

APPENDIX E

DATA QUALITY ASSESSMENT

(See Attached CD for Complete File)

attached to: 0079362

003365

APPENDIX B

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(See Attached CD for Complete File)

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CONFIRMATORY SAMPLING

A data quality assessment (DQA) was performed to compare the sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (BHI 2004). This DQA was performed in accordance with site specific data quality objectives found in the Sampling and Analysis Plan (SAP) (DOE-RL 2005b).

A review of the sample design (BHI 2004), the field logbooks (BHI 2005a, b), and applicable analytical data packages has been performed as part of this DQA. All samples were collected per the sample design.

To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical and radiochemical analyses (BHI 2000a, b) 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 2000).

The confirmatory sampling approach for the 100-F-26:9 waste site included a sample design with multiple subunit areas. Confirmatory sample data collected at the 100-F-26:9 waste site were provided by the laboratories in multiple sample delivery groups (SDGs). No major deficiencies were found in the analytical data set or supporting documentation. Minor deficiencies are discussed by SDG below.

SDG H2937

SDG H2937 consists of 10 field samples (J025J1 – J025J9, J025K0). This SDG was submitted for third-party validation. No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, the relative percent difference (RPD) reported on the laboratory duplicate is 47.6%. Both the initial result and the duplicate result are near the detection limit with the initial result being undetected. Evaluation of RPDs near the detection limit is problematic. Third-party validation did not assign any qualifiers for this result. The data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the required quantitation limit (RQL) (0.5 mg/kg) was exceeded for all undetected samples. Most of these are inconsequential because the reported detection limits remain below the lowest applicable remedial action goal (RAG) (2.0 mg/Kg). Sample J025J1 required a 100 fold dilution and is reported as undetected at 33.9 mg/Kg. This sample was collected from service area 10; which has subsequently been remediated and sampled for verification purposes. Hexavalent chromium was retained as a contaminant of concern (COC) for verification sampling. Third-party validation did not assign any qualifiers for these results. The data are useable for decision-making purposes.
- In the polychlorinated biphenyls (PCB) analysis, sample J025J1 required a 10 fold dilution. The RQL was exceeded for all undetected analytes in sample J025J1. The sample area has been

subsequently remediated and sampled for verification purposes. PCBs were retained as COCs for verification sampling. Third-party validation did not assign any qualifiers for this result. The data are useable for decision-making purposes.

- In the inductively coupled plasma (ICP) metals analysis, the matrix spike (MS) recovery for antimony is below the acceptance criteria (70-130%) at 64.4%. Third-party validation qualified all of the antimony data in SDG K2937 as estimated with "J" flags. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recovery for zinc was above the acceptance criteria (70-130%) at 133.9%. Third-party validation qualified all of the zinc data in SDG K2937 as estimated with "J" flags. Estimated data are useable for decision-making purposes.
- In the gamma spectroscopy analysis, the RPD reported for radium-228 and thorium-232 are both above the acceptance criteria (less than 30%) at 48%. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Third-party validation qualified all of the radium-228 and thorium-232 results in SDG H2937 as estimates with "J" flags. Estimated data are useable for decision-making purposes.
- In the semivolatile organic compounds (SVOC) analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the method blank (MB). There is no impact on the field sample data because MB result is more than 20 times less than the field sample results for bis(2-ethylhexyl)phthalate. Third-party validation did not assign any qualifiers for this result. The data are useable for decision-making purposes.

SDG H2938

SDG H2937 consists of one field sample (J025P9). No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the PCB analysis, the results are reported as undetected with practical quantitation limits (PQLs) above the RQLs and above the RAG concentrations by a small margin. Analytical data is routinely reported below the PQL and qualified by the laboratories estimate. If PCB were present at the RAG concentrations they would have been detected and reported. The data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the result for sample J025P9 is reported as undetected at 35.6 mg/Kg, which is above the soil RAG for this analyte. The nature of the sample matrix (vitrified clay pipe) has impacted the PQL for hexavalent chromium. This analysis was only run because of a laboratory error. Hexavalent chromium was not indicated in the work instruction for sample J025P9. This result has no impact on other field sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the analyte chromium was detected in the MB. The chromium result for sample J025P9 is less than 20 times the MB result. The chromium result for sample J025P9 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the MS result for eight analytes (aluminum, barium, calcium, iron, manganese, lead, silicon, zinc) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run post-digestion spikes (PDSs) and serial dilutions for these analytes. The PDS results for all but the lead were in the range of 82.4% to 105.6% and are within the acceptance criteria. The PDS result for lead is 68.3%. The lead result for sample J025P9 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the RPDs calculated for eight analytes (arsenic, 34.1%; barium, 88.0%; cobalt, 30.7%; copper, 39.1%; iron, 31.3%; magnesium, 44.5%; manganese, 75.4%; lead, 188.3%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes in sample J025P9 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG H2945

