA2-5	J1V8J3	3/1/16	4410	X	1.4	0.35	UJ	0.35	1.6		0.61	52.0	X	0.070	0.15	B	0.030	0.91	U	0.91
ESA2-6	J1V8J4	3/1/16	4910	X	1.6	0.39	UJ	0.39	1.2		0.68	67.7	X	0.078	0.17	B	0.034	1.0	U	1.0
ESA2-7	J1V8J5	3/1/16	4610	X	1.4	0.34	UJ	0.34	1.0		0.59	65.6	X	0.068	0.18		0.029	0.87	U	0.87
ESA2-8	J1V8J6	3/1/16	4070	X	1.5	0.37	UJ	0.37	1.3		0.64	63.1	X	0.074	0.17	B	0.032	0.95	U	0.95
ESA2-9	J1V8J7	3/1/16	5310	X	1.6	0.39	UJ	0.39	1.4		0.68	65.7	X	0.079	0.21		0.034	1.0	U	1.0
ESA2-10	J1V8J8	3/1/16	4110	X	1.4	0.35	UJ	0.35	0.66	B	0.60	53.6	X	0.069	0.16	B	0.030	0.89	U	0.89
ESA2-11	J1V8J9	3/1/16	3950	X	1.3	0.32	UJ	0.32	0.56	U	0.56	52.4	X	0.065	0.14	B	0.028	0.83	U	0.83
ESA-12	J1V8K0	3/1/16	5660	X	1.5	0.36	UJ	0.36	1.4		0.63	67.4	X	0.072	0.23		0.031	0.93	U	0.93
Split of J1V8J1	J1V8K3	3/1/16	3060		7.1	3.44	DU	3.44	3.44		0.522	46.5		0.104	1.26		0.104	11.6		1.04

Attachment	1	Sheet No.	10 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Iron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	0.061	B	0.036	2570	X	12.4	3.6	X	0.051	3.6	X	0.088	5.6		0.19	11000	X	3.3
Duplicate of J1V8F8	J1V8H4	3/2/16	0.10	B	0.041	5050	X	14.0	5.9	X	0.057	7.0	X	0.099	12.2		0.22	21200	X	3.8
ESA1-1	J1V8F2	3/2/16	0.056	B	0.030	3230	XM	10.2	3.1	XN	0.042	4.6	XMN	0.073	7.3		0.16	14200	X	2.8
ESA1-2	J1V8F3	3/2/16	0.072	B	0.039	3550	X	13.4	4.2	X	0.055	5.8	X	0.095	8.7		0.21	17300	X	3.6
ESA1-3	J1V8F4	3/2/16	0.048	B	0.042	2680	X	14.3	2.3	X	0.059	3.8	X	0.10	6		0.22	11300	X	3.9
ESA1-4	J1V8F5	3/2/16	0.062	B	0.039	2510	X	13.5	2.9	X	0.056	3.4	X	0.096	5.6		0.21	9910	X	3.6
ESA1-5	J1V8F6	3/2/16	0.089	B	0.040	4460	X	13.6	3.9	X	0.056	5.7	X	0.097	9.5		0.21	18800	X	3.7
ESA1-6	J1V8F7	3/2/16	0.084	B	0.035	3880	X	12.1	4.3	X	0.050	5.5	X	0.086	8.8		0.19	16400	X	3.3
ESA1-8	J1V8F9	3/2/16	0.054	B	0.036	2160	X	12.3	2.2	X	0.051	3.4	X	0.087	5.1		0.19	10300	X	3.3
ESA1-9	J1V8H0	3/2/16	0.067	B	0.034	3040	X	11.7	3.4	X	0.048	4.4	X	0.083	7.3		0.18	13200	X	3.2
ESA1-10	J1V8H1	3/2/16	0.060	B	0.031	2700	X	10.6	3.1	X	0.044	4.0	X	0.075	6.4		0.16	12600	X	2.9
ESA1-11	J1V8H2	3/2/16	0.071	B	0.038	3140	X	13.1	3.4	X	0.054	4.0	X	0.093	7.0		0.20	13300	X	3.5
ESA1-12	J1V8H3	3/2/16	0.046	B	0.029	2530	X	10.1	2.8	X	0.042	4.1	X	0.072	6.6		0.16	10400	X	2.7
FS-1	J1V8H5	3/2/16	0.089	B	0.035	4560	X	12.0	5.6	X	0.049	5.7	X	0.085	9.7		0.18	18100	X	3.2
FS-2	J1V8H6	3/2/16	0.086	B	0.038	4320	X	13.2	4.2	X	0.054	5.6	X	0.093	9.2		0.20	17100	X	3.6
FS-3	J1V8H7	3/2/16	0.08	B	0.042	3390	X	14.5	2.9	X	0.060	4.5	X	0.10	7.7		0.22	13900	X	3.9
FS-4	J1V8H8	3/2/16	0.11	B	0.036	5500	X	12.4	4.6	X	0.051	6.5	X	0.088	11.1		0.19	20900	X	3.3
Split of J1V8F8	J1V8K2	3/2/16	1.02	DU	1.02	5020	M	8.14	5.49		0.153	9.57	D	1.53	13.0		0.305	24300	M	8.14
Equipment blank	J1V8F1	3/2/16	0.034	U	0.034	59.2	CX	11.7	0.18	CX	0.048	0.083	UX	0.083	0.18	U	0.18	447	X	3.2
ESA2-3	J1V8J1	3/1/16	0.11	B	0.041	3720	XJ	14.1	4.1	X	0.058	5.5		0.10	9.1		0.22	17900	X	3.8
Duplicate of J1V8J1	J1V8K1	3/1/16	0.11	B	0.040	4850	XJ	13.8	6.0	X	0.057	7.5		0.098	12.9		0.21	22800	X	3.7
ESA2-1	J1V8H9	3/1/16	0.090	BM	0.032	3670	XMJ	10.9	4.8	X	0.045	5.8	M	0.15	10.9		0.34	17400	X	2.9
ESA2-2	J1V8J0	3/1/16	0.12	B	0.038	5340	XJ	13.0	7.0	X	0.054	6.7		0.092	13.5		0.20	22000	X	3.5
ESA2-4	J1V8J2	3/1/16	0.13	B	0.040	5730	XJ	13.6	5.7	X	0.056	6.8		0.096	14.9		0.21	22000	X	3.7
ESA2-5	J1V8J3	3/1/16	0.12	B	0.038	5300	XJ	13.0	6.0	X	0.054	7.6		0.092	13.4		0.20	23700	X	3.5
ESA2-6	J1V8J4	3/1/16	0.11	B	0.042	5390	XJ	14.4	6.4	X	0.059	7.4		0.10	13.5		0.22	23700	X	3.9
ESA2-7	J1V8J5	3/1/16	0.11	B	0.036	5350	XJ	12.5	5.8	X	0.052	8.3		0.089	13.1		0.19	22600	X	3.4
ESA2-8	J1V8J6	3/1/16	0.11	B	0.040	5660	XJ	13.6	4.3	X	0.056	8.4		0.097	14.5		0.21	24800	X	3.7
ESA2-9	J1V8J7	3/1/16	0.12	B	0.042	5090	XJ	14.6	8.9	X	0.060	6.6		0.10	13.1		0.22	21900	X	3.9
ESA2-10	J1V8J8	3/1/16	0.12	B	0.037	6720	XJ	12.8	6.2	X	0.053	7.6		0.091	13.0		0.20	23500	X	3.5
ESA2-11	J1V8J9	3/1/16	0.11	B	0.035	5020	XJ	12.0	6.0	X	0.049	7.2		0.085	13.4		0.18	23400	X	3.2
ESA-12	J1V8K0	3/1/16	0.11	B	0.039	5200	XJ	13.4	6.3	X	0.055	8.4		0.095	14.3		0.21	23600	X	3.6
Split of J1V8J1	J1V8K3	3/1/16	1.04	DU	1.04	4460	M	8.35	4.26		0.157	8.91	D	1.57	13.2		0.313	24100	M	8.35

Attachment	1	Sheet No.	11 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Lead			Lithium			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
ESA1-7	J1V8F8	3/2/16	1.0		0.24	2.2		0.80	2130	X	3.2	141	X	0.088	0.011	B	0.0061	0.23	U	0.23
Duplicate of J1V8F8	J1V8H4	3/2/16	2.0		0.27	4.3		0.90	3970	X	3.7	275	X	0.099	0.013	B	0.0060	0.26	U	0.26
ESA1-1	J1V8F2	3/2/16	1.2	N	0.20	2.3	MN	0.66	2420	XMN	2.7	174	X	0.073	0.021	NM	0.0061	0.20	BN	0.19
ESA1-2	J1V8F3	3/2/16	1.2		0.26	2.6		0.86	3230	X	3.5	211	X	0.095	0.015	B	0.0058	0.25	U	0.25
ESA1-3	J1V8F4	3/2/16	0.99		0.27	2.0	B	0.92	1970	X	3.8	133	X	0.10	0.015	B	0.0058	0.26	U	0.26
ESA1-4	J1V8F5	3/2/16	1.1		0.26	2.0	B	0.87	1860	X	3.5	126	X	0.096	0.016	B	0.0059	0.25	U	0.25
ESA1-5	J1V8F6	3/2/16	1.6		0.26	3.1		0.88	3370	X	3.6	220	X	0.097	0.011	B	0.0057	0.25	U	0.25
ESA1-6	J1V8F7	3/2/16	1.5		0.23	3.1		0.78	2920	X	3.2	219	X	0.086	0.011	B	0.0059	0.22	U	0.22
ESA1-8	J1V8F9	3/2/16	1.6		0.24	1.6	B	0.79	1730	X	3.2	126	X	0.087	0.010	B	0.0062	0.23	U	0.23
ESA1-9	J1V8H0	3/2/16	1.1		0.22	2.1		0.76	2270	X	3.1	155	X	0.083	0.0092	B	0.0059	0.22	U	0.22
ESA1-10	J1V8H1	3/2/16	0.94		0.20	1.8	B	0.68	2130	X	2.8	142	X	0.075	0.0098	B	0.0058	0.20	U	0.20
ESA1-11	J1V8H2	3/2/16	1.1		0.25	2.7		0.85	2450	X	3.4	176	X	0.093	0.0095	B	0.0062	0.24	U	0.24
ESA1-12	J1V8H3	3/2/16	0.73		0.19	1.4	B	0.65	2040	X	2.6	121	X	0.072	0.0098	B	0.0068	0.19	U	0.19
FS-1	J1V8H5	3/2/16	1.8		0.23	3.5		0.77	3340	X	3.1	229	X	0.085	0.012	B	0.0059	0.22	U	0.22
FS-2	J1V8H6	3/2/16	1.5		0.25	2.8		0.85	3010	X	3.5	205	X	0.093	0.012	B	0.0064	0.24	U	0.24
FS-3	J1V8H7	3/2/16	1.3		0.28	2.3	B	0.94	2440	X	3.8	166	X	0.10	0.0090	B	0.0059	0.27	U	0.27
FS-4	J1V8H8	3/2/16	1.8		0.24	3.4		0.80	3440	X	3.3	260	X	0.088	0.0085	B	0.0059	0.23	U	0.23
Split of J1V8F8	J1V8K2	3/2/16	3.73	C	0.336	4.64	D	0.414	4330		8.65	286	M	0.203	0.0042	U	0.0042	0.402	B	0.203
Equipment blank	J1V8F1	3/2/16	0.30	B	0.22	0.76	U	0.76	21.9	X	3.1	4.0	X	0.083	0.0058	U	0.0058	0.27	B	0.22
ESA2-3	J1V8J1	3/1/16	1.5		0.27	2.5		0.91	3010		3.7	210	X	0.10	0.023		0.0060	0.26	U	0.26
Duplicate of J1V8J1	J1V8K1	3/1/16	2.2		0.26	3.8		0.89	4130		3.6	278	X	0.098	0.019		0.0059	0.26	B	0.25
ESA2-1	J1V8H9	3/1/16	1.7		0.42	4.1		0.70	3430		5.7	215	X	0.077	0.030	M	0.0067	0.44	BM	0.20
ESA2-2	J1V8J0	3/1/16	1.6		0.25	4.2		0.84	4230		3.4	276	X	0.092	0.022		0.0059	0.51	B	0.24
ESA2-4	J1V8J2	3/1/16	3.0		0.26	4.4		0.88	3690		3.6	289	X	0.096	0.016	B	0.0069	0.28	B	0.25
ESA2-5	J1V8J3	3/1/16	1.7		0.25	3.7		0.84	4510		3.4	288	X	0.092	0.015	B	0.0060	0.30	B	0.24
ESA2-6	J1V8J4	3/1/16	2.4		0.28	4.4		0.93	4210		3.8	299	X	0.10	0.037		0.0060	0.43	B	0.27
ESA2-7	J1V8J5	3/1/16	2.1		0.24	4.1		0.81	4080		3.3	321	X	0.089	0.020		0.0065	0.23	B	0.23
ESA2-8	J1V8J6	3/1/16	2.0		0.26	3.5		0.88	4400		3.6	329	X	0.097	0.017	B	0.0059	0.27	B	0.25
ESA2-9	J1V8J7	3/1/16	2.3		0.28	4.8		0.94	4230		3.8	282	X	0.10	0.019		0.0060	0.27	U	0.27
ESA2-10	J1V8J8	3/1/16	1.7		0.25	3.6		0.83	4360		3.4	287	X	0.091	0.014	B	0.0065	0.24	B	0.24
ESA2-11	J1V8J9	3/1/16	1.9		0.23	3.5		0.77	3980		3.1	281	X	0.085	0.012	B	0.0060	0.26	B	0.22
ESA-12	J1V8K0	3/1/16	3.0		0.26	5.2		0.86	4250		3.5	310	X	0.095	0.013	B	0.0069	0.33	B	0.25
Split of J1V8J1	J1V8K3	3/1/16	3.68	C	0.344	3.21	D	0.407	3750		8.87	274	M	0.209	0.0041	U	0.0041	0.399	B	0.209

Attachment	1	Sheet No.	12 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	5.6	X	0.11	313		36.0	0.76	U	0.76	259	N	5.0	0.14	U	0.14	171		51.8
Duplicate of J1V8F8	J1V8H4	3/2/16	8.8	X	0.12	572		40.6	0.85	U	0.85	228	N	5.6	0.16	U	0.16	332		58.5
ESA1-1	J1V8F2	3/2/16	6.1	XMN	0.089	300	N	29.8	0.62	UN	0.62	148	N	4.1	0.12	UN	0.12	140	N	42.9
ESA1-2	J1V8F3	3/2/16	8.2	X	0.12	289		38.8	0.81	U	0.81	158	N	5.4	0.15	U	0.15	173		55.9
ESA1-3	J1V8F4	3/2/16	4.2	X	0.12	254	B	41.6	0.87	U	0.87	148	N	5.7	0.16	U	0.16	159		59.8
ESA1-4	J1V8F5	3/2/16	5.5	X	0.12	222	B	39.3	0.82	U	0.82	136	N	5.4	0.15	U	0.15	98.8	B	56.6
ESA1-5	J1V8F6	3/2/16	7.7	X	0.12	404		39.7	0.83	U	0.83	178	N	5.5	0.15	U	0.15	217		57.1
ESA1-6	J1V8F7	3/2/16	7.0	X	0.11	411		35.1	0.74	U	0.74	161	N	4.9	0.14	U	0.14	172		50.6
ESA1-8	J1V8F9	3/2/16	3.9	X	0.11	215	B	35.7	0.75	U	0.75	163	N	4.9	0.14	U	0.14	122		51.4
ESA1-9	J1V8H0	3/2/16	5.8	X	0.10	313		34.1	0.71	U	0.71	141	N	4.7	0.13	U	0.13	149		49.1
ESA1-10	J1V8H1	3/2/16	5.6	X	0.092	253		30.8	0.65	U	0.65	149	N	4.3	0.12	U	0.12	136		44.3
ESA1-11	J1V8H2	3/2/16	6.1	X	0.11	361		38.2	0.80	U	0.80	169	N	5.3	0.15	U	0.15	164		54.9
ESA1-12	J1V8H3	3/2/16	5.9	X	0.088	188	B	29.3	0.62	U	0.62	120	N	4.1	0.11	U	0.11	149		42.2
FS-1	J1V8H5	3/2/16	7.9	X	0.10	490		34.8	0.73	U	0.73	204	N	4.8	0.14	U	0.14	180		50.1
FS-2	J1V8H6	3/2/16	6.8	X	0.11	367		38.3	0.80	U	0.80	185	N	5.3	0.15	U	0.15	173		55.1
FS-3	J1V8H7	3/2/16	5.6	X	0.13	250	B	42.2	0.88	U	0.88	139	N	5.8	0.16	U	0.16	177		60.7
FS-4	J1V8H8	3/2/16	7.7	X	0.11	507		36.1	0.76	U	0.76	141	N	5.0	0.14	U	0.14	198		52.0
Split of J1V8F8	J1V8K2	3/2/16	8.32		0.153	615		6.51	0.512	BD	0.342	428	N	1.53	0.687		0.102	272		7.12
Equipment blank	J1V8F1	3/2/16	0.17	BX	0.10	48.5	B	34.1	0.71	U	0.71	109	N	4.7	0.13	U	0.13	49	U	49.0
ESA2-3	J1V8J1	3/1/16	6.0	X	0.12	405		41.0	0.86	U	0.86	129	J	5.7	0.16	U	0.16	207		59.0
Duplicate of J1V8J1	J1V8K1	3/1/16	9.1	X	0.12	586		40.0	0.84	U	0.84	197	J	5.5	0.16	U	0.16	283		57.6
ESA2-1	J1V8H9	3/1/16	6.6	X	0.095	575		31.7	0.66	U	0.66	135	J	4.4	0.12	U	0.12	201	M	45.6
ESA2-2	J1V8J0	3/1/16	10.8	X	0.11	480		37.8	0.79	U	0.79	160	J	5.2	0.15	U	0.15	240		54.4
ESA2-4	J1V8J2	3/1/16	8.0	X	0.12	730		39.5	0.83	U	0.83	180	J	5.5	0.15	U	0.15	286		56.8
ESA2-5	J1V8J3	3/1/16	11.8	X	0.11	462		37.9	0.79	U	0.79	135	J	5.2	0.15	U	0.15	270		54.5
ESA2-6	J1V8J4	3/1/16	9.7	X	0.13	666		42.0	0.88	U	0.88	194	J	5.8	0.16	U	0.16	264		60.4
ESA2-7	J1V8J5	3/1/16	10.6	X	0.11	632		36.5	0.77	U	0.77	186	J	5.0	0.14	U	0.14	328		52.5
ESA2-8	J1V8J6	3/1/16	8.9	X	0.12	522		39.7	0.83	U	0.83	171	J	5.5	0.15	U	0.15	269		57.1
ESA2-9	J1V8J7	3/1/16	9.7	X	0.13	778		42.4	0.89	U	0.89	194	J	5.9	0.17	U	0.17	276		61.0
ESA2-10	J1V8J8	3/1/16	10.8	X	0.11	470		37.3	0.78	U	0.78	157	J	5.2	0.15	U	0.15	289		53.7
ESA2-11	J1V8J9	3/1/16	8.6	X	0.10	569		34.9	0.73	U	0.73	138	J	4.8	0.14	U	0.14	315		50.2
ESA-12	J1V8K0	3/1/16	9.6	X	0.12	906		38.9	0.82	U	0.82	192	J	5.4	0.15	U	0.15	275		56.0
Split of J1V8J1	J1V8K3	3/1/16	7.48		0.157	514		6.68	0.635	BD	0.336	424	N	1.57	0.67		0.104	198		7.31

Attachment	1	Sheet No.	13 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Strontium			Tin			Uranium			Vanadium			Zinc			Zirconium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
ESA1-7	J1V8F8	3/2/16	10.4	X	0.032	0.80	U	0.80	0.35		0.0013	32.8	X	0.083	20.6	X	0.35	10.5	X	0.31
Duplicate of J1V8F8	J1V8H4	3/2/16	19.7	X	0.036	0.90	U	0.90	0.35		0.0013	64.1	X	0.093	38.6	X	0.39	19.9	X	0.35
ESA1-1	J1V8F2	3/2/16	11.8	XMN	0.026	0.66	UN	0.66	0.24	M	0.0014	41.5	XM	0.068	25.9	XN	0.29	13.4	XMN	0.26
ESA1-2	J1V8F3	3/2/16	12.3	X	0.034	0.86	U	0.86	0.35		0.0014	56.8	X	0.089	31.9	X	0.38	15.7	X	0.34
ESA1-3	J1V8F4	3/2/16	9.5	X	0.036	0.92	U	0.92	0.32		0.0012	36.0	X	0.095	21.7	X	0.40	11.4	X	0.36
ESA1-4	J1V8F5	3/2/16	8.9	X	0.035	0.87	U	0.87	0.34		0.0013	30.4	X	0.090	19.1	X	0.38	9.1	X	0.34
ESA1-5	J1V8F6	3/2/16	15.8	X	0.035	0.88	U	0.88	0.34		0.0015	57.1	X	0.091	34.2	X	0.38	18.3	X	0.34
ESA1-6	J1V8F7	3/2/16	14.5	X	0.031	0.78	U	0.78	0.47		0.0013	50.2	X	0.081	30.7	X	0.34	16.8	X	0.30
ESA1-8	J1V8F9	3/2/16	8.9	X	0.031	0.79	U	0.79	0.30		0.0014	32.2	X	0.082	18.7	X	0.35	10.0	X	0.31
ESA1-9	J1V8H0	3/2/16	11.0	X	0.030	0.76	U	0.76	0.36		0.0015	41.6	X	0.078	24.3	X	0.33	12.6	X	0.29
ESA1-10	J1V8H1	3/2/16	10.1	X	0.027	0.69	U	0.69	0.39		0.0014	37.4	X	0.071	22.2	X	0.30	12.1	X	0.27
ESA1-11	J1V8H2	3/2/16	15.1	X	0.034	0.85	U	0.85	0.30		0.0015	40.4	X	0.087	25.2	X	0.37	13.7	X	0.33
ESA1-12	J1V8H3	3/2/16	8.8	X	0.026	0.65	U	0.65	0.30		0.0016	32.9	X	0.067	18.4	X	0.28	9.9	X	0.25
FS-1	J1V8H5	3/2/16	20.0	X	0.031	0.78	U	0.78	0.32		0.0014	56.5	X	0.080	34.0	X	0.34	18.3	X	0.30
FS-2	J1V8H6	3/2/16	14.6	X	0.034	0.85	U	0.85	0.29		0.0014	51.9	X	0.088	32.4	X	0.37	16.6	X	0.33
FS-3	J1V8H7	3/2/16	15.1	X	0.037	0.94	U	0.94	0.34		0.0011	41.1	X	0.097	24.9	X	0.41	11.8	X	0.36
FS-4	J1V8H8	3/2/16	18.9	X	0.032	0.80	U	0.80	0.31		0.0014	62.9	X	0.083	37.5	X	0.35	20.7	X	0.31
Split of J1V8F8	J1V8K2	3/2/16	19.5	M	0.102	0.305	U	0.305	0.372	D	0.0137	83.0	DN	1.02	51.1	D	4.07	20.6	D	0.518
Equipment blank	J1V8F1	3/2/16	0.41	BX	0.030	0.76	U	0.76	0.10		0.0013	0.43	BX	0.078	1.2	X	0.33	0.72	BX	0.29
ESA2-3	J1V8J1	3/1/16	13.4	X	0.036	0.91	UJ	0.91	0.39		0.0014	54.1	J	0.094	32.8	XJ	0.40	17.6	XJ	0.35
Duplicate of J1V8J1	J1V8K1	3/1/16	18.4	X	0.035	0.89	UJ	0.89	0.47		0.0014	71.5	J	0.092	41.7	XJ	0.39	23.1	XJ	0.35
ESA2-1	J1V8H9	3/1/16	20.5	X	0.028	1.4	UNJ	1.4	0.32	M	0.0015	57.2	MJ	0.15	38.0	NXJ	0.61	17.3	XMJ	0.27
ESA2-2	J1V8J0	3/1/16	22.1	X	0.033	0.84	UJ	0.84	0.32		0.0014	69.3	J	0.087	39.0	XJ	0.37	21.4	XJ	0.33
ESA2-4	J1V8J2	3/1/16	23.1	X	0.035	0.88	UJ	0.88	0.40		0.0015	66.0	J	0.091	40.2	XJ	0.38	25.5	XJ	0.34
ESA2-5	J1V8J3	3/1/16	19.3	X	0.033	0.84	UJ	0.84	0.35		0.0014	75.9	J	0.087	41.6	XJ	0.37	22.9	XJ	0.33
ESA2-6	J1V8J4	3/1/16	20.4	X	0.037	0.93	UJ	0.93	0.64		0.0016	72.5	J	0.096	43.0	XJ	0.41	24.1	XJ	0.36
ESA2-7	J1V8J5	3/1/16	23.5	X	0.032	0.81	UJ	0.81	0.33		0.0015	66.4	J	0.084	39.0	XJ	0.35	22.5	XJ	0.32
ESA2-8	J1V8J6	3/1/16	18.9	X	0.035	0.88	UJ	0.88	0.35		0.0014	73.6	J	0.091	42.7	XJ	0.39	24.2	XJ	0.34
ESA2-9	J1V8J7	3/1/16	23.7	X	0.037	0.94	UJ	0.94	0.52		0.0015	67.0	J	0.097	40.9	XJ	0.41	22.8	XJ	0.37
ESA2-10	J1V8J8	3/1/16	20.7	X	0.033	0.83	UJ	0.83	0.36		0.0014	74.8	J	0.086	41.0	XJ	0.36	24.1	XJ	0.32
ESA2-11	J1V8J9	3/1/16	17.6	X	0.031	0.78	UJ	0.78	0.32		0.0014	71.0	J	0.080	41.1	XJ	0.34	23.1	XJ	0.30
ESA-12	J1V8K0	3/1/16	21.3	X	0.034	0.87	UJ	0.87	0.39		0.0016	66.9	J	0.089	43.1	XJ	0.38	24.1	XJ	0.34
Split of J1V8J1	J1V8K3	3/1/16	15.5	M	0.104	0.313	U	0.313	0.427	D	0.0134	76.6	DN	1.04	48.1	D	4.18	22.2	D	0.509

Attachment	1	Sheet No.	14 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	8350	X	1.2	0.30	U	0.30	3.4		0.53	74.1	X	0.061	0.14	B	0.13	0.78	UN	0.78
Duplicate of J1V902	J1V914	6/16/16	8430	X	1.4	0.35	U	0.35	3.5		0.61	74.4	X	0.071	0.16	B	0.15	0.91	U	0.91
WSA1-2	J1V903	6/16/16	8320	X	1.4	0.33	B	0.33	3.6		0.58	74.7	X	0.067	0.20	B	0.15	1.4	B	0.86
WSA1-3	J1V904	6/16/16	8220	X	1.6	0.38	U	0.38	3.4		0.66	71.9	X	0.076	0.18	B	0.17	0.98	U	0.98
WSA1-4	J1V905	6/16/16	7400	X	1.4	0.45	B	0.33	2.4		0.58	61.3	X	0.066	0.14	U	0.14	0.86	U	0.86
WSA1-5	J1V906	6/16/16	7360	X	1.2	0.30	U	0.30	3.3		0.52	65.6	X	0.060	0.13	U	0.13	0.77	U	0.77
WSA1-6	J1V907	6/16/16	8170	X	1.2	0.33	B	0.29	3.7		0.50	74.8	X	0.058	0.13	U	0.13	0.74	U	0.74
WSA1-7	J1V908	6/16/16	8090	X	1.1	0.38	B	0.27	4.0		0.47	73.0	X	0.055	0.14	B	0.12	0.70	U	0.70
WSA1-8	J1V909	6/16/16	7380	X	1.2	0.38	B	0.29	3.8		0.50	65.3	X	0.058	0.14	B	0.13	0.75	U	0.75
WSA1-9	J1V910	6/16/16	9470	X	1.5	0.37	U	0.37	2.8		0.65	83.3	X	0.074	0.16	B	0.16	0.96	U	0.96
WSA1-10	J1V911	6/16/16	8270	X	1.3	0.32	U	0.32	3.3		0.55	68.3	X	0.064	0.16	B	0.14	0.82	U	0.82
WSA1-11	J1V912	6/16/16	8380	X	1.4	0.36	U	0.36	3.2		0.62	73.8	X	0.071	0.15	B	0.15	0.92	U	0.92
WSA1-12	J1V913	6/16/16	8090	X	1.3	0.43	B	0.31	3.0		0.54	80.3	X	0.062	0.18	B	0.13	0.80	U	0.80
Split of J1V902	J1V928	6/16/16	6340		6.96	3.38	DU	3.38	3.3	BD	2.56	71.0		0.102	0.694	BD	0.512	4.87	B	1.02
Equipment blank	J1V901	6/16/16	125	X	1.2	0.30	U	0.30	0.52	U	0.52	1.2	X	0.060	0.026	U	0.026	0.78	U	0.78
WSA2-10	J1V924	6/16/16	5840	X	1.3	0.32	B	0.32	2.5		0.56	61.9	X	0.064	0.22		0.028	0.83	U	0.83
Duplicate of J1V924	J1V927	6/16/16	6160	X	1.4	0.60		0.34	3.5		0.59	66.9	X	0.068	0.24		0.029	0.88	U	0.88
WSA2-1	J1V915	6/16/16	3570	X	1.1	0.50		0.28	1.1		0.49	49.1	X	0.056	0.16		0.024	0.73	U	0.73
WSA2-2	J1V916	6/16/16	3940	X	1.4	0.74	M	0.34	2.2		0.59	90.1	X	0.068	0.22		0.029	3.3	N	0.87
WSA2-3	J1V917	6/16/16	4210	X	1.2	0.30	U	0.30	1.6		0.51	46.3	X	0.059	0.14	B	0.026	0.76	U	0.76
WSA2-4	J1V918	6/16/16	3480	X	1.1	0.26	U	0.26	1.2		0.45	54.7	X	0.052	0.15		0.023	3.7		0.67
WSA2-5	J1V919	6/16/16	4790	X	1.4	0.33	U	0.33	2.0		0.58	48.5	X	0.066	0.15	B	0.029	0.86	U	0.86
WSA2-6	J1V920	6/16/16	4490	X	1.1	0.38	B	0.28	2.2		0.49	65.4	X	0.056	0.19		0.024	0.73	U	0.73
WSA2-7	J1V921	6/16/16	4750	X	1.1	0.27	B	0.26	10.4		0.45	48.9	X	0.052	0.18		0.023	0.67	U	0.67
WSA2-8	J1V922	6/16/16	6260	X	1.8	0.62	B	0.43	2.0		0.75	93.2	X	0.086	0.24		0.037	3.2		1.1
WSA2-9	J1V923	6/16/16	4230	X	1.2	0.63		0.28	1.8		0.49	71.5	X	0.057	0.17		0.025	1.6		0.73
WSA2-11	J1V925	6/16/16	3880	X	1.4	0.51	B	0.34	1.6		0.60	37.1	X	0.069	0.11	B	0.030	0.88	U	0.88
WSA2-12	J1V926	6/16/16	5960	X	1.2	0.43	B	0.28	2.9		0.49	71.3	X	0.057	0.22		0.025	1.0	B	0.73
Split of J1V924	J1V929	6/16/16	4800		6.6	1.6	DU	1.6	3.21	BD	2.43	59.0		0.0971	0.778	BD	0.486	5.04		0.971

Attachment	1	Sheet No.	15 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Cadmium			Calcium			Chromium			Cobalt			Copper			Iron		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	0.12	B	0.033	4550	X	11.3	11.2	X	0.046	9.2		0.40	13.3	X	0.17	23900	X	3.0
Duplicate of J1V902	J1V914	6/16/16	0.11	B	0.038	4000	X	13.1	10.1	X	0.054	8.6		0.47	12.9	X	0.20	23600	X	3.5
WSA1-2	J1V903	6/16/16	0.13	B	0.036	4420	X	12.4	9.5	X	0.051	9.3		0.44	12.8	X	0.19	25400	X	3.3
WSA1-3	J1V904	6/16/16	0.12	B	0.041	3740	X	14.2	9.8	X	0.058	8.9		0.50	12.0	X	0.22	24000	X	3.8
WSA1-4	J1V905	6/16/16	0.10	B	0.036	4160	X	12.3	8.4	X	0.051	8.6		0.44	12.0	X	0.19	23900	X	3.3
WSA1-5	J1V906	6/16/16	0.11	B	0.032	3720	X	11.0	8.6	X	0.045	8.7		0.39	12.6	X	0.17	23000	X	3.0
WSA1-6	J1V907	6/16/16	0.12	B	0.031	3840	X	10.7	9.7	X	0.044	9.5		0.38	12.8	X	0.16	25300	X	2.9
WSA1-7	J1V908	6/16/16	0.13	B	0.029	3520	X	10.1	9.4	X	0.042	9.0		0.36	12.3	X	0.16	23000	X	2.7
WSA1-8	J1V909	6/16/16	0.088	B	0.031	3550	X	10.8	8.9	X	0.044	8.6		0.38	11.7	X	0.17	22200	X	2.9
WSA1-9	J1V910	6/16/16	0.14	B	0.040	4470	X	13.8	11.0	X	0.057	9.6		0.49	15.0	X	0.21	27600	X	3.7
WSA1-10	J1V911	6/16/16	0.14	B	0.034	3810	X	11.9	9.7	X	0.049	9.2		0.42	12.4	X	0.18	24300	X	3.2
WSA1-11	J1V912	6/16/16	0.14	B	0.038	5050	X	13.2	9.2	X	0.054	8.9		0.47	13.7	X	0.20	24600	X	3.6
WSA1-12	J1V913	6/16/16	0.085	B	0.033	3800	X	11.5	10.0	X	0.047	8.6		0.41	13.1	X	0.18	22400	X	3.1
Split of J1V902	J1V928	6/16/16	0.34	B	0.102	3710		8.19	9.37		0.154	9.89		0.154	13.9		0.307	22200		8.19
Equipment blank	J1V901	6/16/16	0.033	U	0.033	37.2	BCX	11.2	0.10	BX	0.046	0.079	U	0.079	0.27	BX	0.17	161	X	3.0
WSA2-10	J1V924	6/16/16	0.19		0.035	4400	X	11.9	6.5	X	0.049	6.8	X	0.084	12.1		0.18	22900	X	3.2
Duplicate of J1V924	J1V927	6/16/16	0.20		0.037	4690	X	12.6	7.2	X	0.052	7.3	X	0.089	14.0		0.19	26200	X	3.4
WSA2-1	J1V915	6/16/16	0.17		0.030	4950	X	10.5	5.2	X	0.043	7.4	X	0.074	12.6		0.16	24700	X	2.8
WSA2-2	J1V916	6/16/16	0.21	M	0.036	5160	X	12.5	3.8	X	0.052	8.2	X	0.089	13.7		0.19	28300	X	3.4
WSA2-3	J1V917	6/16/16	0.13	B	0.032	4700	X	11.0	3.6	X	0.045	5.5	X	0.078	11.5		0.17	20000	X	3.0
WSA2-4	J1V918	6/16/16	0.15		0.028	4060	X	9.6	4.4	X	0.040	6.5	X	0.068	11.4		0.15	21200	X	2.6
WSA2-5	J1V919	6/16/16	0.16	B	0.036	4660	X	12.3	6.3	X	0.051	5.4	X	0.087	11.6		0.19	20500	X	3.3
WSA2-6	J1V920	6/16/16	0.18		0.030	5190	X	10.5	7.0	X	0.043	7.4	X	0.074	13.4		0.16	25900	X	2.8
WSA2-7	J1V921	6/16/16	0.14		0.028	4720	X	9.6	8.2	X	0.040	4.9	X	0.068	10.9		0.15	18500	X	2.6
WSA2-8	J1V922	6/16/16	0.21	B	0.046	7050	X	16.0	5.2	X	0.066	8.9	X	0.11	17.1		0.25	32800	X	4.3
WSA2-9	J1V923	6/16/16	0.21		0.031	4420	X	10.5	5.5	X	0.043	6.5	X	0.075	13.4		0.16	22700	X	2.8
WSA2-11	J1V925	6/16/16	0.12	B	0.037	3920	X	12.7	4.6	X	0.052	4.8	X	0.090	9.0		0.20	17900	X	3.4
WSA2-12	J1V926	6/16/16	0.19		0.031	5020	X	10.5	9.7	X	0.043	5.5	X	0.075	13.0		0.16	21500	X	2.8
Split of J1V924	J1V929	6/16/16	0.341	B	0.0971	4500		7.77	7.14		0.146	10.6		0.146	14.2		0.291	22400		7.77