SDG H2945 consists of one field sample (J025K6). No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the PCBs analysis, an interference prevented recovery of the MS and matrix spike duplicate (MSD) for aroclor-1260. The MB and laboratory control sample (LCS) are within the acceptance criteria for all analytes including aroclor-1260. The aroclor-1260 result for sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for 14 analytes (silver, aluminum, barium, cadmium, chromium, copper, iron, nickel, lead, antimony, silicon, zinc, calcium, mercury) are outside of the laboratory acceptance criteria (75-125%). To verify quantitation, the laboratory has run PDSs and serial dilutions on all but the calcium and mercury. The PDS results were acceptable falling in the range of 89.5% to 121.2%. For mercury a serial dilution was performed with acceptable results. For all but the antimony the initial MS addition was insignificant compared to the native concentrations in the sample from which the MS was prepared (J025K6). Based on the original MS result, antimony may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD calculated for lead is above the acceptance criteria (less than 30%) at 73%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for lead in sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the total petroleum hydrocarbon (TPH) analysis, the MS recovery for TPH was below the acceptance criteria. The added spike concentration was small compared to the native concentration of TPH in sample J025K6. The TPH result in sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the gross alpha analysis, the RPD calculated for gross alpha is above the acceptance criteria (less than 30%) at 53%. Elevated RPDs in environmental samples are attributed to natural heterogeneities

in the sample matrix. The analytical results for gross alpha in sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the gamma spectroscopy analysis, the RPDs reported for potassium-40 and radium-226 are above the acceptance criteria (less than 30%) at 42% and 37%, respectively. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. The analytical results for potassium-40 and radium-226 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG H2950

SDG H2950 consists of eight field samples (J025K1 – J025K5, J026D1, J026D2, J026D4). No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the ICP metals analysis for sample J026D4, the MS result for five analytes (aluminum, iron, manganese, antimony, silicon) are outside of the laboratory acceptance criteria (75-125%). To verify quantitation, the laboratory has run PDSs and serial dilutions on these analytes. The PDS results were acceptable falling in the range of 92.5% to 107.5%. For all but the antimony, the initial MS addition was insignificant compared to the native concentrations in the sample from which the MS was prepared. Based on the original MS result, antimony may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis for all of the samples in SDG H2950 except sample J026D4, the MS result for seven analytes (aluminum, calcium, iron, manganese, antimony, silicon, zinc) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation the laboratory has run PDSs and serial dilutions. The PDS results were in the range of 78.5% to 113.3% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis for all of the samples in SDG H2950, except sample J026D4 which was run separately, the RPDs calculated for eight analytes (boron, 50%; cadmium, 71.1%; iron, 35.1%; manganese, 33.9%; sodium, 35.4%; lead, 45.2%; selenium, 43.4%; zinc, 45.5%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the internal standard criteria were not met for samples J025K1, J026D2, and the MS and MSD samples, which were prepared from sample J026D2. Analysis of the MS and MSD fulfills the reanalysis requirement of sample J026D2. Sample J025K1 was reanalyzed with similar results. All of the surrogate recoveries were within criteria. The SVOC data in samples J025K1 and J026D2 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG H2972

SDG H2972 consists of two soil samples (J02D75, J02D76). No major deficiencies were found in this SDG. Minor deficiencies are as follows.

- In the gross beta analysis, the RPD calculated for the laboratory duplicate was above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for gross beta may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the MB (.044 mg/kg) and in the field samples (.055mg/kg, .084 mg/kg) all at similar concentrations. The field sample results may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, potassium was detected in the MB and in all of the field samples at similar concentrations. Potassium is not a contaminants of potential concern (COPC) for this waste site. The field sample concentrations reported for potassium in samples J02D75 and J02D76 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS result for silicon was below the acceptance criteria (70-130%) at 68%. Silicon is not a COPC for this waste site. The field sample concentrations reported for silicon in samples J02D75 and J02D76 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for six analytes (aluminum, calcium, iron, antimony, silicon, mercury) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation the laboratory has run a serial dilution for mercury and PDSs and serial dilutions for the other analytes, all with good results. The PDS results were in the range of 78.9% to 97.5% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD results for three analytes (molybdenum, 55.3%; antimony, 43.9%; silicon 55.6%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these three analytes in sample SDG H2972 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG 2975

SDG H2975 consists of three samples (J025K8, J025K9, J025L0) of vitrified clay pipe. No major deficiencies were found in this SDG. Minor deficiencies are as follows.