Attachment	1	Sheet No.	16 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Lead			Lithium			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
WSA1-1	J1V902	6/16/16	6.6		0.22	7.6	N	0.73	4500	X	3.0	355	X	0.080	0.010	B	0.0068	0.21	UN	0.21
Duplicate of J1V902	J1V914	6/16/16	6.7		0.25	7.6		0.85	4260	X	3.4	347	X	0.093	0.0090	B	0.0060	0.24	U	0.24
WSA1-2	J1V903	6/16/16	5.0		0.24	7.5		0.80	4340	X	3.3	367	X	0.088	0.0085	B	0.0065	0.23	U	0.23
WSA1-3	J1V904	6/16/16	9.0		0.27	7.5		0.91	4320	X	3.7	347	X	0.10	0.013	B	0.0068	0.26	U	0.26
WSA1-4	J1V905	6/16/16	4.7		0.24	6.7		0.79	4070	X	3.2	315	X	0.087	0.0092	B	0.0069	0.23	U	0.23
WSA1-5	J1V906	6/16/16	5.5		0.21	6.8		0.71	4280	X	2.9	328	X	0.078	0.0085	B	0.0066	0.20	U	0.20
WSA1-6	J1V907	6/16/16	7.3		0.21	7.6		0.69	4590	X	2.8	367	X	0.076	0.0086	B	0.0062	0.20	U	0.20
WSA1-7	J1V908	6/16/16	9.5		0.19	7.2		0.65	4240	X	2.7	336	X	0.072	0.013	B	0.0065	0.19	U	0.19
WSA1-8	J1V909	6/16/16	7.4		0.21	7.0		0.70	4110	X	2.8	325	X	0.076	0.0086	B	0.0069	0.20	U	0.20
WSA1-9	J1V910	6/16/16	6.5		0.26	8.5		0.89	5210	X	3.6	419	X	0.098	0.0091	B	0.0063	0.25	U	0.25
WSA1-10	J1V911	6/16/16	5.6		0.23	7.6		0.76	4480	X	3.1	349	X	0.084	0.010	B	0.0062	0.22	U	0.22
WSA1-11	J1V912	6/16/16	6.0		0.25	7.6		0.85	4570	X	3.5	373	X	0.093	0.0091	B	0.0060	0.24	U	0.24
WSA1-12	J1V913	6/16/16	5.3		0.22	7.5		0.74	4370	X	3.0	340	X	0.081	0.0083	B	0.0063	0.21	U	0.21
Split of J1V902	J1V928	6/16/16	5.73		0.338	9.32	D	0.393	4280		8.7	346		0.205	0.0064	B	0.0035	0.618	B	0.205
Equipment blank	J1V901	6/16/16	0.27	B	0.21	0.72	U	0.72	17.8	CX	2.9	3.3	X	0.079	0.0059	U	0.0059	0.21	U	0.21
WSA2-10	J1V924	6/16/16	4.3		0.23	6.1		0.77	3700		3.1	273	X	0.084	0.0080	B	0.0063	0.22	U	0.22
Duplicate of J1V924	J1V927	6/16/16	5.0		0.24	6.8		0.81	4260		3.3	313	X	0.089	0.0077	B	0.0064	0.23	U	0.23
WSA2-1	J1V915	6/16/16	2.0		0.20	4.0		0.67	3460		2.7	245	X	0.074	0.0066	U	0.0066	0.52	B	0.19
WSA2-2	J1V916	6/16/16	3.3		0.24	4.0		0.81	3790		3.3	277	X	0.089	0.0064	U	0.0064	0.37	BM	0.23
WSA2-3	J1V917	6/16/16	2.0		0.21	4.2		0.71	2950		2.9	206	X	0.078	0.0064	U	0.0064	0.20	B	0.20
WSA2-4	J1V918	6/16/16	1.7		0.18	4.3		0.62	3490		2.5	216	X	0.068	0.0063	U	0.0063	0.18	U	0.18
WSA2-5	J1V919	6/16/16	2.3		0.24	5.3		0.79	3570		3.2	221	X	0.087	0.0058	U	0.0058	0.23	U	0.23
WSA2-6	J1V920	6/16/16	2.5		0.20	5.1		0.68	4180		2.7	261	X	0.074	0.0059	U	0.0059	0.21	B	0.19
WSA2-7	J1V921	6/16/16	3.2		0.18	6.4		0.62	3360		2.5	219	X	0.068	0.0063	U	0.0063	0.61	B	0.18
WSA2-8	J1V922	6/16/16	3.1		0.31	6.3		1.0	4400		4.2	346	X	0.11	0.0079	U	0.0079	0.29	U	0.29
WSA2-9	J1V923	6/16/16	2.5		0.20	5.3		0.68	3520		2.8	231	X	0.075	0.0062	U	0.0062	0.19	U	0.19
WSA2-11	J1V925	6/16/16	1.9		0.24	3.8		0.82	2710		3.3	196	X	0.090	0.0063	U	0.0063	0.23	U	0.23
WSA2-12	J1V926	6/16/16	6.2		0.20	7.3		0.68	4020		2.8	271	X	0.075	0.023		0.0066	0.19	U	0.19
Split of J1V924	J1V929	6/16/16	3.38		0.32	6.5	D	0.38	4010		8.25	318		0.194	0.0040	U	0.0040	0.57	B	0.194

Attachment	1	Sheet No.	17 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Nickel			Potassium			Selenium			Silicon			Silver			Sodium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	9.9	X	0.098	1390		32.8	0.69	U	0.69	342	XN	4.5	0.13	U	0.13	223		47.2
Duplicate of J1V902	J1V914	6/16/16	9.5	X	0.11	1440		38.1	0.80	U	0.80	319	X	5.3	0.15	U	0.15	239		54.9
WSA1-2	J1V903	6/16/16	8.9	X	0.11	1690		36.1	0.89		0.76	442	X	5.0	0.14	U	0.14	237		52.0
WSA1-3	J1V904	6/16/16	9.4	X	0.12	1440		41.2	0.86	U	0.86	375	X	5.7	0.16	U	0.16	227		59.2
WSA1-4	J1V905	6/16/16	8.4	X	0.11	1230		35.8	0.75	U	0.75	355	X	4.9	0.14	U	0.14	222		51.5
WSA1-5	J1V906	6/16/16	9.4	X	0.096	1210		32.1	0.76	B	0.67	304	X	4.4	0.13	U	0.13	227		46.2
WSA1-6	J1V907	6/16/16	9.8	X	0.093	1390		31.2	0.65	U	0.65	348	X	4.3	0.12	U	0.12	254		44.8
WSA1-7	J1V908	6/16/16	9.3	X	0.088	1300		29.4	0.62	U	0.62	298	X	4.1	0.11	U	0.11	226		42.3
WSA1-8	J1V909	6/16/16	9.0	X	0.094	1370		31.3	0.66	U	0.66	314	X	4.3	0.12	U	0.12	200		45.1
WSA1-9	J1V910	6/16/16	10.5	X	0.12	1560		40.1	0.84	U	0.84	450	X	5.5	0.16	U	0.16	267		57.8
WSA1-10	J1V911	6/16/16	9.5	X	0.10	1340		34.5	0.72	U	0.72	348	X	4.8	0.13	U	0.13	228		49.6
WSA1-11	J1V912	6/16/16	9.9	X	0.11	1380		38.3	0.80	U	0.80	403	X	5.3	0.15	U	0.15	245		55.1
WSA1-12	J1V913	6/16/16	9.8	X	0.10	1350		33.3	0.70	U	0.70	323	X	4.6	0.13	U	0.13	219		47.9
Split of J1V902	J1V928	6/16/16	8.61		0.154	1240		6.55	1.07	D	0.324	359	N	1.54	0.102	U	0.102	132		7.17
Equipment blank	J1V901	6/16/16	0.098	UX	0.098	35.3	B	32.6	0.68	U	0.68	114	X	4.5	0.13	U	0.13	46.9	U	46.9
WSA2-10	J1V924	6/16/16	8.1	X	0.10	977		34.6	0.73	U	0.73	206		4.8	0.13	U	0.13	275		49.8
Duplicate of J1V924	J1V927	6/16/16	8.9	X	0.11	1020		36.6	0.77	U	0.77	257		5.1	0.14	U	0.14	280		52.7
WSA2-1	J1V915	6/16/16	7.5	X	0.091	548		30.4	0.64	U	0.64	152		4.2	0.12	U	0.12	309		43.7
WSA2-2	J1V916	6/16/16	6.6	X	0.11	602		36.4	0.76	UN	0.76	169		5.0	0.14	U	0.14	319		52.4
WSA2-3	J1V917	6/16/16	5.9	X	0.096	632		31.9	0.67	U	0.67	121		4.4	0.12	U	0.12	252		45.9
WSA2-4	J1V918	6/16/16	6.0	X	0.084	490		28.0	0.59	U	0.59	111		3.9	0.11	U	0.11	286		40.2
WSA2-5	J1V919	6/16/16	8.6	X	0.11	696		35.8	0.75	U	0.75	143		4.9	0.14	U	0.14	233		51.5
WSA2-6	J1V920	6/16/16	11.8	X	0.091	722		30.4	0.64	U	0.64	193		4.2	0.12	U	0.12	342		43.8
WSA2-7	J1V921	6/16/16	7.8	X	0.084	845		28.0	0.59	U	0.59	226		3.9	0.11	U	0.11	174		40.3
WSA2-8	J1V922	6/16/16	8.3	X	0.14	909		46.4	0.97	U	0.97	207		6.4	0.18	U	0.18	493		66.8
WSA2-9	J1V923	6/16/16	6.8	X	0.092	606		30.7	0.64	U	0.64	129		4.2	0.12	U	0.12	292		44.1
WSA2-11	J1V925	6/16/16	5.7	X	0.11	590		37.0	0.78	U	0.78	156		5.1	0.14	U	0.14	208		53.2
WSA2-12	J1V926	6/16/16	10.0	X	0.092	1100		30.6	0.64	U	0.64	272		4.2	0.12	U	0.12	207		44.1
Split of J1V924	J1V929	6/16/16	7.09		0.146	892		6.21	1.08	D	0.314	326	N	1.46	0.0971	U	0.0971	167		6.8

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Metals).

Sample Location	HEIS Number	Sample Date	Strontium			Tin			Uranium			Vanadium			Zinc			Zirconium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
WSA1-1	J1V902	6/16/16	21.3	X	0.029	0.73	UN	0.73	0.55		0.0013	54.6	X	0.075	47.7		1.6	22.2	X	0.28
Duplicate of J1V902	J1V914	6/16/16	21.0	X	0.033	0.85	U	0.85	0.66		0.0012	54.5	X	0.087	47.8		1.9	22.4	X	0.33
WSA1-2	J1V903	6/16/16	21.2	X	0.032	0.80	U	0.80	0.45		0.0011	58.8	X	0.083	49.1		1.8	24.3	X	0.31
WSA1-3	J1V904	6/16/16	19.4	X	0.036	0.92	U	0.92	0.50		0.0012	55.6	X	0.094	46.9		2.0	21.5	X	0.36
WSA1-4	J1V905	6/16/16	18.4	X	0.031	0.80	U	0.80	0.53		0.0015	59.3	X	0.082	46.9		1.7	22.4	X	0.31
WSA1-5	J1V906	6/16/16	18.3	X	0.028	0.71	U	0.71	0.46		0.0015	54.2	X	0.074	45.8		1.6	22.0	X	0.28
WSA1-6	J1V907	6/16/16	20.6	X	0.027	0.69	U	0.69	0.46		0.0013	59.8	X	0.071	49.3		1.5	23.3	X	0.27
WSA1-7	J1V908	6/16/16	20.2	X	0.026	0.65	U	0.65	0.59		0.0015	53.8	X	0.067	45.9		1.4	21.8	X	0.25
WSA1-8	J1V909	6/16/16	18.7	X	0.028	0.70	U	0.70	0.53		0.0015	52.7	X	0.072	46.8		1.5	20.5	X	0.27
WSA1-9	J1V910	6/16/16	22.0	X	0.035	0.89	U	0.89	0.54		0.0011	64.9	X	0.092	49.5		1.9	26.6	X	0.35
WSA1-10	J1V911	6/16/16	20.2	X	0.030	0.77	U	0.77	0.44		0.0011	57.2	X	0.079	47.7		1.7	22.4	X	0.30
WSA1-11	J1V912	6/16/16	20.6	X	0.034	0.85	U	0.85	0.50		0.0013	58.0	X	0.088	48.7		1.9	23.4	X	0.33
WSA1-12	J1V913	6/16/16	20.4	X	0.029	0.74	U	0.74	0.49		0.0013	53.4	X	0.076	45.4		1.6	20.9	X	0.29
Split of J1V902	J1V928	6/16/16	17.5		0.102	1.54	DU	1.54	0.95	*D	0.013	58.1		0.102	44.7		0.41	29.5	D	0.491
Equipment blank	J1V901	6/16/16	0.59	BX	0.029	0.72	U	0.72	0.13		0.0011	0.25	BX	0.075	0.65	B	0.32	0.67	BX	0.28
WSA2-10	J1V924	6/16/16	19.6	X	0.030	0.77	U	0.77	0.46		0.0012	50.7		0.079	39.6	X	0.34	22.1	X	0.30
Duplicate of J1V924	J1V927	6/16/16	21.2	X	0.032	0.82	U	0.82	0.46		0.0015	57.5		0.084	44.4	X	0.36	24.0	X	0.32
WSA2-1	J1V915	6/16/16	15.8	X	0.027	0.68	U	0.68	0.41		0.0012	64.9		0.070	41.5	X	0.30	22.9	X	0.26
WSA2-2	J1V916	6/16/16	38.4	XM	0.032	0.81	UN	0.81	0.49	M	0.0012	76.3		0.084	48.1	NX	0.35	27.3	X	0.31
WSA2-3	J1V917	6/16/16	16.4	X	0.028	0.71	U	0.71	0.41		0.0013	51.5		0.073	33.3	X	0.31	21.1	X	0.28
WSA2-4	J1V918	6/16/16	20.2	X	0.025	0.62	U	0.62	0.35		0.0014	53.2		0.064	35.1	X	0.27	20.4	X	0.24
WSA2-5	J1V919	6/16/16	24.5	X	0.031	0.80	U	0.80	0.35		0.0014	48.9		0.082	34.9	X	0.35	18.2	X	0.31
WSA2-6	J1V920	6/16/16	24.0	X	0.027	0.68	U	0.68	0.35		0.0011	65.1		0.070	42.4	X	0.30	24.8	X	0.26
WSA2-7	J1V921	6/16/16	22.2	X	0.025	0.62	U	0.62	0.36		0.0014	38.8		0.064	32.3	X	0.27	14.5	X	0.24
WSA2-8	J1V922	6/16/16	35.3	X	0.041	1.0	U	1.0	0.52		0.0018	80.7		0.11	54.6	X	0.45	34.9	X	0.40
WSA2-9	J1V923	6/16/16	25.8	X	0.027	0.68	U	0.68	0.44		0.0011	54.8		0.070	39.9	X	0.30	21.7	X	0.26
WSA2-11	J1V925	6/16/16	15.7	X	0.032	0.82	U	0.82	0.48		0.0013	44.3		0.085	30.7	X	0.36	16.1	X	0.32
WSA2-12	J1V926	6/16/16	24.1	X	0.027	0.68	U	0.68	0.70		0.0014	46.9		0.070	45.0	X	0.30	19.8	X	0.26
Split of J1V924	J1V929	6/16/16	17.6		0.0971	1.55	BD	1.46	0.471	*D	0.0126	65.3		0.0971	39.2		0.388	24.1	D	0.476

Attachment	1	Sheet No.	19 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (TPH & pH)

Sample Location	HEIS Number	Sample Date	TPH - diesel extended to C36			TPH - diesel range			TPH - motor oil (high boiling)			pH		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	pH	Q	PQL
ESA1-7	J1V8F8	3/2/16	1100	J	1000	1200	J	700				9.58		0.10
Duplicate of J1V8F8	J1V8H4	3/2/16	960	U	960	650	U	650				9.7		0.10
ESA1-1	J1V8F2	3/2/16	990	U	990	670	U	670				9.51		0.10
ESA1-2	J1V8F3	3/2/16	1000	U	1000	890	J	700				9.02		0.10
ESA1-3	J1V8F4	3/2/16	1000	U	1000	740	J	680				9.6		0.10
ESA1-4	J1V8F5	3/2/16	980	U	980	670	U	670				9.43		0.10
ESA1-5	J1V8F6	3/2/16	970	U	970	690	J	660				9.51		0.10
ESA1-6	J1V8F7	3/2/16	1000	U	1000	690	U	690				9.46		0.10
ESA1-8	J1V8F9	3/2/16	1000	U	1000	680	U	680				9.55		0.10
ESA1-9	J1V8H0	3/2/16	1800	J	1000	1500	J	700				9.24		0.10
ESA1-10	J1V8H1	3/2/16	1500	J	990	1100	J	680				9.44		0.10
ESA1-11	J1V8H2	3/2/16	1000	U	1000	690	U	690				9.57		0.10
ESA1-12	J1V8H3	3/2/16	1000	U	1000	690	U	690				9.09		0.10
FS-1	J1V8H5	3/2/16	970	U	970	660	U	660				9.48		0.10
FS-2	J1V8H6	3/2/16	990	U	990	670	U	670				9.66		0.10
FS-3	J1V8H7	3/2/16	1000	U	1000	810	J	680				8.86		0.10
FS-4	J1V8H8	3/2/16	2300	J	950	2000	J	640				9.38		0.10
Split of J1V8F8	J1V8K2	3/2/16				2660	J	2260	4220	J	2260	9.56	X	0.01
ESA2-3	J1V8J1	3/1/16	990	U	990	670	J	670				9.44		0.10
Duplicate of J1V8J1	J1V8K1	3/1/16	2100	J	980	1300	J	670				9.4		0.10
ESA2-1	J1V8H9	3/1/16	980	U	980	670	U	670				9.16		0.10
ESA2-2	J1V8J0	3/1/16	1000	U	1000	680	U	680				9.36		0.10
ESA2-4	J1V8J2	3/1/16	1000	U	1000	700	U	700				9.49		0.10
ESA2-5	J1V8J3	3/1/16	1000	U	1000	690	U	690				9.38		0.10
ESA2-6	J1V8J4	3/1/16	1600	J	1000	1100	J	710				9.34		0.10
ESA2-7	J1V8J5	3/1/16	1000	U	1000	710	U	710				9.44		0.10
ESA2-8	J1V8J6	3/1/16	1400	J	1000	1200	J	690				9.17		0.10
ESA2-9	J1V8J7	3/1/16	2300	J	1100	1600	J	730				9.22		0.10
ESA2-10	J1V8J8	3/1/16	1000	U	1000	710	U	710				9.27		0.10
ESA2-11	J1V8J9	3/1/16	1000	U	1000	710	U	710				9.13		0.10
ESA-12	J1V8K0	3/1/16	990	U	990	670	U	670				9.46		0.10
Split of J1V8J1	J1V8K3	3/1/16				3490	J	2260	6610	J	2260	8.21	X	0.01

Attachment	1	Sheet No.	20 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (TPH & pH)

Sample Location	HEIS Number	Sample Date	TPH - diesel extended			TPH - diesel range			TPH - motor oil (high boiling)			pH		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	pH	Q	PQL
WSA1-1	J1V902	6/16/16	11000	B	970	3900	B	660				8.77		0.1
Duplicate of J1V902	J1V914	6/16/16	14000	B	960	4800	B	660				8.77		0.1
WSA1-2	J1V903	6/16/16	26000	B	950	7200	B	640				8.32		0.1
WSA1-3	J1V904	6/16/16	7400	B	960	3300	JB	650				8.28		0.1
WSA1-4	J1V905	6/16/16	7500	B	960	2800	JB	650				8.54		0.1
WSA1-5	J1V906	6/16/16	6800	B	970	3300	JB	660				8.79		0.1
WSA1-6	J1V907	6/16/16	7900	B	960	3000	JB	650				8.29		0.1
WSA1-7	J1V908	6/16/16	8100	B	950	3300	JB	650				7.5		0.1
WSA1-8	J1V909	6/16/16	16000	B	960	6300	B	650				8.24		0.1
WSA1-9	J1V910	6/16/16	7000	B	970	3400	JB	660				8.64		0.1
WSA1-10	J1V911	6/16/16	11000	B	970	4000	B	660				7.91		0.1
WSA1-11	J1V912	6/16/16	12000	B	1000	4800	B	700				8.45		0.1
WSA1-12	J1V913	6/16/16	32000	B	980	8000	B	670				8.28		0.1
Split of J1V902	J1V928	6/16/16				2200	U	2200	6460	BJ	2200	8.79	X	0.01
WSA2-10	J1V924	6/16/16	4500	B	970	1900	JB	660				8.51		0.1
Duplicate of J1V924	J1V927	6/16/16	7300	B	1000	2200	JB	710				8.62		0.1
WSA2-1	J1V915	6/16/16	1800	JB	1000	1000	JB	680				9.17		0.1
WSA2-2	J1V916	6/16/16	2500	JB	970	1500	JB	660				8.45		0.1
WSA2-3	J1V917	6/16/16	1700	JB	990	970	JB	670				9.18		0.1
WSA2-4	J1V918	6/16/16	2100	JB	940	1400	JB	640				8.69		0.1
WSA2-5	J1V919	6/16/16	3300	JB	940	1800	JB	640				9.3		0.1
WSA2-6	J1V920	6/16/16	2700	JB	970	1700	JB	660				9.34		0.1
WSA2-7	J1V921	6/16/16	4000	B	980	1900	JB	660				8.87		0.1
WSA2-8	J1V922	6/16/16	3400	JB	1200	2000	JB	850				8.84		0.1
WSA2-9	J1V923	6/16/16	2600	JB	960	1800	JB	650				9.07		0.1
WSA2-11	J1V925	6/16/16	8500	B	1000	3300	JB	680				9.2		0.1
WSA2-12	J1V926	6/16/16	65000	B	990	23000	B	680				8.81		0.1
Split of J1V924	J1V929	6/16/16				2170	U	2170	4530	BJ	2170	8.62	X	0.01

Attachment	1	Sheet No.	21 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (PCBs).

Constituent	Class	J1V8F8 ESA1-7			J1V8H4 Duplicate of J1V8F8			J1V8F2 ESA1-1			J1V8F3 ESA1-2			J1V8F4 ESA1-3			J1V8F5 ESA1-4			J1V8F6 ESA1-5		
		3/2/16			3/2/16			3/2/16			3/2/16			3/2/16			3/2/16			3/2/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.6	U	2.6
Aroclor-1221	PCB	8.1	U	8.1	7.8	U	7.8	8.0	U	8.0	8.2	U	8.2	8.1	U	8.1	8.1	U	8.1	7.7	U	7.7
Aroclor-1232	PCB	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	4.5	U	4.5	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.5	U	4.5
Aroclor-1248	PCB	4.7	U	4.7	4.5	U	4.5	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.5	U	4.5
Aroclor-1254	PCB	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5
Aroclor-1260	PCB	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5
Aroclor-1262	PCB																					
Aroclor-1268	PCB																					

Constituent	Class	J1V8F7 ESA1-6			J1V8F9 ESA1-8			J1V8H0 ESA1-9			J1V8H1 ESA1-10			J1V8H2 ESA1-11			J1V8H3 ESA1-12			J1V8H5 FS-1		
		3/2/16			3/2/16			3/2/16			3/2/16			3/2/16			3/2/16			3/2/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.6	U	2.6	2.8	U	2.8	2.9	U	2.9	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8.0	U	8.0	8.2	U	8.2	7.6	U	7.6	8.2	U	8.2	8.3	U	8.3	8.0	U	8.0	8.0	U	8.0
Aroclor-1232	PCB	2.0	U	2.0	2.1	U	2.1	1.9	U	1.9	2.1	U	2.1	2.1	U	2.1	2.0	U	2.0	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	4.8	U	4.8	4.4	U	4.4	4.8	U	4.8	4.8	U	4.8	4.7	U	4.7	4.6	U	4.6
Aroclor-1248	PCB	4.7	U	4.7	4.8	U	4.8	4.4	U	4.4	4.8	U	4.8	4.8	U	4.8	4.7	U	4.7	4.6	U	4.6
Aroclor-1254	PCB	2.6	U	2.6	2.7	U	2.7	2.5	U	2.5	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.7	U	2.7	2.5	U	2.5	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.6	U	2.6
Aroclor-1262	PCB																					
Aroclor-1268	PCB																					

Constituent	Class	J1V8H6 FS-2			J1V8H7 FS-3			J1V8H8 FS-4			J1V8K2 Split of J1V8F8			J1V8J1 ESA2-3			J1V8K1 Duplicate of J1V8J1			J1V8H9 ESA2-1		
		3/2/16			3/2/16			3/2/16			3/2/16			3/1/16			3/1/16			3/1/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.9	U	2.9	2.7	U	2.7	2.6	U	2.6	1.16	U	1.16	2.8	U	2.8	2.8	U	2.8	2.9	U	2.9
Aroclor-1221	PCB	8.3	U	8.3	8.0	U	8.0	7.5	U	7.5	1.16	U	1.16	8.1	U	8.1	8.2	U	8.2	8.4	U	8.4
Aroclor-1232	PCB	2.1	U	2.1	2.0	U	2	1.9	U	1.9	1.16	U	1.16	2.0	U	2.0	2.0	U	2.0	2.1	U	2.1
Aroclor-1242	PCB	4.8	U	4.8	4.6	U	4.6	4.4	U	4.4	1.93	J	1.16	4.7	U	4.7	4.8	U	4.8	4.9	U	4.9
Aroclor-1248	PCB	4.8	U	4.8	4.6	U	4.6	44		4.4	1.16	U	1.16	4.7	U	4.7	4.8	U	4.8	4.9	U	4.9
Aroclor-1254	PCB	2.7	U	2.7	2.6	U	2.6	2.4	U	2.4	1.3	JP	1.16	13.0		2.6	12.0		2.7	2.7	U	2.7
Aroclor-1260	PCB	2.7	UN	2.7	2.6	U	2.6	3.6	J	2.4	1.25	J	1.16	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
Aroclor-1262	PCB										1.16	U	1.16									
Aroclor-1268	PCB										1.16	U	1.16									

Attachment	1	Sheet No.	22 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (PCBs).

Constituent	Class	J1V8J0 ESA2-2			J1V8J2 ESA2-4			J1V8J3 ESA2-5			J1V8J4 ESA2-6			J1V8J5 ESA2-7			J1V8J6 ESA2-8			J1V8J7 ESA2-9		
		3/1/16			3/1/16			3/1/16			3/1/16			3/1/16			3/1/16			3/1/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.9	U	2.9	2.9	U	2.9	2.7	U	2.7	2.7	U	2.7	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8.1	U	8.1	8.5	U	8.5	8.5	U	8.5	7.7	U	7.7	7.9	U	7.9	8.2	U	8.2	8.2	U	8.2
Aroclor-1232	PCB	2.0	U	2.0	2.1	U	2.1	2.1	U	2.1	1.9	U	1.9	2.0	U	2.0	2.1	U	2.1	2.0	U	2.0
Aroclor-1242	PCB	4.7	U	4.7	4.9	U	4.9	4.9	U	4.9	4.5	U	4.5	4.6	U	4.6	4.8	U	4.8	4.8	U	4.8
Aroclor-1248	PCB	4.7	U	4.7	4.9	U	4.9	4.9	U	4.9	4.5	U	4.5	4.6	U	4.6	4.8	U	4.8	4.8	U	4.8
Aroclor-1254	PCB	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	7.2	J	2.5	6.0	JP	2.6	2.7	U	2.7	3.9	J	2.7
Aroclor-1260	PCB	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	2.5	U	2.5	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
Aroclor-1262	PCB																					
Aroclor-1268	PCB																					

Constituent	Class	J1V8J8 ESA2-10			J1V8J9 ESA2-11			J1V8K0 ESA-12			J1V8K3 Split of J1V8J1		
		3/1/16			3/1/16			3/1/16			3/1/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.7	U	2.7	2.8	U	2.8	3.0	U	3.0	1.16	U	1.16
Aroclor-1221	PCB	7.9	U	7.9	8.2	U	8.2	8.6	U	8.6	1.16	U	1.16
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	2.1	U	2.1	1.16	U	1.16
Aroclor-1242	PCB	4.6	U	4.6	4.8	U	4.8	5.0	U	5.0	1.16	U	1.16
Aroclor-1248	PCB	4.6	U	4.6	4.8	U	4.8	5.0	U	5.0	1.16	U	1.16
Aroclor-1254	PCB	2.6	U	2.6	2.7	U	2.7	2.8	U	2.8	6.14		1.16
Aroclor-1260	PCB	2.6	U	2.6	2.7	U	2.7	2.8	U	2.8	3.74		1.16
Aroclor-1262	PCB										1.16	U	1.16
Aroclor-1268	PCB										1.16	U	1.16

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (PCBs).

Constituent	Class	J1V902			J1V914			J1V903			J1V904			J1V905			J1V906			J1V907		
		WSA1-1			Duplicate of J1V902			WSA1-2			WSA1-3			WSA1-4			WSA1-5			WSA1-6		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8
Aroclor-1221	PCB	8.1	U	8.1	7.9	U	7.9	8.1	U	8.1	7.7	U	7.7	8.0	U	8.0	8.1	U	8.1	8.2	U	8.2
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0	2.0	U	2.0	2.1	U	2.1
Aroclor-1242	PCB	4.7	U	4.7	4.6	U	4.6	4.7	U	4.7	4.5	U	4.5	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8
Aroclor-1248	PCB	4.7	U	4.7	4.6	U	4.6	4.7	U	4.7	4.5	U	4.5	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8
Aroclor-1254	PCB	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	2.7	U	2.7
Aroclor-1260	PCB	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	58		2.7
Aroclor-1262	PCB																					
Aroclor-1268	PCB																					

Constituent	Class	J1V908			J1V909			J1V910			J1V911			J1V912			J1V913			J1V928		
		WSA1-7			WSA1-8			WSA1-9			WSA1-10			WSA1-11			WSA1-12			Split of J1V902		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.7	U	2.7	2.7	U	2.7	2.8	U	2.8	2.9	U	2.9	2.7	U	2.7	2.8	U	2.8	1.12	U	1.12
Aroclor-1221	PCB	7.7	U	7.7	7.8	U	7.8	8.2	U	8.2	8.3	U	8.3	7.9	U	7.9	8.1	U	8.1	1.12	U	1.12
Aroclor-1232	PCB	1.9	U	1.9	2.0	U	2.0	2.0	U	2.0	2.1	U	2.1	2.0	U	2.0	2.0	U	2.0	1.12	U	1.12
Aroclor-1242	PCB	4.5	U	4.5	4.6	U	4.6	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6	4.7	U	4.7	1.12	U	1.12
Aroclor-1248	PCB	4.5	U	4.5	4.6	U	4.6	4.8	U	4.8	4.8	U	4.8	4.6	U	4.6	4.7	U	4.7	1.12	U	1.12
Aroclor-1254	PCB	2.5	U	2.5	2.5	U	2.5	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.6	U	2.6	1.12	U	1.12
Aroclor-1260	PCB	2.5	U	2.5	2.5	U	2.5	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.6	U	2.6	2.19	J	1.12
Aroclor-1262	PCB																			1.12	U	1.12
Aroclor-1268	PCB																			1.12	U	1.12

Constituent	Class	J1V924			J1V927			J1V915			J1V916			J1V917			J1V918			J1V919		
		WSA2-10			Duplicate of J1V924			WSA2-1			WSA2-2			WSA2-3			WSA2-4			WSA2-5		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	2.6	U	2.6	2.7	U	2.7	2.6	U	2.6	2.7	U	2.7
Aroclor-1221	PCB	8.1	U	8.1	8.1	U	8.1	8.1	U	8.1	7.4	U	7.4	7.8	U	7.8	7.6	U	7.6	7.9	U	7.9
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	1.8	U	1.8	1.9	U	1.9	1.9	U	1.9	2	U	2
Aroclor-1242	PCB	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.3	U	4.3	4.5	U	4.5	4.4	U	4.4	4.6	U	4.6
Aroclor-1248	PCB	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	4.3	U	4.3	4.5	U	4.5	4.4	U	4.4	4.6	U	4.6
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.4	U	2.4	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.4	U	2.4	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6
Aroclor-1262	PCB																					
Aroclor-1268	PCB																					

Attachment	1	Sheet No.	24 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (PCBs).

Constituent	Class	J1V920 WSA2-6			J1V921 WSA2-7			J1V922 WSA2-8			J1V923 WSA2-9			J1V925 WSA2-11			J1V926 WSA2-12			J1V929 Split of J1V924		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Aroclor-1016	PCB	2.6	U	2.6	2.7	U	2.7	3.6	U	3.6	2.8	U	2.8	2.8	U	2.8	2.8	U	2.8	1.12	U	1.12
Aroclor-1221	PCB	7.7	U	7.7	7.8	U	7.8	10	U	10	8	U	8	8.2	U	8.2	8.1	U	8.1	1.12	U	1.12
Aroclor-1232	PCB	1.9	U	1.9	2.0	U	2.0	2.6	U	2.6	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	1.12	U	1.12
Aroclor-1242	PCB	4.5	U	4.5	4.5	U	4.5	6.1	U	6.1	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	1.12	U	1.12
Aroclor-1248	PCB	4.5	U	4.5	4.5	U	4.5	6.1	U	6.1	4.7	U	4.7	4.7	U	4.7	4.7	U	4.7	1.12	U	1.12
Aroclor-1254	PCB	2.5	U	2.5	2.5	U	2.5	3.4	U	3.4	2.6	U	2.6	4.4	J	2.6	2.6	U	2.6	1.12	U	1.12
Aroclor-1260	PCB	2.5	U	2.5	2.5	U	2.5	3.4	U	3.4	2.6	U	2.6	2.6	U	2.6	51		2.6	1.12	U	1.12
Aroclor-1262	PCB																			1.12	U	1.12
Aroclor-1268	PCB																			1.12	U	1.12

Attachment	1	Sheet No.	25 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V8F8 ESA1-7			J1V8H4 Duplicate of J1V8F8			J1V8F2 ESA1-1			J1V8F3 ESA1-2			J1V8F4 ESA1-3			J1V8F5 ESA1-4			J1V8F6 ESA1-5		
		3/2/16			3/2/16			3/2/16			3/2/16			3/2/16			3/2/16			3/2/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27	29	U	29	28	U	28	26	U	26	27	U	27	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	23	U	23	22	U	22	21	U	21	21	U	21	21	U	21	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.8	U	9.8	9.4	U	9.4	9.7	U	9.7	9.7	U	9.7	10	U	10
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.8	U	9.8	9.4	U	9.4	9.7	U	9.7	9.7	U	9.7	10	U	10
2,4-Dichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.8	U	9.8	9.4	U	9.4	9.7	U	9.7	9.7	U	9.7	10	U	10
2,4-Dimethylphenol	SVOA	64	U	64	68	U	68	65	U	65	62	U	62	64	U	64	64	U	64	67	U	67
2,4-Dinitrophenol	SVOA	320	U	320	340	U	340	330	UX	330	310	U	310	320	U	320	320	U	320	340	U	340
2,4-Dinitrotoluene	SVOA	64	U	64	68	U	68	65	U	65	62	U	62	64	U	64	64	U	64	67	U	67
2,6-Dinitrotoluene	SVOA	27	U	27	29	U	29	28	U	28	26	U	26	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.7	U	9.7	10	U	10	9.8	U	9.8	9.4	U	9.4	9.7	U	9.7	9.7	U	9.7	10	U	10
2-Chlorophenol	SVOA	20	U	20	22	U	22	21	U	21	20	U	20	20	U	20	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	20	U	20	19	U	19	18	U	18	18	U	18	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	52	U	52	49	U	49	47	U	47	48	U	48	48	U	48	51	U	51
2-Nitrophenol	SVOA	9.7	U	9.7	10	U	10	9.8	U	9.8	9.4	U	9.4	9.7	U	9.7	9.7	U	9.7	10	U	10
3,3'-Dichlorobenzidine	SVOA	88	U	88	93	U	93	88	U	88	85	U	85	87	U	87	87	U	87	91	U	91
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	34	U	34	32	U	32	31	U	31	32	U	32	32	U	32	33	U	33
3-Nitroaniline	SVOA	71	U	71	75	U	75	72	U	72	69	U	69	71	U	71	70	U	70	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	340	U	340	320	U	320	310	U	310	320	U	320	320	U	320	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	20	U	20	19	U	19	18	U	18	18	U	18	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	68	U	68	65	U	65	62	U	62	64	U	64	64	U	64	67	U	67
4-Chloroaniline	SVOA	80	U	80	85	U	85	80	U	80	77	U	77	79	U	79	79	U	79	83	U	83
4-Chlorophenylphenyl ether	SVOA	20	U	20	22	U	22	21	U	21	20	U	20	20	U	20	20	U	20	21	U	21
4-Nitroaniline	SVOA	71	U	71	75	U	75	71	U	71	68	U	68	70	U	70	70	U	70	73	U	73
4-Nitrophenol	SVOA	95	U	95	100	U	100	95	U	95	92	U	92	94	U	94	94	U	94	98	U	98
Acenaphthene	SVOA	10	U	10	11	U	11	10	U	10	12	J	9.7	10	U	10	9.9	U	9.9	10	U	10
Acenaphthylene	SVOA	17	U	17	18	U	18	17	U	17	16	U	16	16	U	16	16	U	16	17	U	17
Anthracene	SVOA	17	U	17	18	U	18	17	U	17	16	U	16	16	U	16	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	19	U	19	21	U	21	20	U	20	19	U	19	19	U	19	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	21	U	21	20	U	20	19	U	19	19	U	19	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	27	U	27	26	U	26	25	U	25	25	U	25	25	U	25	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	17	U	17	16	U	16	15	U	15	15	U	15	15	U	15	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	41	U	41	39	U	39	38	U	38	39	U	39	39	U	39	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	24	U	24	23	U	23	22	U	22	22	U	22	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	24	U	24	23	U	23	22	U	22	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	16	U	16	16	U	16	16	U	16	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	92	J	45	48	U	48	45	U	45	43	U	43	44	U	44	44	U	44	47	U	47
Butylbenzylphthalate	SVOA	42	U	42	44	U	44	42	U	42	41	U	41	42	U	42	41	U	41	44	U	44
Carbazole	SVOA	35	U	35	37	U	37	35	U	35	34	U	34	35	U	35	35	U	35	36	U	36
Chrysene	SVOA	26	U	26	28	U	28	27	U	27	25	U	25	26	U	26	26	U	26	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	20	U	20	19	U	19	18	U	18	18	U	18	18	U	18	19	U	19
Dibenzofuran	SVOA	19	U	19	21	U	21	20	U	20	19	U	19	19	U	19	19	U	19	20	U	20
Diethyl phthalate	SVOA	25	U	25	27	U	27	26	U	26	25	U	25	25	U	25	25	U	25	26	U	26
Dimethyl phthalate	SVOA	22	U	22	24	U	24	23	U	23	22	U	22	22	U	22	22	U	22	23	U	23
Di-n-butylphthalate	SVOA	28	U	28	30	U	30	28	U	28	27	U	27	28	U	28	28	U	28	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14	15	U	15
Diphenylamine	SVOA																					
Fluoranthene	SVOA	35	U	35	37	U	37	35	U	35	34	U	34	35	U	35	35	U	35	36	U	36
Fluorene	SVOA	18	U	18	19	U	19	18	U	18	17	U	17	17	U	17	17	U	17	18	U	18
Hexachlorobenzene	SVOA	28	U	28	30	U	30	28	U	28	27	U	27	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.7	U	9.7	10	U	10	9.8	U	9.8	9.4	U	9.4	9.7	U	9.7	9.7	U	9.7	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	52	U	52	49	U	49	47	U	47	48	U	48	48	U	48	51	U	51
Hexachloroethane	SVOA	21	U	21	22	U	22	21	U	21	20	U	20	21	U	21	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	23	U	23	22	U	22	21	U	21	21	U	21	21	U	21	22	U	22
Isophorone	SVOA	17	U	17	18	U	18	17	U	17	16	U	16	16	U	16	16	U	16	17	U	17
Naphthalene	SVOA	30	U	30	32	U	32	30	U	30	29	U	29	30	U	30	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	23	U	23	22	U	22	21	U	21	21	U	21	21	U	21	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	32	U	32	30	U	30	29	U	29	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	20	U	20	22	U	22	21	U	21	20	U	20	20	U	20	20	U	20	21	U	21
Pentachlorophenol	SVOA	320	U	320	340	U	340	320	U	320	310	U	310	320	U	320	320	U	320	330	U	330
Phenanthrene	SVOA	17	U	17	18	U	18	17	U	17	17	J	16	16	U	16	16	U	16	17	U	17
Phenol	SVOA	18	U	18	19	U	19	18	U	18	17	U	17	17	U	17	17	U	17	18	U	18
Pyrene	SVOA	12	U	12	13	U	13	12	U	12	15	J	11	12	U	12	12	U	12	12	U	12
Tributyl phosphate	SVOA	56	U	56	60	U	60	57	U	57	54	U	54	56	U	56	56	U	56	58	U	58