- In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected below the contract required quantitation limit (CRQL) in the MB (.044 mg/kg) and field samples (0.067mg/kg - 0.330 mg/kg). The field sample results may be considered estimated. Estimated data are useable for decision making-purposes.
- In the PCB analysis, sample J025K8 required a 10 fold dilution due to a high concentration of aroclor-1254. The other analytes were reported as non-detected with high MDLs due to the dilution.

The analytical results for PCBs, other than aroclor-1254, may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, potassium was detected in the MB and in all of the field samples at similar concentrations. Potassium is not a COPC for this waste site. The field sample concentrations reported for potassium in samples J025K8, J025K9, and J025L0 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS result for silicon was below the acceptance criteria (70-130%) at 68%. Silicon is not a COPC for this waste site. The field sample concentrations reported for silicon in samples J025K8, J025K9, and J025L0 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for seven analytes (aluminum, calcium, chromium, iron, lead, silicon, mercury) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run serial dilutions for mercury, PDSs, and other analytes, all with good results. The PDS results were in the range of 77% to 97.5% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD results for four analytes (silver, 73.8%; boron, 34.3%; potassium, 63.1%; magnesium, 39.3) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these four analytes in sample SDG H2975 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the TPH, the RPD calculated for TPH is above the acceptance criteria (less than 30%) at 89.4%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these three samples in SDG H2975 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG W04485

SDG W04485 consists of sample J025L8, analyzed for hexavalent chromium. No major or minor deficiencies were found in SDG W04485. The data are useable for decision-making purposes.

SDG W04503

SDG W04503 consists of two samples (J02DD6, J02DD7) of vitrified clay pipe. No major deficiencies were found in SDG W04503. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, sample J02DD6 exceeded the hold time (24 hours) by less than three hours. There is no impact on the sample data. The data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the MS and MSD results were below the acceptance criteria (70-130%) at 26.3% and 19.1%, respectively. A post digestion matrix spike was run with better

results (65%) but still below the acceptance criteria. The laboratory commented that these results appear to be a matrix effect. The results are not low enough to cause the data to be rejected. Hexavalent chromium results for samples J02DD6 and J02DD7 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG W04495

SDG W04495 consists of one sample (J025M4) of vitrified clay pipe. No major deficiencies were found in SDG W04495. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, the MS and MSD recoveries are below the acceptance criteria (70-130%) as 59% and 49%, respectively. A post digestion matrix spike (75%) indicated a possible matrix effect. The LCS recovery (101%) was within criteria. The hexavalent chromium result for sample J025M4 may be considered estimated. Estimated data are useable for decision-making purposes.

Confirmatory Data Quality Assessment Summary

Limited, random, or sample matrix-specific influenced batch quality control (QC) issues, such as those discussed above, are a potential for any analysis. The number and types seen in these data sets are within expectations for the matrix types and analyses performed. The DQA review of the 100-F-26:9 confirmatory sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for 100-F-26:9 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. Detection limits, precision, accuracy, and sampling data group completeness were assessed to determine if any analytical results should be qualified as a result of quality assurance (QA) and QC deficiencies. The analytical data were found acceptable for decision-making purposes. The confirmatory sample analytical data are stored in the Environmental Restoration (ENRE) project-specific database prior to being submitted for inclusion in the Hanford Environmental Information System (HEIS) database. The confirmatory sample analytical data are also summarized in Appendix B.

VERIFICATION SAMPLING

A 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 designs (DOE-RL 2005, WCH 2008). This DQA was performed in accordance with site-specific data quality objectives found in the SAP (DOE-RL 2005).

A review of the sample design (WCH 2008), field logbooks (WCH 2007a, 2007b), and applicable analytical data packages has been performed as part of this DQA. All samples were collected per the sample design. To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical and radiochemical analysis (BHI 2000a, 2000b) are used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., decision-making purposes). The DQA completes the data life cycle

(i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2000).

Verification sample data collected at the 100-F-26:9 waste site were provided by the laboratories in nine SDGs: SDG K0705, SDG K0709, SDG K0710, SDG K0712, SDG K1108, SDG K1118, SDG K1120, SDG K1121, and SDG K1123. SDG 1121 was submitted for third-party validation. No major deficiencies were found in the SDGs. Minor deficiencies are discussed by SDG as follows below. Unless otherwise noted, deficiencies listed below are specific to the individual SDG, but apply to all samples within that SDG.