Attachment	1	Sheet No.	26 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V8F7 ESA1-6 3/2/16			J1V8F9 ESA1-8 3/2/16			J1V8H0 ESA1-9 3/2/16			J1V8H1 ESA1-10 3/2/16			J1V8H2 ESA1-11 3/2/16			J1V8H3 ESA1-12 3/2/16			J1V8H5 FS-1 3/2/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	27	U	27	27	U	27	27	U	27	29	U	29	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	21	U	21	21	U	21	21	U	21	23	U	23	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	13	U	13	13	U	13	13	U	13	14	U	14	13	U	13
2,4,5-Trichlorophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	10	U	10	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	10	U	10	9.9	U	9.9
2,4-Dichlorophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	10	U	10	9.9	U	9.9
2,4-Dimethylphenol	SVOA	66	U	66	67	U	67	64	U	64	63	U	63	64	U	64	68	U	68	65	U	65
2,4-Dinitrophenol	SVOA	330	U	330	340	U	340	320	U	320	320	U	320	320	U	320	340	U	340	330	U	330
2,4-Dinitrotoluene	SVOA	66	U	66	67	U	67	64	U	64	63	U	63	64	U	64	68	U	68	65	U	65
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	27	U	27	27	U	27	27	U	27	29	U	29	28	U	28
2-Chloronaphthalene	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	10	U	10	9.9	U	9.9
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	22	U	22	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	50	U	50	51	U	51	48	U	48	48	U	48	49	U	49	51	U	51	50	U	50
2-Nitrophenol	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	10	U	10	9.9	U	9.9
3,3'-Dichlorobenzidine	SVOA	90	U	90	91	U	91	87	U	87	86	U	86	88	U	88	92	U	92	89	U	89
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	32	U	32	32	U	32	32	U	32	34	U	34	33	U	33
3-Nitroaniline	SVOA	73	U	73	74	U	74	70	U	70	70	U	70	71	U	71	75	U	75	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	320	U	320	320	U	320	320	U	320	340	U	340	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	66	U	66	67	U	67	64	U	64	63	U	63	64	U	64	68	U	68	65	U	65
4-Chloroaniline	SVOA	82	U	82	83	U	83	79	U	79	79	U	79	80	U	80	84	U	84	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	22	U	22	21	U	21
4-Nitroaniline	SVOA	72	U	72	73	U	73	70	U	70	70	U	70	71	U	71	74	U	74	72	U	72
4-Nitrophenol	SVOA	97	U	97	98	U	98	94	U	94	93	U	93	95	U	95	99	U	99	96	U	96
Acenaphthene	SVOA	10	U	10	10	U	10	9.9	U	9.9	9.9	U	9.9	10	U	10	11	U	11	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	21	U	21	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	21	U	21	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	27	U	27	25	U	25	25	U	25	26	U	26	27	U	27	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	15	U	15	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	40	U	40	41	U	41	39	U	39	38	U	38	39	U	39	41	U	41	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	22	U	22	22	U	22	22	U	22	24	U	24	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	22	U	22	22	U	22	22	U	22	24	U	24	23	U	23
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	16	U	16	17	U	17	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	47	U	47	44	U	44	44	U	44	45	U	45	47	U	47	46	U	46
Butylbenzylphthalate	SVOA	43	U	43	44	U	44	41	U	41	41	U	41	42	U	42	44	U	44	43	U	43
Carbazole	SVOA	36	U	36	36	U	36	35	U	35	35	U	35	35	U	35	37	U	37	36	U	36
Chrysene	SVOA	27	U	27	27	U	27	26	U	26	26	U	26	26	U	26	28	U	28	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	21	U	21	20	U	20
Diethyl phthalate	SVOA	26	U	26	26	U	26	25	U	25	25	U	25	25	U	25	27	U	27	26	U	26
Dimethyl phthalate	SVOA	23	U	23	23	U	23	22	U	22	22	U	22	22	U	22	24	U	24	23	U	23
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	28	U	28	28	U	28	28	U	28	30	U	30	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	15	U	15	14	U	14
Diphenylamine	SVOA																					
Fluoranthene	SVOA	36	U	36	36	U	36	35	U	35	35	U	35	35	U	35	37	U	37	36	U	36
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	29	U	29	29	U	29	28	U	28	28	U	28	28	U	28	30	U	30	29	U	29
Hexachlorobutadiene	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	10	U	10	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	50	U	50	51	U	51	48	U	48	48	U	48	49	U	49	51	U	51	50	U	50
Hexachloroethane	SVOA	21	U	21	22	U	22	21	U	21	20	U	20	21	U	21	22	U	22	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	21	U	21	21	U	21	21	U	21	23	U	23	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17	17	U	17
Naphthalene	SVOA	31	U	31	31	U	31	30	U	30	30	U	30	30	U	30	32	U	32	31	U	31
Nitrobenzene	SVOA	22	U	22	22	U	22	21	U	21	21	U	21	21	U	21	23	U	23	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	30	U	30	30	U	30	30	U	30	32	U	32	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	22	U	22	21	U	21
Pentachlorophenol	SVOA	330	U	330	330	U	330	320	U	320	320	U	320	320	U	320	340	U	340	330	U	330
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17	17	U	17
Phenol	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Tributyl phosphate	SVOA	58	U	58	58	U	58	56	U	56	55	U	55	56	U	56	59	U	59	57	U	57

Attachment	1	Sheet No.	27 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V8H6 FS-2			J1V8H7 FS-3			J1V8H8 FS-4			J1V8K2 Split of J1V8F8			J1V8J1 ESA2-3			J1V8K1 Duplicate of J1V8J1			J1V8H9 ESA2-1		
		3/2/16			3/2/16			3/2/16			3/2/16			3/1/16			3/1/16			3/1/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	27	U	27	27	U	27	104	U	104	30	U	30	27	U	27	29	U	29
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	21	U	21	104	U	104	23	U	23	21	U	21	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	104	U	104	13	U	13	12	U	12	13	U	13
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	13	U	13	104	U	104	14	U	14	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	9.8	U	9.8	9.7	U	9.7	104	U	104	11	U	11	9.7	U	9.7	11	U	11
2,4,6-Trichlorophenol	SVOA	10	U	10	9.8	U	9.8	9.7	U	9.7	104	U	104	11	U	11	9.7	U	9.7	11	U	11
2,4-Dichlorophenol	SVOA	10	U	10	9.8	U	9.8	9.7	U	9.7	104	U	104	11	U	11	9.7	U	9.7	11	U	11
2,4-Dimethylphenol	SVOA	67	U	67	65	U	65	64	U	64	104	U	104	70	U	70	64	U	64	70	U	70
2,4-Dinitrophenol	SVOA	340	U	340	330	U	330	320	U	320	104	U	104	350	U	350	320	U	320	350	U	350
2,4-Dinitrotoluene	SVOA	67	U	67	65	U	65	64	U	64	104	U	104	70	U	70	64	U	64	70	U	70
2,6-Dinitrotoluene	SVOA	28	U	28	27	U	27	27	U	27	104	U	104	30	U	30	27	U	27	29	U	29
2-Chloronaphthalene	SVOA	10	U	10	9.8	U	9.8	9.7	U	9.7	10.4	U	10.4	11	U	11	9.7	U	9.7	11	U	11
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	104	U	104	22	U	22	20	U	20	22	U	22
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	10.4	U	10.4	20	U	20	18	U	18	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	104	U	104	14	U	14	13	U	13	14	U	14
2-Nitroaniline	SVOA	50	U	50	49	U	49	48	U	48	114	U	114	53	U	53	49	U	49	53	U	53
2-Nitrophenol	SVOA	10	U	10	9.8	U	9.8	9.7	U	9.7	104	U	104	11	U	11	9.7	U	9.7	11	U	11
3,3'-Dichlorobenzidine	SVOA	91	U	91	88	U	88	87	U	87	104	U	104	95	U	95	87	U	87	95	U	95
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	32	U	32	32	U	32	104	U	104	35	U	35	32	U	32	35	U	35
3-Nitroaniline	SVOA	74	U	74	71	U	71	71	U	71	104	U	104	77	U	77	71	U	71	77	U	77
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	320	U	320	320	U	320	104	U	104	350	U	350	320	U	320	350	U	350
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	104	U	104	20	U	20	18	U	18	20	U	20
4-Chloro-3-methylphenol	SVOA	67	U	67	65	U	65	64	U	64	138	U	138	70	U	70	64	U	64	70	U	70
4-Chloroaniline	SVOA	83	U	83	80	U	80	79	U	79	104	U	104	86	U	86	80	U	80	86	U	86
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	104	U	104	22	U	22	20	U	20	22	U	22
4-Nitroaniline	SVOA	73	U	73	71	U	71	70	U	70	104	U	104	76	U	76	70	U	70	76	U	76
4-Nitrophenol	SVOA	98	U	98	95	U	95	94	U	94	104	U	104	100	U	100	94	U	94	100	U	100
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10.4	U	10.4	11	U	11	10	U	10	11	U	11
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	10.4	U	10.4	18	U	18	17	U	17	18	U	18
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	10.4	U	10.4	18	U	18	17	U	17	18	U	18
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	10.4	U	10.4	21	U	21	19	U	19	21	U	21
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	19	U	19	10.4	U	10.4	21	U	21	19	U	19	21	U	21
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	25	U	25	10.4	U	10.4	28	U	28	25	U	25	28	U	28
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	10.4	U	10.4	17	U	17	16	U	16	17	U	17
Benzo(k)fluoranthene	SVOA	40	U	40	39	U	39	39	U	39	10.4	U	10.4	42	U	42	39	U	39	42	U	42
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	22	U	22	104	U	104	24	U	24	22	U	22	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	22	U	22	104	U	104	24	U	24	22	U	22	24	U	24
Bis(2-chloroethyl) ether	SVOA	17	U	17	16	U	16	16	U	16	104	U	104	18	U	18	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	45	U	45	45	U	45	104	U	104	49	U	49	45	U	45	150	J	48
Butylbenzylphthalate	SVOA	43	U	43	42	U	42	42	U	42	104	U	104	45	U	45	42	U	42	45	U	45
Carbazole	SVOA	36	U	36	35	U	35	35	U	35	10.4	U	10.4	38	U	38	35	U	35	38	U	38
Chrysene	SVOA	27	U	27	26	U	26	26	U	26	10.4	U	10.4	28	U	28	26	U	26	28	U	28
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	18	U	18	10.4	U	10.4	20	U	20	18	U	18	20	U	20
Dibenzofuran	SVOA	20	U	20	20	U	20	19	U	19	104	U	104	21	U	21	19	U	19	21	U	21
Diethyl phthalate	SVOA	26	U	26	25	U	25	25	U	25	104	U	104	27	U	27	25	U	25	27	U	27
Dimethyl phthalate	SVOA	23	U	23	23	U	23	22	U	22	104	U	104	24	U	24	22	U	22	24	U	24
Di-n-butylphthalate	SVOA	29	U	29	28	U	28	28	U	28	104	U	104	31	U	31	28	U	28	31	U	31
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	14	U	14	104	U	104	15	U	15	14	U	14	15	U	15
Diphenylamine	SVOA										104	U	104									
Fluoranthene	SVOA	36	U	36	35	U	35	35	U	35	10.4	U	10.4	38	U	38	35	U	35	38	U	38
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	10.4	U	10.4	19	U	19	17	U	17	19	U	19
Hexachlorobenzene	SVOA	29	U	29	28	U	28	28	U	28	104	U	104	31	U	31	28	U	28	31	U	31
Hexachlorobutadiene	SVOA	10	U	10	9.8	U	9.8	9.7	U	9.7	104	U	104	11	U	11	9.7	U	9.7	11	U	11
Hexachlorocyclopentadiene	SVOA	50	U	50	49	U	49	48	U	48	104	U	104	53	U	53	49	U	49	53	U	53
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	104	U	104	22	U	22	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	21	U	21	10.4	U	10.4	23	U	23	21	U	21	23	U	23
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	104	U	104	18	U	18	17	U	17	18	U	18
Naphthalene	SVOA	31	U	31	30	U	30	30	U	30	10.4	U	10.4	33	U	33	30	U	30	33	U	33
Nitrobenzene	SVOA	22	U	22	22	U	22	21	U	21	104	U	104	23	U	23	21	U	21	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	30	U	30	30	U	30	104	U	104	33	U	33	30	U	30	33	U	33
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	20	U	20				22	U	22	20	U	20	22	U	22
Pentachlorophenol	SVOA	330	U	330	320	U	320	320	U	320	104	U	104	350	U	350	320	U	320	350	U	350
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	10.4	U	10.4	18	U	18	17	U	17	18	U	18
Phenol	SVOA	18	U	18	18	U	18	17	U	17	104	U	104	19	U	19	17	U	17	19	U	19
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	10.4	U	10.4	13	U	13	12	U	12	13	U	13
Tributyl phosphate	SVOA	58	U	58	57	U	57	56	U	56	104	U	104	61	U	61	56	U	56	61	U	61

Attachment	1	Sheet No.	28 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V8J0 ESA2-2 3/1/16			J1V8J2 ESA2-4 3/1/16			J1V8J3 ESA2-5 3/1/16			J1V8J4 ESA2-6 3/1/16			J1V8J5 ESA2-7 3/1/16			J1V8J6 ESA2-8 3/1/16			J1V8J7 ESA2-9 3/1/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	29	U	29	28	U	28	29	U	29	30	U	30
1,2-Dichlorobenzene	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23
1,3-Dichlorobenzene	SVOA	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13	13	U	13
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
2,4,6-Trichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
2,4-Dichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
2,4-Dimethylphenol	SVOA	69	U	69	69	U	69	68	U	68	67	U	67	67	U	67	69	U	69	70	U	70
2,4-Dinitrophenol	SVOA	350	U	350	350	U	350	340	U	340	340	U	340	340	U	340	350	U	350	350	U	350
2,4-Dinitrotoluene	SVOA	69	U	69	69	U	69	68	U	68	67	U	67	67	U	67	69	U	69	70	U	70
2,6-Dinitrotoluene	SVOA	29	U	29	29	U	29	29	U	29	29	U	29	28	U	28	29	U	29	30	U	30
2-Chloronaphthalene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
2-Chlorophenol	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22
2-Methylnaphthalene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	20	U	20	20	U	20
2-Methylphenol (cresol, o-)	SVOA	14	U	14	14	U	14	13	U	13	13	U	13	13	U	13	14	U	14	14	U	14
2-Nitroaniline	SVOA	52	U	52	52	U	52	51	U	51	51	U	51	51	U	51	52	U	52	53	U	53
2-Nitrophenol	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
3,3'-Dichlorobenzidine	SVOA	94	U	94	94	U	94	92	U	92	92	U	92	91	U	91	94	U	94	96	U	96
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	34	U	34	34	U	34	34	U	34	33	U	33	34	U	34	35	U	35
3-Nitroaniline	SVOA	76	U	76	76	U	76	75	U	75	74	U	74	74	U	74	76	U	76	78	U	78
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	340	U	340	340	U	340	340	U	340	330	U	330	340	U	340	350	U	350
4-Bromophenylphenyl ether	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	20	U	20	20	U	20
4-Chloro-3-methylphenol	SVOA	69	U	69	69	U	69	68	U	68	67	U	67	67	U	67	69	U	69	70	U	70
4-Chloroaniline	SVOA	86	U	86	85	U	85	84	U	84	84	U	84	83	U	83	86	U	86	87	U	87
4-Chlorophenylphenyl ether	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22
4-Nitroaniline	SVOA	76	U	76	75	U	75	74	U	74	74	U	74	74	U	74	76	U	76	77	U	77
4-Nitrophenol	SVOA	100	U	100	100	U	100	99	U	99	99	U	99	98	U	98	100	U	100	100	U	100
Acenaphthene	SVOA	11	U	11	11	U	11	11	U	11	11	U	11	10	U	10	11	U	11	11	U	11
Acenaphthylene	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	17	U	17	18	U	18	18	U	18
Anthracene	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	17	U	17	18	U	18	18	U	18
Benzo(a)anthracene	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
Benzo(a)pyrene	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
Benzo(b)fluoranthene	SVOA	27	U	27	27	U	27	27	U	27	27	U	27	27	U	27	27	U	27	28	U	28
Benzo(ghi)perylene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	16	U	16	17	U	17	17	U	17
Benzo(k)fluoranthene	SVOA	42	U	42	42	U	42	41	U	41	41	U	41	41	U	41	42	U	42	43	U	43
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	24	U	24	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	24	U	24	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18
Bis(2-ethylhexyl) phthalate	SVOA	60	J	48	48	U	48	47	U	47	47	U	47	47	U	47	48	U	48	49	U	49
Butylbenzylphthalate	SVOA	45	U	45	45	U	45	44	U	44	44	U	44	44	U	44	45	U	45	46	U	46
Carbazole	SVOA	38	U	38	37	U	37	37	U	37	37	U	37	37	U	37	38	U	38	38	U	38
Chrysene	SVOA	28	U	28	28	U	28	28	U	28	28	U	28	27	U	27	28	U	28	29	U	29
Dibenz[a,h]anthracene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	20	U	20	20	U	20
Dibenzofuran	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
Diethyl phthalate	SVOA	27	U	27	27	U	27	27	U	27	27	U	27	26	U	26	27	U	27	28	U	28
Dimethyl phthalate	SVOA	24	U	24	24	U	24	24	U	24	23	U	23	23	U	23	24	U	24	24	U	24
Di-n-butylphthalate	SVOA	30	U	30	30	U	30	30	U	30	30	U	30	29	U	29	30	U	30	31	U	31
Di-n-octylphthalate	SVOA	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
Diphenylamine	SVOA																					
Fluoranthene	SVOA	38	U	38	37	U	37	37	U	37	37	U	37	37	U	37	38	U	38	38	U	38
Fluorene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	18	U	18	19	U	19	19	U	19
Hexachlorobenzene	SVOA	30	U	30	30	U	30	30	U	30	30	U	30	29	U	29	30	U	30	31	U	31
Hexachlorobutadiene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
Hexachlorocyclopentadiene	SVOA	52	U	52	52	U	52	51	U	51	51	U	51	51	U	51	52	U	52	53	U	53
Hexachloroethane	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	22	U	22	22	U	22	23	U	23
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23
Isophorone	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	17	U	17	18	U	18	18	U	18
Naphthalene	SVOA	32	U	32	32	U	32	32	U	32	32	U	32	31	U	31	32	U	32	33	U	33
Nitrobenzene	SVOA	23	U	23	23	U	23	23	U	23	22	U	22	22	U	22	23	U	23	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	32	U	32	32	U	32	32	U	32	31	U	31	32	U	32	33	U	33
N-Nitrosodiphenylamine	SVOA	22	U	22	22	U	22	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22
Pentachlorophenol	SVOA	350	U	350	340	U	340	340	U	340	340	U	340	330	U	330	340	U	340	350	U	350
Phenanthrene	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	17	U	17	18	U	18	18	U	18
Phenol	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	18	U	18	19	U	19	19	U	19
Pyrene	SVOA	13	U	13	13	U	13	12	U	12	12	U	12	12	U	12	13	U	13	13	U	13
Tributyl phosphate	SVOA	60	U	60	60	U	60	59	U	59	59	U	59	59	U	59	60	U	60	61	U	61

Attachment	1	Sheet No.	29 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V8J8 ESA2-10 3/1/16			J1V8J9 ESA2-11 3/1/16			J1V8K0 ESA-12 3/1/16			J1V8K3 Split of J1V8J1 3/1/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	29	U	29	28	U	28	28	U	28	104	U	104
1,2-Dichlorobenzene	SVOA	23	U	23	22	U	22	22	U	22	104	U	104
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	104	U	104
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	14	U	14	104	U	104
2,4,5-Trichlorophenol	SVOA	10	U	10	9.9	U	9.9	9.9	U	9.9	104	U	104
2,4,6-Trichlorophenol	SVOA	10	U	10	9.9	U	9.9	9.9	U	9.9	104	U	104
2,4-Dichlorophenol	SVOA	10	U	10	9.9	U	9.9	9.9	U	9.9	104	U	104
2,4-Dimethylphenol	SVOA	69	U	69	66	U	66	66	U	66	104	U	104
2,4-Dinitrophenol	SVOA	350	U	350	330	U	330	330	U	330	104	U	104
2,4-Dinitrotoluene	SVOA	69	U	69	66	U	66	66	U	66	104	U	104
2,6-Dinitrotoluene	SVOA	29	U	29	28	U	28	28	U	28	104	U	104
2-Chloronaphthalene	SVOA	10	U	10	9.9	U	9.9	9.9	U	9.9	10.4	U	10.4
2-Chlorophenol	SVOA	22	U	22	21	U	21	21	U	21	104	U	104
2-Methylnaphthalene	SVOA	20	U	20	19	U	19	19	U	19	10.4	U	10.4
2-Methylphenol (cresol, o-)	SVOA	14	U	14	13	U	13	13	U	13	104	U	104
2-Nitroaniline	SVOA	52	U	52	50	U	50	50	U	50	115	U	115
2-Nitrophenol	SVOA	10	U	10	9.9	U	9.9	9.9	U	9.9	104	U	104
3,3'-Dichlorobenzidine	SVOA	94	U	94	90	U	90	90	U	90	104	U	104
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	33	U	33	33	U	33	104	U	104
3-Nitroaniline	SVOA	76	U	76	73	U	73	73	U	73	104	U	104
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	330	U	330	330	U	330	104	U	104
4-Bromophenylphenyl ether	SVOA	20	U	20	19	U	19	19	U	19	104	U	104
4-Chloro-3-methylphenol	SVOA	69	U	69	66	U	66	66	U	66	139	U	139
4-Chloroaniline	SVOA	85	U	85	81	U	81	81	U	81	104	U	104
4-Chlorophenylphenyl ether	SVOA	22	U	22	21	U	21	21	U	21	104	U	104
4-Nitroaniline	SVOA	75	U	75	72	U	72	72	U	72	104	U	104
4-Nitrophenol	SVOA	100	U	100	97	U	97	96	U	96	104	U	104
Acenaphthene	SVOA	11	U	11	10	U	10	10	U	10	10.4	U	10.4
Acenaphthylene	SVOA	18	U	18	17	U	17	17	U	17	10.4	U	10.4
Anthracene	SVOA	18	U	18	17	U	17	17	U	17	10.4	U	10.4
Benzo(a)anthracene	SVOA	21	U	21	20	U	20	20	U	20	10.4	U	10.4
Benzo(a)pyrene	SVOA	21	U	21	20	U	20	20	U	20	10.4	U	10.4
Benzo(b)fluoranthene	SVOA	27	U	27	26	U	26	26	U	26	10.4	U	10.4
Benzo(ghi)perylene	SVOA	17	U	17	16	U	16	16	U	16	10.4	U	10.4
Benzo(k)fluoranthene	SVOA	42	U	42	40	U	40	40	U	40	10.4	U	10.4
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	23	U	23	23	U	23	104	U	104
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	23	U	23	23	U	23	104	U	104
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	17	U	17	104	U	104
Bis(2-ethylhexyl) phthalate	SVOA	48	U	48	46	U	46	46	U	46	104	U	104
Butylbenzylphthalate	SVOA	45	U	45	43	U	43	43	U	43	104	U	104
Carbazole	SVOA	37	U	37	36	U	36	36	U	36	10.4	U	10.4
Chrysene	SVOA	28	U	28	27	U	27	27	U	27	10.4	U	10.4
Dibenz[a,h]anthracene	SVOA	20	U	20	19	U	19	19	U	19	10.4	U	10.4
Dibenzofuran	SVOA	21	U	21	20	U	20	20	U	20	104	U	104
Diethyl phthalate	SVOA	27	U	27	26	U	26	26	U	26	104	U	104
Dimethyl phthalate	SVOA	24	U	24	23	U	23	23	U	23	104	U	104
Di-n-butylphthalate	SVOA	30	U	30	29	U	29	29	U	29	104	U	104
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	14	U	14	104	U	104
Diphenylamine	SVOA										104	U	104
Fluoranthene	SVOA	37	U	37	36	U	36	36	U	36	10.4	U	10.4
Fluorene	SVOA	19	U	19	18	U	18	18	U	18	10.4	U	10.4
Hexachlorobenzene	SVOA	30	U	30	29	U	29	29	U	29	104	U	104
Hexachlorobutadiene	SVOA	10	U	10	9.9	U	9.9	9.9	U	9.9	104	U	104
Hexachlorocyclopentadiene	SVOA	52	U	52	50	U	50	50	U	50	104	U	104
Hexachloroethane	SVOA	22	U	22	21	U	21	21	U	21	104	U	104
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	22	U	22	22	U	22	10.4	U	10.4
Isophorone	SVOA	18	U	18	17	U	17	17	U	17	104	U	104
Naphthalene	SVOA	32	U	32	31	U	31	31	U	31	10.4	U	10.4
Nitrobenzene	SVOA	23	U	23	22	U	22	22	U	22	104	U	104
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	31	U	31	31	U	31	104	U	104
N-Nitrosodiphenylamine	SVOA	22	U	22	21	U	21	21	U	21			
Pentachlorophenol	SVOA	340	U	340	330	U	330	330	U	330	104	U	104
Phenanthrene	SVOA	18	U	18	17	U	17	17	U	17	10.4	U	10.4
Phenol	SVOA	19	U	19	18	U	18	18	U	18	104	U	104
Pyrene	SVOA	13	U	13	12	U	12	12	U	12	10.4	U	10.4
Tributyl phosphate	SVOA	60	U	60	57	U	57	57	U	57	104	U	104

Attachment	1	Sheet No.	30 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V902 WSA1-1			J1V914 Duplicate of J1V902			J1V903 WSA1-2			J1V904 WSA1-3			J1V905 WSA1-4			J1V906 WSA1-5			J1V907 WSA1-6		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	27	U	27	29	U	29	29	U	29	28	U	28	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	21	U	21	23	U	23	23	U	23	22	U	22	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	14	U	14	14	U	14	14	U	14	13	U	13
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.7	U	9.7	10	U	10	10	U	10	10	U	10	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.7	U	9.7	10	U	10	10	U	10	10	U	10	9.8	U	9.8
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.7	U	9.7	10	U	10	10	U	10	10	U	10	9.8	U	9.8
2,4-Dimethylphenol	SVOA	65	U	65	66	U	66	64	U	64	68	U	68	68	U	68	66	U	66	64	U	64
2,4-Dinitrophenol	SVOA	330	U	330	330	U	330	320	U	320	340	U	340	340	U	340	330	U	330	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65	66	U	66	64	U	64	68	U	68	68	U	68	66	U	66	64	U	64
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	27	U	27	29	U	29	29	U	29	28	U	28	27	U	27
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	9.7	U	9.7	10	U	10	10	U	10	10	U	10	9.8	U	9.8
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	22	U	22	22	U	22	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	20	U	20	19	U	19	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	50	U	50	50	U	50	49	U	49	52	U	52	51	U	51	50	U	50	49	U	49
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	9.7	U	9.7	10	U	10	10	U	10	10	U	10	9.8	U	9.8
3,3'-Dichlorobenzidine	SVOA	89	U	89	90	U	90	88	U	88	93	U	93	92	U	92	90	U	90	88	U	88
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	32	U	32	34	U	34	34	U	34	33	U	33	32	U	32
3-Nitroaniline	SVOA	72	U	72	73	U	73	71	U	71	76	U	76	75	U	75	73	U	73	71	U	71
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	320	U	320	340	U	340	340	U	340	330	U	330	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	20	U	20	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	66	U	66	64	U	64	68	U	68	68	U	68	66	U	66	64	U	64
4-Chloroaniline	SVOA	81	U	81	82	U	82	80	U	80	85	U	85	84	U	84	82	U	82	80	U	80
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	22	U	22	22	U	22	21	U	21	21	U	21
4-Nitroaniline	SVOA	72	U	72	72	U	72	71	U	71	75	U	75	74	U	74	72	U	72	71	U	71
4-Nitrophenol	SVOA	96	U	96	97	U	97	94	U	94	100	U	100	99	U	99	97	U	97	95	U	95
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	11	U	11	11	U	11	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	18	U	18	17	U	17	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	18	U	18	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	21	U	21	20	U	20	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	23	J	20	20	U	20	19	U	19	21	U	21	20	U	20	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	25	U	25	27	U	27	27	U	27	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	260	J	16	16	U	16	16	U	16	17	U	17	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	40	U	40	40	U	40	39	U	39	41	U	41	41	U	41	40	U	40	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	22	U	22	24	U	24	24	U	24	23	U	23	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	22	U	22	24	U	24	24	U	24	23	U	23	22	U	22
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	16	U	16	17	U	17	17	U	17	17	U	17	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	46	U	46	45	U	45	48	U	48	47	U	47	46	U	46	45	U	45
Butylbenzylphthalate	SVOA	43	U	43	43	U	43	42	U	42	45	U	45	44	U	44	43	U	43	42	U	42
Carbazole	SVOA	36	U	36	36	U	36	35	U	35	37	U	37	37	U	37	36	U	36	35	U	35
Chrysene	SVOA	27	U	27	27	U	27	26	U	26	28	U	28	28	U	28	27	U	27	26	U	26
Dibenz[a,h]anthracene	SVOA	150	J	19	19	U	19	18	U	18	20	U	20	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	20	U	20	20	U	20	19	U	19	21	U	21	20	U	20	20	U	20	20	U	20
Diethyl phthalate	SVOA	26	U	26	26	U	26	25	U	25	27	U	27	27	U	27	26	U	26	25	U	25
Dimethyl phthalate	SVOA	23	U	23	23	U	23	22	U	22	24	U	24	24	U	24	23	U	23	22	U	22
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	28	U	28	30	U	30	30	U	30	29	U	29	28	U	28
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Diphenylamine	SVOA																					
Fluoranthene	SVOA	36	U	36	36	U	36	35	U	35	37	U	37	37	U	37	36	U	36	35	U	35
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	19	U	19	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	29	U	29	29	U	29	28	U	28	30	U	30	30	U	30	29	U	29	28	U	28
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	9.7	U	9.7	10	U	10	10	U	10	10	U	10	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	50	U	50	50	U	50	49	U	49	52	U	52	51	U	51	50	U	50	49	U	49
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	22	U	22	22	U	22	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	180	J	22	22	U	22	21	U	21	23	U	23	23	U	23	22	U	22	21	U	21
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	18	U	18	17	U	17	17	U	17	17	U	17
Naphthalene	SVOA	31	U	31	31	U	31	30	U	30	32	U	32	32	U	32	31	U	31	30	U	30
Nitrobenzene	SVOA	22	U	22	22	U	22	21	U	21	23	U	23	23	U	23	22	U	22	21	U	21
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	30	U	30	32	U	32	32	U	32	31	U	31	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	20	U	20	22	U	22	22	U	22	21	U	21	21	U	21
Pentachlorophenol	SVOA	330	U	330	330	U	330	320	U	320	340	U	340	340	U	340	330	U	330	320	U	320
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	18	U	18	17	U	17	17	U	17	17	U	17
Phenol	SVOA	18	U	18	18	U	18	18	U	18	19	U	19	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	13	U	13	12	U	12	12	U	12	12	U	12
Tributyl phosphate	SVOA	57	U	57	58	U	58	56	U	56	60	U	60	59	U	59	57	U	57	56	U	56

Attachment	1	Sheet No.	31 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V908 WSA1-7			J1V909 WSA1-8			J1V910 WSA1-9			J1V911 WSA1-10			J1V912 WSA1-11			J1V913 WSA1-12			J1V928 Split of J1V902		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	29	U	29	27	U	27	28	U	28	103	U	103
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	21	U	21	22	U	22	103	U	103
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12	103	U	103
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	13	U	13	14	U	14	13	U	13	14	U	14	103	U	103
2,4,5-Trichlorophenol	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	9.5	U	9.5	10	U	10	103	U	103
2,4,6-Trichlorophenol	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	9.5	U	9.5	10	U	10	103	U	103
2,4-Dichlorophenol	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	9.5	U	9.5	10	U	10	103	U	103
2,4-Dimethylphenol	SVOA	67	U	67	66	U	66	65	U	65	67	U	67	63	U	63	66	U	66	103	U	103
2,4-Dinitrophenol	SVOA	340	U	340	330	U	330	330	U	330	340	U	340	320	U	320	330	U	330	103	U	103
2,4-Dinitrotoluene	SVOA	67	U	67	66	U	66	65	U	65	67	U	67	63	U	63	66	U	66	103	U	103
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	28	U	28	29	U	29	27	U	27	28	U	28	103	U	103
2-Chloronaphthalene	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	9.5	U	9.5	10	U	10	10.3	U	10.3
2-Chlorophenol	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	20	U	20	21	U	21	103	U	103
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	19	U	19	19	U	19	18	U	18	19	U	19	10.3	U	10.3
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13	103	U	103
2-Nitroaniline	SVOA	51	U	51	50	U	50	49	U	49	51	U	51	48	U	48	50	U	50	113	U	113
2-Nitrophenol	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	9.5	U	9.5	10	U	10	103	U	103
3,3'-Dichlorobenzidine	SVOA	91	U	91	90	U	90	89	U	89	92	U	92	86	U	86	90	U	90	103	U	103
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	33	U	33	34	U	34	31	U	31	33	U	33	103	U	103
3-Nitroaniline	SVOA	74	U	74	73	U	73	72	U	72	74	U	74	70	U	70	73	U	73	103	U	103
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	330	U	330	340	U	340	310	U	310	330	U	330	103	U	103
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	19	U	19	18	U	18	19	U	19	103	U	103
4-Chloro-3-methylphenol	SVOA	67	U	67	66	U	66	65	U	65	67	U	67	63	U	63	66	U	66	137	U	137
4-Chloroaniline	SVOA	83	U	83	82	U	82	81	U	81	83	U	83	78	U	78	82	U	82	103	U	103
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	20	U	20	21	U	21	103	U	103
4-Nitroaniline	SVOA	73	U	73	73	U	73	72	U	72	74	U	74	69	U	69	73	U	73	103	U	103
4-Nitrophenol	SVOA	98	U	98	98	U	98	96	U	96	99	U	99	93	U	93	97	U	97	103	U	103
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10	10.3	U	10.3
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	16	U	16	17	U	17	10.3	U	10.3
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	16	U	16	17	U	17	10.3	U	10.3
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	20	U	20	72	J	20	19	U	19	20	U	20	10.3	U	10.3
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	20	U	20	49	J	20	19	U	19	20	U	20	10.3	U	10.3
Benzo(b)fluoranthene	SVOA	27	U	27	26	U	26	26	U	26	76	J	27	25	U	25	26	U	26	10.3	U	10.3
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16	10.3	U	10.3
Benzo(k)fluoranthene	SVOA	41	U	41	40	U	40	40	U	40	41	U	41	38	U	38	40	U	40	10.3	U	10.3
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	23	U	23	23	U	23	22	U	22	23	U	23	103	U	103
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	23	U	23	23	U	23	22	U	22	23	U	23	103	U	103
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	16	U	16	17	U	17	16	U	16	17	U	17	103	U	103
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	46	U	46	46	U	46	47	U	47	44	U	44	46	U	46	103	U	103
Butylbenzylphthalate	SVOA	44	U	44	43	U	43	43	U	43	44	U	44	41	U	41	43	U	43	103	U	103
Carbazole	SVOA	36	U	36	36	U	36	36	U	36	37	U	37	34	U	34	36	U	36	10.3	U	10.3
Chrysene	SVOA	27	U	27	27	U	27	27	U	27	70	J	27	26	U	26	27	U	27	10.3	U	10.3
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	19	U	19	19	U	19	18	U	18	19	U	19	10.3	U	10.3
Dibenzofuran	SVOA	20	U	20	20	U	20	20	U	20	20	U	20	19	U	19	20	U	20	103	U	103
Diethyl phthalate	SVOA	26	U	26	26	U	26	26	U	26	26	U	26	25	U	25	26	U	26	103	U	103
Dimethyl phthalate	SVOA	23	U	23	23	U	23	23	U	23	23	U	23	22	U	22	23	U	23	103	U	103
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	29	U	29	30	U	30	28	U	28	29	U	29	103	U	103
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	14	U	14	15	U	15	14	U	14	14	U	14	103	U	103
Diphenylamine	SVOA																			103	U	103
Fluoranthene	SVOA	36	U	36	36	U	36	36	U	36	100	J	37	34	U	34	36	U	36	10.3	U	10.3
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	18	U	18	17	U	17	18	U	18	10.3	U	10.3
Hexachlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	30	U	30	28	U	28	29	U	29	103	U	103
Hexachlorobutadiene	SVOA	10	U	10	10	U	10	9.9	U	9.9	10	U	10	9.5	U	9.5	10	U	10	103	U	103
Hexachlorocyclopentadiene	SVOA	51	U	51	50	U	50	49	U	49	51	U	51	48	U	48	50	U	50	103	U	103
Hexachloroethane	SVOA	22	U	22	21	U	21	21	U	21	22	U	22	20	U	20	21	U	21	103	U	103
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	21	U	21	22	U	22	10.3	U	10.3
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	16	U	16	17	U	17	103	U	103
Naphthalene	SVOA	31	U	31	31	U	31	31	U	31	32	U	32	30	U	30	31	U	31	10.3	U	10.3
Nitrobenzene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	21	U	21	22	U	22	103	U	103
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	31	U	31	32	U	32	30	U	30	31	U	31	103	U	103
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	20	U	20	21	U	21			
Pentachlorophenol	SVOA	330	U	330	330	U	330	330	U	330	340	U	340	310	U	310	330	U	330	103	U	103
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	74	J	17	16	U	16	17	U	17	10.3	U	10.3
Phenol	SVOA	18	U	18	18	U	18	18	U	18	18	U	18	17	U	17	18	U	18	103	U	103
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	120	J	12	12	U	12	12	U	12	10.3	U	10.3
Tributyl phosphate	SVOA	58	U	58	58	U	58	57	U	57	59	U	59	55	U	55	58	U	58	103	U	103