SDG K0705

This SDG comprises four field samples (J14JT0 – J14JT3) collected from the 100-F-26:9 pipeline road cross excavation. These samples were analyzed for ICP metals, mercury, SVOCs, PCBs, TPH, hexavalent chromium, gross alpha, gross beta, and by gamma spectroscopy. The ICP metals, mercury, SVOCs, PCBs, TPH, and hexavalent chromium analyses were performed in two batches, one for samples J14JT0 – J14JT2 and one for sample J14JT3. No major deficiencies were found in SDG K0705. Minor deficiencies are as follows.

- In the SVOC analysis for both analytical batches in SDG K0705, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the method blank (MB). The sample bis(2-ethylhexyl) phthalate results may be considered estimated. Estimated data are useable for decision-making purposes.
- Surrogate recoveries in the SVOC analysis are outside the initial criterion, with high results, for samples J14JT1 and J14JT2. However, the samples meet the secondary criterion for surrogate recoveries, as there is no more than one outlier for each sample. The data are acceptable for decision-making purposes.
- In the SVOC analysis for samples J14JT0-J14JT2, the bis(2-chloroethoxy)methane MS and MSD recoveries are both 49%, below the acceptance criteria. The 1,2,4-trichlorobenzene MS and MSD recoveries are below the acceptance criteria at 53% and 56%, respectively. The MS recoveries for 1,3-dichlorobenzene and hexachloroethane are both 49%. The 2,2'-oxybis(1-chloropropane) MS and MSD recoveries are both 44%, and the 2,4-dimethylphenol MS and MSD recoveries are 48% and 45%, respectively. The sample results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis for samples J14JT3, the 1,2,4-trichlorobenzene MS and MSD recoveries are below the acceptance criteria at 50% and 54%, respectively. The MS recoveries for 4-chloro-3-methylphenol and 2-methylnaphthalene are 58% and 59%, respectively. The sample J14JT3 results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- The sample spike was not added to the LCS sample for many of the SVOC analyses for samples J14JT0-J14JT2. Due to lack of a LCS analysis for 69 of the 192 SVOC analyses, all results for analytes with low LCS recoveries are considered estimated for samples J14JT0-J14JT2. Estimated

data are useable for decision-making purposes.

- In the PCB analyses for samples J14JT0-J14JT2, the surrogate recovery for the samples were all within the QC limits, however, the MS/MSD and LCS samples were given a second surrogate solution spike instead of a sample spiking solution. Therefore, due to lack of a MS, MSD, or LCS analysis for the PCBs, all PCB data for samples J14JT0-J14JT2 are considered estimated. Estimated data are acceptable for decision-making purposes.
- In the ICP metals analysis for samples J14JT0-J14JT2, the MS recoveries for three ICP metals (aluminum, iron, and antimony) are out of project acceptance criteria. For aluminum and iron, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post digestion spikes and serial dilutions were prepared for each analyte with results ranging between 98.8-105.5%. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 54.0%. The antimony data for samples J14JT0-J14JT2 are considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis for sample J14JT3, the MS recoveries for five ICP metals (aluminum, iron, manganese, antimony, and silicon) are out of project acceptance criteria. For most of these analytes, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post digestion spikes and serial dilutions were prepared for each analyte with results ranging between 98.2-103.0%. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 49.1%. The antimony data for sample J14JT3 is considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria at 10% for samples J14JT0-J14JT2, and 15.5% for sample J14JT3. The silicon data for SDG K0705 is considered estimated. Estimated data are useable for decision-making purposes.

SDG K0709

This SDG comprises one field samples (J14JT4) collected from the 100-F-26:9 pipeline road crossing excavation. This sample was analyzed for ICP metals, mercury, SVOCs, PCBs, TPH, hexavalent chromium, gross alpha, gross beta, and by gamma spectroscopy. No major deficiencies were found in SDG K0709. Minor deficiencies are as follows.

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

were prepared for all four analytes with acceptable results. The data are useable for decision-making purposes.