Attachment	1	Sheet No.	32 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 West Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V924 WSA2-10			J1V927 Duplicate of J1V924			J1V915 WSA2-1			J1V916 WSA2-2			J1V917 WSA2-3			J1V918 WSA2-4			J1V919 WSA2-5		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	26	U	26	26	U	26	26	U	26	27	U	27	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	11	U	11	11	U	11	11	U	11	11	U	11	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.4	U	9.4	9.3	U	9.3	9.4	U	9.4	9.5	U	9.5	9.7	U	9.7
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.4	U	9.4	9.3	U	9.3	9.4	U	9.4	9.5	U	9.5	9.7	U	9.7
2,4-Dichlorophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.4	U	9.4	9.3	U	9.3	9.4	U	9.4	9.5	U	9.5	9.7	U	9.7
2,4-Dimethylphenol	SVOA	65	U	65	66	U	66	62	U	62	61	U	61	62	U	62	63	U	63	64	U	64
2,4-Dinitrophenol	SVOA	330	U	330	330	U	330	310	U	310	310	U	310	310	UX	310	320	U	320	320	U	320
2,4-Dinitrotoluene	SVOA	65	U	65	66	U	66	62	U	62	61	U	61	62	U	62	63	U	63	64	U	64
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	26	U	26	26	U	26	26	U	26	27	U	27	27	U	27
2-Chloronaphthalene	SVOA	9.9	U	9.9	9.9	U	9.9	9.4	U	9.4	9.3	U	9.3	9.4	U	9.4	9.5	U	9.5	9.7	U	9.7
2-Chlorophenol	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	20	U	20	20	U	20
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
2-Nitroaniline	SVOA	49	U	49	50	U	50	47	U	47	47	U	47	47	U	47	48	U	48	48	U	48
2-Nitrophenol	SVOA	9.9	U	9.9	9.9	U	9.9	9.4	U	9.4	9.3	U	9.3	9.4	U	9.4	9.5	U	9.5	9.7	U	9.7
3,3'-Dichlorobenzidine	SVOA	89	U	89	89	U	89	85	U	85	84	U	84	84	U	84	86	U	86	87	U	87
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	31	U	31	31	U	31	31	U	31	31	U	31	32	U	32
3-Nitroaniline	SVOA	72	U	72	72	U	72	69	U	69	68	U	68	68	U	68	69	U	69	71	U	71
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	310	U	310	310	U	310	310	U	310	310	U	310	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
4-Chloro-3-methylphenol	SVOA	65	U	65	66	U	66	62	U	62	61	U	61	62	U	62	63	U	63	64	U	64
4-Chloroaniline	SVOA	81	U	81	81	U	81	77	U	77	76	U	76	77	U	77	78	U	78	79	U	79
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	20	U	20	20	U	20
4-Nitroaniline	SVOA	71	U	71	72	U	72	68	U	68	68	U	68	68	U	68	69	U	69	70	U	70
4-Nitrophenol	SVOA	96	U	96	96	U	96	91	U	91	90	U	90	91	U	91	92	U	92	94	U	94
Acenaphthene	SVOA	10	U	10	10	U	10	9.7	U	9.7	9.6	U	9.6	9.7	U	9.7	9.8	U	9.8	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Anthracene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	25	U	25	24	U	24	25	U	25	25	U	25	25	U	25
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	15	U	15	15	U	15	15	U	15	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	40	U	40	38	U	38	37	U	37	38	U	38	38	U	38	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	46	U	46	43	U	43	43	U	43	43	U	43	44	U	44	45	U	45
Butylbenzylphthalate	SVOA	42	U	42	43	U	43	40	U	40	40	U	40	40	U	40	41	U	41	42	U	42
Carbazole	SVOA	35	U	35	36	U	36	34	U	34	34	U	34	34	U	34	34	U	34	35	U	35
Chrysene	SVOA	27	U	27	27	U	27	25	U	25	25	U	25	25	U	25	26	U	26	26	U	26
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	18	U	18	18	U	18	18	U	18	18	U	18	18	U	18
Dibenzofuran	SVOA	20	U	20	20	U	20	19	U	19	19	U	19	19	U	19	19	U	19	19	U	19
Diethyl phthalate	SVOA	26	U	26	26	U	26	24	U	24	24	U	24	24	U	24	25	U	25	25	U	25
Dimethyl phthalate	SVOA	23	U	23	23	U	23	22	U	22	21	U	21	22	U	22	22	U	22	22	U	22
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	27	U	27	27	U	27	27	U	27	28	U	28	28	U	28
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	13	U	13	14	U	14	14	U	14	14	U	14
Diphenylamine	SVOA																					
Fluoranthene	SVOA	35	U	35	36	U	36	34	U	34	34	U	34	34	U	34	34	U	34	35	U	35
Fluorene	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Hexachlorobenzene	SVOA	29	U	29	29	U	29	27	U	27	27	U	27	27	U	27	28	U	28	28	U	28
Hexachlorobutadiene	SVOA	9.9	U	9.9	9.9	U	9.9	9.4	U	9.4	9.3	U	9.3	9.4	U	9.4	9.5	U	9.5	9.7	U	9.7
Hexachlorocyclopentadiene	SVOA	49	U	49	50	U	50	47	U	47	47	U	47	47	U	47	48	U	48	48	U	48
Hexachloroethane	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	20	U	20	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
Isophorone	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Naphthalene	SVOA	31	U	31	31	U	31	29	U	29	29	U	29	29	U	29	29	U	29	30	U	30
Nitrobenzene	SVOA	22	U	22	22	U	22	21	U	21	20	U	20	21	U	21	21	U	21	21	U	21
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	29	U	29	29	U	29	29	U	29	29	U	29	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	20	U	20	20	U	20	20	U	20	20	U	20	20	U	20
Pentachlorophenol	SVOA	330	U	330	330	U	330	310	U	310	310	U	310	310	U	310	310	U	310	320	U	320
Phenanthrene	SVOA	17	U	17	17	U	17	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Phenol	SVOA	18	U	18	18	U	18	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Pyrene	SVOA	12	U	12	12	U	12	11	U	11	11	U	11	11	U	11	12	U	12	12	U	12
Tributyl phosphate	SVOA	57	U	57	57	U	57	54	U	54	54	U	54	54	U	54	55	U	55	56	U	56

Attachment	1	Sheet No.	33 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Attachment 1. 300-288:2 East Sample Area Verification Sample Results (Organics - SVOA).

Constituent	Class	J1V920 WSA2-6			J1V921 WSA2-7			J1V922 WSA2-8			J1V923 WSA2-9			J1V925 WSA2-11			J1V926 WSA2-12			J1V929 Split of J1V924		
		6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16			6/16/16		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	26	U	26	28	U	28	34	U	34	27	U	27	28	U	28	27	U	27	101	U	101
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	27	U	27	21	U	21	22	U	22	21	U	21	101	U	101
1,3-Dichlorobenzene	SVOA	11	U	11	12	U	12	15	U	15	12	U	12	12	U	12	12	U	12	101	U	101
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	17	U	17	13	U	13	13	U	13	13	U	13	101	U	101
2,4,5-Trichlorophenol	SVOA	9.4	U	9.4	9.9	U	9.9	12	U	12	9.6	U	9.6	9.8	U	9.8	9.6	U	9.6	101	U	101
2,4,6-Trichlorophenol	SVOA	9.4	U	9.4	9.9	U	9.9	12	U	12	9.6	U	9.6	9.8	U	9.8	9.6	U	9.6	101	U	101
2,4-Dichlorophenol	SVOA	9.4	U	9.4	9.9	U	9.9	12	U	12	9.6	U	9.6	9.8	U	9.8	9.6	U	9.6	101	U	101
2,4-Dimethylphenol	SVOA	62	U	62	65	U	65	80	U	80	64	U	64	65	U	65	63	U	63	101	U	101
2,4-Dinitrophenol	SVOA	310	U	310	330	U	330	400	U	400	320	U	320	330	U	330	320	U	320	101	U	101
2,4-Dinitrotoluene	SVOA	62	U	62	65	U	65	80	U	80	64	U	64	65	U	65	63	U	63	101	U	101
2,6-Dinitrotoluene	SVOA	26	U	26	28	U	28	34	U	34	27	U	27	28	U	28	27	U	27	101	U	101
2-Chloronaphthalene	SVOA	9.4	U	9.4	9.9	U	9.9	12	U	12	9.6	U	9.6	9.8	U	9.8	9.6	U	9.6	10.1	U	10.1
2-Chlorophenol	SVOA	20	U	20	21	U	21	25	U	25	20	U	20	21	U	21	20	U	20	101	U	101
2-Methylnaphthalene	SVOA	18	U	18	19	U	19	23	U	23	18	U	18	19	U	19	18	U	18	10.1	U	10.1
2-Methylphenol (cresol, o-)	SVOA	12	U	12	13	U	13	16	U	16	13	U	13	13	U	13	12	U	12	101	U	101
2-Nitroaniline	SVOA	47	U	47	50	U	50	61	U	61	48	U	48	49	U	49	48	U	48	111	U	111
2-Nitrophenol	SVOA	9.4	U	9.4	9.9	U	9.9	12	U	12	9.6	U	9.6	9.8	U	9.8	9.6	U	9.6	101	U	101
3,3'-Dichlorobenzidine	SVOA	84	U	84	89	U	89	110	U	110	87	U	87	89	U	89	86	U	86	101	U	101
3+4 Methylphenol (cresol, m+p)	SVOA	31	U	31	33	U	33	40	U	40	32	U	32	32	U	32	32	U	32	101	U	101
3-Nitroaniline	SVOA	68	U	68	72	U	72	89	U	89	70	U	70	72	U	72	70	U	70	101	U	101
4,6-Dinitro-2-methylphenol	SVOA	310	U	310	330	U	330	400	U	400	320	U	320	320	U	320	320	U	320	101	U	101
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	23	U	23	18	U	18	19	U	19	18	U	18	101	U	101
4-Chloro-3-methylphenol	SVOA	62	U	62	65	U	65	80	U	80	64	U	64	65	U	65	63	U	63	135	U	135
4-Chloroaniline	SVOA	77	U	77	81	U	81	99	U	99	79	U	79	81	U	81	79	U	79	101	U	101
4-Chlorophenylphenyl ether	SVOA	20	U	20	21	U	21	25	U	25	20	U	20	21	U	21	20	U	20	101	U	101
4-Nitroaniline	SVOA	68	U	68	72	U	72	88	U	88	70	U	70	71	U	71	70	U	70	101	U	101
4-Nitrophenol	SVOA	91	U	91	96	U	96	120	U	120	93	U	93	96	U	96	93	U	93	101	U	101
Acenaphthene	SVOA	9.6	U	9.6	10	U	10	13	U	13	9.9	U	9.9	10	U	10	9.9	U	9.9	10.1	U	10.1
Acenaphthylene	SVOA	16	U	16	17	U	17	21	U	21	16	U	16	17	U	17	16	U	16	10.1	U	10.1
Anthracene	SVOA	16	U	16	17	U	17	21	U	21	16	U	16	17	U	17	16	U	16	10.1	U	10.1
Benzo(a)anthracene	SVOA	19	U	19	20	U	20	24	U	24	19	U	19	20	U	20	19	U	19	10.1	U	10.1
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	24	U	24	19	U	19	20	U	20	19	U	19	10.1	U	10.1
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	32	U	32	25	U	25	26	U	26	25	U	25	10.1	U	10.1
Benzo(ghi)perylene	SVOA	15	U	15	16	U	16	19	U	19	15	U	15	16	U	16	15	U	15	10.1	U	10.1
Benzo(k)fluoranthene	SVOA	37	U	37	40	U	40	49	U	49	38	U	38	39	U	39	38	U	38	10.1	U	10.1
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	28	U	28	22	U	22	23	U	23	22	U	22	101	U	101
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	28	U	28	22	U	22	23	U	23	22	U	22	101	U	101
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	20	U	20	16	U	16	16	U	16	16	U	16	101	U	101
Bis(2-ethylhexyl) phthalate	SVOA	43	U	43	46	U	46	56	U	56	44	U	44	45	U	45	44	U	44	101	U	101
Butylbenzylphthalate	SVOA	40	U	40	43	U	43	52	U	52	41	U	41	42	U	42	41	U	41	101	U	101
Carbazole	SVOA	34	U	34	36	U	36	44	U	44	35	U	35	35	U	35	35	U	35	10.1	U	10.1
Chrysene	SVOA	25	U	25	27	U	27	33	U	33	26	U	26	27	U	27	26	U	26	10.1	U	10.1
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	23	U	23	18	U	18	19	U	19	18	U	18	10.1	U	10.1
Dibenzofuran	SVOA	19	U	19	20	U	20	24	U	24	19	U	19	20	U	20	19	U	19	101	U	101
Diethyl phthalate	SVOA	24	U	24	26	U	26	32	U	32	25	U	25	26	U	26	25	U	25	101	U	101
Dimethyl phthalate	SVOA	22	U	22	23	U	23	28	U	28	22	U	22	23	U	23	22	U	22	101	U	101
Di-n-butylphthalate	SVOA	27	U	27	29	U	29	35	U	35	28	U	28	29	U	29	28	U	28	101	U	101
Di-n-octylphthalate	SVOA	13	U	13	14	U	14	17	U	17	14	U	14	14	U	14	14	U	14	101	U	101
Diphenylamine	SVOA																			101	U	101
Fluoranthene	SVOA	34	U	34	36	U	36	44	U	44	35	U	35	35	U	35	35	U	35	10.1	U	10.1
Fluorene	SVOA	17	U	17	18	U	18	22	U	22	17	U	17	18	U	18	17	U	17	10.1	U	10.1
Hexachlorobenzene	SVOA	27	U	27	29	U	29	35	U	35	28	U	28	29	U	29	28	U	28	101	U	101
Hexachlorobutadiene	SVOA	9.4	U	9.4	9.9	U	9.9	12	U	12	9.6	U	9.6	9.8	U	9.8	9.6	U	9.6	101	U	101
Hexachlorocyclopentadiene	SVOA	47	U	47	50	U	50	61	U	61	48	U	48	49	U	49	48	U	48	101	U	101
Hexachloroethane	SVOA	20	U	20	21	U	21	26	U	26	20	U	20	21	U	21	20	U	20	101	U	101
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	27	U	27	21	U	21	22	U	22	21	U	21	10.1	U	10.1
Isophorone	SVOA	16	U	16	17	U	17	21	U	21	16	U	16	17	U	17	16	U	16	101	U	101
Naphthalene	SVOA	29	U	29	31	U	31	38	U	38	30	U	30	31	U	31	30	U	30	10.1	U	10.1
Nitrobenzene	SVOA	21	U	21	22	U	22	27	U	27	21	U	21	22	U	22	21	U	21	101	U	101
N-Nitroso-di-n-dipropylamine	SVOA	29	U	29	31	U	31	38	U	38	30	U	30	31	U	31	30	U	30	101	U	101
N-Nitrosodiphenylamine	SVOA	20	U	20	21	U	21	25	U	25	20	U	20	21	U	21	20	U	20			
Pentachlorophenol	SVOA	310	U	310	330	U	330	400	U	400	320	U	320	320	U	320	320	U	320	101	U	101
Phenanthrene	SVOA	16	U	16	17	U	17	21	U	21	16	U	16	17	U	17	16	U	16	10.1	U	10.1
Phenol	SVOA	17	U	17	18	U	18	22	U	22	17	U	17	18	U	18	17	U	17	101	U	101
Pyrene	SVOA	11	U	11	12	U	12	15	U	15	12	U	12	12	U	12	13	J	12	10.1	U	10.1
Tributyl phosphate	SVOA	54	U	54	57	U	57	70	U	70	56	U	56	57	U	57	55	U	55	101	U	101

Attachment	1	Sheet No.	34 of 34
Originator	R. J. Nielson	Date	7/27/16
Checked	J. M. Capron	Job No.	14655
Calc. No.	0300X-CA-V0244	Rev. No.	0

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 300 Area Closure Operations **Job No. 14655**

Area: 300

Discipline: Environmental *Calculation No: 0300X-CA-V0245

Subject: 300-288:2 Subsite Direct Contact Hazard Quotient and Carcinogenic Risk Calculations

Computer Program: Excel Program No: Excel 2010

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

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 4 Total = 5	R. J. Nielson	J M Capron	B. L. Vedder	S. G. Wilkinson	8/5/16

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:	R. J. Nielson	Date:	07/27/16	Calc. No.:	0300X-CA-V0245	Rev.:	0
Project:	300 Area Closure Operations	Job No:	14655	Checked:	J. M. Capron	Date:	07/27/16
Subject:	300-288:2 Subsite Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	1 of 4

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk of contaminants of concern (COCs) for waste sites identified as requiring remove, treat, and dispose in Table 1 of the 300 Area Final ROD (EPA 2013). In accordance with the nonradionuclides evaluation of risk standards in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2016), 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 $<1 \times 10^{-6}$ (residential) or $<1 \times 10^{-5}$ (industrial) for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2016, *Remedial Design Report/Remedial Action Work Plan for 300-FF-2 Soils*, DOE/RL-2014-13-ADD1, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) EPA, 2013, *Record of Decision for the 300-FF-2 Operable Unit and 300-FF-5, and Record of Decision Amendment for 300-FF-1, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

3) WCH, 2016a, *300-288:2 Subsite Cleanup Verification 95% UCL Calculations*, 0300X-CA-V0244, Rev. 0, Washington Closure Hanford, Richland, Washington.

4) WCH, 2016b, *Cleanup Verification Package for the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 Subsite*, CVP-2016-00001, Attachment to Waste Site Reclassification Form 2016-008, Rev. 0, Washington Closure Hanford, Richland, Washington.

SOLUTION:

Hazard Quotient and Excess Carcinogenic Risk Calculations

The residential hazard quotient and cancer risk values are calculated by substituting the appropriate residential daily intake factors, calculated as described in Appendix C of the RDR/RAWP (DOE-RL 2016), into the Appendix C equations for the hazard quotient and cancer risk. Values of the reference doses (RfDs) and cancer potency factors (CPFs) for use in calculating the hazard quotient and cancer risk are also provided in Appendix C of the RDR/RAWP (DOE-RL 2016).

1) Generate an HQ for each constituent with noncarcinogenic effects detected above background and compare it to the individual HQ of <1.0. The calculation is performed as necessary for residential land use as described in the RDR/RAWP (DOE-RL 2016) and presented in Table 1.

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

Washington Closure Hanford CALCULATION SHEET

Originator:	R. J. Nielson	Date:	07/27/16	Calc. No.:	0300X-CA-V0245	Rev.:	0
Project:	300 Area Closure Operations	Job No:	14655	Checked:	J. M. Capron	Date:	07/27/16
Subject:	300-288:2 Subsite Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	2 of 4

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background and compare it to the excess cancer risk of <1 x 10^{-6} for residential land use calculation (DOE-RL 2016).

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

METHODOLOGY:

Hazard Quotient and Excess Carcinogenic Risk Calculations

The 300-288:2 subsite included two decision units, and each decision unit was further divided into two sample areas. Each sample area underwent statistical sampling. One duplicate sample and one split sample were also collected from each sample area. Additionally, four focused samples were collected. The direct contact hazard quotient and carcinogenic risk calculations for the 300-288:2 subsite were performed for the entire waste site using the statistical or maximum value for each COC detected above background, as described in the referenced cleanup verification package document (WCH 2016b), and/or the 95% upper confidence limit (UCL) calculation (WCH 2016a). Of the COCs for this site, antimony, mercury, and selenium were detected above Hanford Site background levels and require direct contact hazard quotient and carcinogenic risk calculations. Strontium, the detected polycyclic aromatic hydrocarbons (PAHs), the detected polychlorinated biphenyls (PCBs), and the total BaP TEC are included because they were detected and a Hanford Site background value is not available. The risk associated with total petroleum hydrocarbons (diesel range, diesel range extended, and motor oil) do not contribute to the cumulative toxicity calculation. All other site nonradionuclide COCs were either not detected or were quantified below background levels.

The 300-288:2 subsite data sets were evaluated against the residential cumulative direct contact hazard quotient standards (Table 1).

Calculations for the 300-4 waste site were performed using parameters and equations for residential land use from the RDR/RAWP (DOE-RL 2016). An example of the HQ and risk calculations of COCs for residential land use using data for the 300-288:2 subsite is presented below.

1) To calculate the HQ, the maximum value for antimony is 0.55 mg/kg, multiplied by the daily intake factor (1.25 x 10^{-5}) and divided by the reference dose (RfD) of 0.0004 mg/kg-day, resulting in an HQ of 1.72 x 10^{-2}. Comparing this value, and all other individual values for the 300-288:2 subsite to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate COCs, 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 2.93 x 10^{-2} for the 300-288:2 subsite. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum value for aroclor-1260, 0.058 mg/kg, is multiplied by the daily intake factor (1.0 x 10^{-6}) and the cancer potency factor of 2.0 mg/kg-day, with a resulting value of 1.16 x 10^{-7}. Comparing this value, and all other individual values for the 300-288:2 subsite to the threshold of <1 x 10^{-6}, this criterion is met.

Washington Closure Hanford CALCULATION SHEET

Originator:	R. J. Nielson	Date:	07/27/16	Calc. No.:	0300X-CA-V0245	Rev.:	0
Project:	300 Area Closure Operations	Job No:	14655	Checked:	J. M. Capron	Date:	07/27/16
Subject:	300-288:2 Subsite Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	3 of 4

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 cumulative cancer risk values is 9.48×10^{-7} for the 300-288:2 subsite. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

Hazard Quotient and Excess Carcinogenic Risk Calculations – 300-288:2 Subsite COCs

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 residential direct contact calculations.

CONCLUSION:

The calculations for residential land use summarized in Table 1 demonstrate that the 300-288:2 subsite identified as requiring remove, treat, and dispose in Table 1 of the 300 Area Final ROD (EPA 2013) meets the requirements for the residential direct contact hazard quotient and excess carcinogenic risk, respectively, as identified in the RDR/RAWP (DOE-RL 2016). The hazard quotient and carcinogenic (excess cancer) risk calculations are for use in the CVP for this site.

Washington Closure Hanford CALCULATION SHEET

Originator:	R. J. Nielson	Date:	07/27/16	Calc. No.:	0300X-CA-V0245	Rev.:	0
Project:	300 Area Closure Operations	Job No:	14655	Checked:	J. M. Capron	Date:	07/27/16
Subject:	300-288:2 Subsite Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	4 of 4

Table 1. Residential Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 300-288:2 Subsite.

COCs	Statistical or Maximum Value[a] (mg/kg)	Oral Reference Dose (RfD)[b] (mg/kg-day)	Hazard Quotient	Cancer Potency (Slope) Factor[b] (mg/kg-day) -1	Cancer Risk
Metals (mg/kg)					
Antimony	0.55	4.00E-04	1.72E-02	--	--
Mercury	0.024	3.00E-04	1.00E-03	--	--
Selenium	0.89	5.00E-03	2.23E-03	--	--
Strontium	27.3	6.00E-01	5.69E-04	--	--
Inorganics and TPH (mg/kg)					
TPH - Diesel Range EXT[c]	31	NA	--	NA	--
Volatile Organic Compounds (VOCs) (mg/kg)					
Polycyclic Aromatic Hydrocarbons (mg/kg)					
Acenaphthene	0.012	6.00E-02	2.50E-06	--	--
BaP TEC[d]	0.098	--	--	7.30E+00	7.15E-07
Benzo(a)anthracene[e]	0.072	--	--	7.30E-01	5.26E-08
Benzo(a)pyrene[e]	0.049				
Benzo(b)fluoranthene[e]	0.076	--	--	7.30E-01	5.55E-08
Benzo(g,h,i)perylene[f]	0.26	NA	--	NA	--
Bis(2-ethylhexyl) phthalate	0.15	2.00E-02	9.38E-05	1.40E-02	2.10E-09
Chrysene[e]	0.070	--	--	7.30E-02	5.11E-09
Dibenz[a,h]anthracene[e]	0.15	--	--	7.30E-01	1.10E-07
Fluoranthene	0.10	4.00E-02	3.13E-05	--	--
Indeno(1,2,3-cd)pyrene[e]	0.18	--	--	7.30E-01	1.31E-07
Phenanthrene[f]	0.074	--	--	--	--
Pyrene	0.12	3.00E-02	5.00E-05	--	--
Polychlorinated Biphenyls (mg/kg)					
PCB Aroclor 1248	0.044	--	--	2.00E+00	8.80E-08
PCB Aroclor 1254	0.013	2.00E-05	8.13E-03	2.00E+00	2.60E-08
PCB Aroclor 1260	0.058	--	--	2.00E+00	1.16E-07
COCs Cumulative Hazard Quotient:			**2.93E-02**		
COCs Cumulative Excess Cancer Risk:					**9.48E-07**

[a] From (WCH 2016a).
[b] Value obtained from the RDR/RAWP (DOE-RL 2016)
[c] The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.
[d] Evaluation of the compliance of benzo(a)pyrene with cleanup levels includes the toxic equivalent concentration of the carcinogenic PAHs. This includes the COC chrysene.
[e] Included in BAP Toxic Equivalency Concentration
[f] Toxicity data for this chemical is not available. RfD value for benzo(g,h,i)perylene based on surrogate pyrene, phenanthrene based on surrogate anthracene.
-- = not applicable
BaP = benzo(a)pyrene
COC = contaminant of concern
TEC = toxic equivalent concentration

APPENDIX B

DATA QUALITY ASSESSMENT

APPENDIX B

DATA QUALITY ASSESSMENT

VERIFICATION SAMPLING

A data quality assessment (DQA) was performed to compare the verification sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (WCH 2016b). This DQA was performed in accordance with site-specific data quality objectives found in the *300 Area Remedial Action Sampling and Analysis Plan* (300 Area SAP) (DOE-RL 2014).

A review of the sample design (WCH 2016b), field logbook (WCH 2016a), and the applicable analytical data package has been performed as part of this DQA. All samples were collected and analyzed per the sample design. To ensure quality data, the 300 Area SAP (DOE-RL 2014) data assurance requirements and the data validation procedures for chemical analysis (BHI 2000) are used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., closeout decisions). The DQA completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2006).

Verification sample data collected at the 300-288:2 subsite were provided by the laboratories in six sample delivery groups (SDGs): JP1035, JP1036, JP1046, JP1047, XP0226, and XP0229. SDG JP1035 was submitted for third-party validation.

No major deficiencies were identified in this data set. Minor deficiencies identified in the analytical data sets are discussed in the minor deficiencies section. If no comments are made about a specific analysis, no deficiencies affecting the quality of the data for that analysis were identified.

MINOR DEFICIENCIES

SDG JP1035

This SDG is comprised of 13 verification soil samples (J1V8H9, J1V8J0 through J1V8J9, J1V8K0, and J1V8K1). Samples J1V8J1 and J1V8K1 comprise a field duplicate pair. These samples were collected on March 1, 2016, and analyzed for gamma-emitting radionuclides, uranium isotopes, metals, mercury, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH). SDG JP1035 was submitted for third-party validation. Minor deficiencies are as follows.

In the metals analysis, the matrix spike (MS) recoveries for antimony (49%), calcium (165%), silicon (25%), tin (68%), and zinc (47%) were outside the quality control (QC) limits. The laboratory control sample (LCS) recovery for silicon (11%) was also outside the QC limits. The relative percent difference (RPD) for the laboratory duplicate for calcium (36%), zirconium (33%), and vanadium (35%) were all outside the QC limits. Third-party validation, therefore, qualified all associated field sample results as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the isotopic uranium analysis, due to the lack of LCS analysis, all uranium-235 results were qualified as estimated with "J" flags by third party validation. Estimated data are usable for decision-making purposes.

SDG JP1036

This SDG is comprised of 17 verification soil samples (J1V8F2 through J1V8F9 and J1V8H0 through J1V8H8) and one equipment blank (J1V8F1). Samples J1V8F8 and J1V8H4 comprise a field duplicate pair. These samples were collected on March 2, 2016, and analyzed for gamma-emitting radionuclides, uranium isotopes, metals, mercury, PCBs, SVOCs, and TPH. Minor deficiencies are as follows.

In the metals analysis, the MS recoveries for all metals except mercury and uranium were below the project QC limits. The RPD values for the laboratory duplicate for aluminum (31%), barium (42%), beryllium (40%), calcium (40%), cobalt (37%), iron (36%), lithium (49%), magnesium (42%), manganese (37%), mercury (33%), nickel (47%), potassium (35%), uranium (137%), vanadium (32%), zinc (35%), and zirconium (37%) were also above the project QC limits. The LCS recovery for silicon (8%) was also outside the QC limits but within limits for other metals. No further qualification has been applied, but all metals results should be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the matrix spike duplicate (MSD) recovery for 2,4-dinitrophenol (36%) was below the QC limit. No further qualification has been applied, but 2,4-dinitrophenol results for field samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the isotopic uranium analysis, due to the lack of LCS analysis, all uranium-235 may be considered estimated; no further qualification has been applied. Estimated data are usable for decision-making purposes.

SDG JP1046

This SDG is comprised of 13 verification soil samples (J1V915 through J1V927). Samples J1V924 and J1V927 comprise a field duplicate pair. These samples were collected on June 16, 2016, and analyzed for gamma-emitting radionuclides, uranium isotopes, metals, mercury, PCBs, SVOCs, and TPH. Minor deficiencies are as follows.

In the metals analysis, the MS recoveries for antimony (55%), copper (69%), silicon (30%), tin (68%), and vanadium (63%) were below the project QC limits. The RPD value for the laboratory duplicate for antimony (52%) was also above the QC limit. The LCS recovery for silicon (15%) was also outside the QC limits. No further qualification has been applied, but associated field sample results for antimony, copper, silicon, and vanadium may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the MS and MSD recoveries for 2,4-dinitrophenol (36% and 42%, respectively) were below the QC limit. No further qualification has been applied, but 2,4-dinitrophenol results for field samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the isotopic uranium analysis, due to the lack of LCS analysis, all uranium-235 may be considered estimated; no further qualification has been applied. Estimated data are usable for decision-making purposes.

SDG JP1047

This SDG is comprised of 13 verification soil samples (J1V902 through J1V914) and one equipment blank (J1V901). Samples J1V902 and J1V914 comprise a field duplicate pair. These samples were collected on June 16, 2016, and analyzed for gamma-emitting radionuclides, uranium isotopes, metals, mercury, PCBs, SVOCs, and TPH. Minor deficiencies are as follows.

In the metals analysis, the MS recoveries for antimony (45%) and silicon (17%) were below the project QC limits. The LCS recovery for silicon (26%) was also outside the QC limits. No further qualification has been applied, but associated field sample results for antimony and silicon may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the MSD recovery for 2,4-dinitrophenol (46%) was below the QC limit. No further qualification has been applied, but 2,4-dinitrophenol results for field samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the isotopic uranium analysis, due to the lack of LCS analysis, all uranium-235 may be considered estimated; no further qualification has been applied. Estimated data are usable for decision-making purposes.

SDG XP0226

This SDG is comprised of two soil samples (J1V8K2 and J1V8K3) collected as splits of samples J1V8F8 and J1V8J1, respectively. These samples were analyzed for gamma-emitting radionuclides, uranium isotopes, metals, mercury, PCBs, SVOCs, and TPH. Minor deficiencies are as follows.

In the SVOC analysis, the LCS recoveries for 2,4-dinitrophenol (26%), 2-methyl-4,6-dinitrophenol (46%), and hexachlorocyclopentadiene (47%) were below the QC limit. The MS and MSD recoveries for 2,4-dinitrophenol (43% and 38%, respectively) and the MSD recovery for 3,3'-dichlorobenzidene (37%) and hexachloropentadiene (40%) were below the QC limit. No further qualification has been applied, but associated results for field samples for the identified SVOCs may be considered estimated. Estimated data are usable for decision-making purposes.

In the isotopic uranium analysis, due to the lack of LCS analysis, all uranium-235 may be considered estimated; no further qualification has been applied. Estimated data are usable for decision-making purposes.

SDG XP0229

This SDG is comprised of two soil samples (J1V928 and J1V929) collected as splits of samples J1V902 and J1V924, respectively. These samples were analyzed for gamma-emitting radionuclides, uranium isotopes, metals, mercury, PCBs, SVOCs, and TPH. Minor deficiencies are as follows.

In the metals analysis, the MS recovery for silicon (0%) was below the QC limit. The post-digested spike recovery (91.4%) met QC limits. No further qualification has been applied, but associated field samples may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the LCS recoveries for 2,4-dinitrophenol (26%) and hexachlorocyclopentadiene (43%) were below the QC limit. The MS and MSD recoveries for 2,4-dinitrophenol (15% and 10%, respectively), 3,3'-dichlorobenzidene (44% and 31%, respectively), and hexachloropentadiene (35% and 28%, respectively) were below the QC limit. No further qualification has been applied, but associated results for field samples for the identified SVOCs may be considered estimated. Estimated data are usable for decision-making purposes.

In the isotopic uranium analysis, due to the lack of LCS analysis, all uranium-235 may be considered estimated; no further qualification has been applied. Estimated data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

Relative percent difference evaluations of primary samples versus laboratory duplicates are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance (QA)/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Field QA/QC samples

listed in the field logbook (WCH 2016a) are shown in Table B-1. The complete primary and QA/QC sample results are presented with the calculations in Appendix A.

Table B-1. Field Quality Assurance/Quality Control Samples.

Sample Location	Primary Sample	Duplicate Sample	Split Sample
ESA1-7	J1V8F8	J1V8H4	J1V8K2
ESA2-3	J1V8J1	J1V8K1	J1V8K3
WSA1-1	J1V902	J1V914	J1V928
WSA2-10	J1V924	J1V927	J1V929

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. Split samples are collected to provide a relative measure of the variability in the sampling, sample handling, and analytical techniques used by commercial laboratories. Field duplicates and splits are evaluated by calculating the RPD of the primary/duplicate or primary/split pair for each analyte. Relative percent differences are not calculated for analytes that are not detected in both the main and duplicate sample at more than five times the target detection limit. Relative percent differences of analytes detected at low concentrations (less than five times the detection limit) are not considered to be indicative of the analytical system performance. The calculation brief in Appendix A provides details on duplicate pair RPD calculation.

The RPD calculations for the field duplicate and split samples at ESA1-7 were above the QC criterion (30%) for aluminum (61.4% and 50.2%), barium (66.8% and 66.7%), calcium (65.1% and 64.6%), copper (74.2% and 79.6%), iron (63.4% and 75.4%), magnesium (60.3% and 68.1%), manganese (64.4% and 67.9%), sodium (61.8% and 60.9%), vanadium (64.6% and 86.7%), and zinc (60.8% and 85.1%). The RPD calculation for the field split sample at ESA1-7 for silicon (49.2%) was also above the QC criterion. In inspection of the associated sample data, the field duplicate and split sample results show good agreement except for silicon, and suggest that the primary sample results may be biased low. Data for associated metals may be considered estimated, but are usable for decision-making purposes.

The RPD calculations for the field duplicate sample at ESA2-3 were above the QC criterion for aluminum (32.6%), copper (34.5%), magnesium (31.4%), silicon (41.7%), and strontium (31.4%). The RPD calculations for the field split sample at ESA2-3 were above the QC criterion for potassium-40 (38.5%), copper (36.8%), silicon (106.7%), and zinc (37.8%). All RPD calculations for the field duplicate and split samples at WSA1-1 and WSA2-10 were below the QC criterion with the exception of the field split result for silicon at WSA2-10 (45.1%). These elevated RPD values are attributable to natural heterogeneities in the sample matrix.

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 300-288:2 waste site verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for the 300-288:2 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. The analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in a Washington Closure Hanford project-specific database prior to being submitted for inclusion in the Hanford Environmental Information System database. The verification sample analytical data are also summarized in Appendix A.

REFERENCES

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

DOE-RL, 2014, *300 Area Remedial Action Sampling and Analysis Plan*, DOE/RL 2001-48, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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WCH, 2016a, *D4 Waste Site Miscellaneous Sampling*, Logbook EL-1663-08, pp. 59 - 67, Washington Closure Hanford, Richland, Washington.

WCH, 2016b, *Work Instruction for Verification Sampling of the 300-288:2, Undocumented Disposal Site Within Gravel Pit 6 Subsite,* 0300X-WI-G0060, Rev. 1, Washington Closure Hanford, Richland, Washington.

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