- The RPD calculated for arsenic (32.3%) in the laboratory duplicate pair are above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to heterogeneities in the sample matrix and not to deficiencies in the laboratory procedures. The data are useable for decision-making purposes.
- In the SVOC analysis, the common laboratory contaminants bis(2-ethylhexyl)phthalate are detected in the MB. The sample bis(2-ethylhexyl)phthalate results may be considered estimated. The data are useable for decision-making purposes.
- A surrogate recovery in the SVOC analysis is outside the initial criterion, with a low result. However, the sample meets the secondary criterion for surrogate recoveries, as there is no more than one outlier for the sample. The data are acceptable for decision-making purposes.
- In the SVOC analysis, the bis(2-chloroethoxy)methane MS and MSD recoveries are both 49%. The MS recovery for 2-nitroaniline is 58%. The 2,2'-oxybis(1-chloropropane) MS and MSD recoveries are 44% and 43%, respectively. These MS and MSD recoveries are below acceptance criteria. The sample results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- The sample spike was not added to the LCS sample for the SVOC analyses for SDG K0709. Due to lack of a LCS analysis, all SVOC results are considered estimated. Estimated data are useable for decision-making purposes.

SDG K0710

This SDG comprises one field sample (J14JT7) collected from the 100-F-26:9 pipeline spill. This sample was analyzed for ICP metals, mercury, hexavalent chromium, and TPH. No major deficiencies were found in SDG K0710. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, MS recovery is out of project acceptance criteria. The spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. The hexavalent chromium data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recoveries for six ICP metals (aluminum, chromium, iron, manganese, antimony, and silicon) are out of project acceptance criteria. For most of these analytes, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions were prepared for all three analytes with acceptable results. Antimony did not have mismatched spike and native concentrations in the original MS. The original

MS recovery for antimony was 47.7%. The antimony data for SDG K0710 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria at 15.5%. The silicon data for SDG K0710 may be considered estimated. Estimated data are useable for decision-making purposes.

SDGK0712

SDG K0712 comprises two field samples (J13W57, J14JT5). Both samples are soil. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, SVOCs, total petroleum hydrocarbon, gross alpha and gross beta by proportional counting, and by gamma spectroscopy. No major deficiencies were found in SDG K0712. Minor deficiencies are as follows.

- In the gross alpha analysis, the RPD reported for the laboratory duplicate is above the acceptance criteria (less than 30%) at 87%. Elevated RPDs calculated for environmental soils are generally attributed to natural heterogeneities in the sample matrix. The gross alpha results for samples J13W57 and J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the gamma spectroscopy analysis, the RPDs calculated for three analytes (radium-226, 67%; radium-228, 88%; thorium-232, 88%) are above the acceptance criteria (less than 30%). Elevated RPDs calculated for environmental soils are generally attributed to natural heterogeneities in the sample matrix. The radium-226, radium-228, and thorium-232 results for samples J13W57 and J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the recoveries for seven, out of a total of 54, surrogates are outside the range of the acceptance criteria. The sample (J13W57) was re-extracted and analyzed. Surrogates in the resulting analysis are all within the acceptance criteria. The laboratory concluded that the original run suffered from losses during the extraction. The second run will be retained for evaluation purposes. The data are useable for decision-making purposes.
- In the SVOC analysis, the MB contained the common laboratory contaminant bis(2_ethylhexyl)phthalate at a concentration below the CRQL. There is no significant impact on the field sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria (70-130%) at 14.1%. Silicon is not a COPC for the 100-F-26:9 waste site. The silicon data for samples J13W57 and J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recoveries for four analytes (aluminum, iron, antimony, silicon) are outside of the acceptance criteria. To confirm quantitation the laboratory has run serial dilutions and PDSs, all with good results. The PDS results were in the range of 96.5% to 98.3% and are within the acceptance criteria. The data are useable for decision-making purposes.

- In the ICP metals analysis, the RPD result, associated with sample J14JT5, for 1 analyte (silicon, 37.8%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for silicon in sample J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG K1108

SDG K1108 comprises four field samples (J16947 – J16950). All are soil samples. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, gross alpha and gross beta by proportional counting, and by gamma spectroscopy. No major deficiencies were found in SDG K1008. Minor deficiencies are as follows.

- In the gross alpha analysis, the RPD calculated for gross alpha in the laboratory duplicate is above the acceptance criteria (less than 30%) at 47%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for gross alpha in samples J16947 through J16950 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the recoveries for five, out of a total of 48, surrogates are outside the range of the acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per fraction [acid and base neutral] and no recoveries less than 10%). The data are useable for decision-making purposes.
- In the SVOC analysis, the MS recoveries for two analytes (di-n-octyl phthalate 163%, benzo(b) fluoranthene 132%) are above the acceptance criteria (70-130%). The analytical results for di-n-octyl phthalate and benzo(b) fluoranthene in samples J16947 through J16950 may be biased high. High biased data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recoveries for two analytes (2,4-dinitrophenol, 19%; 4,6-dinitro-2-methylphenol, 25%) are below the acceptance criteria (70-130%). Analytical recoveries above 10% alone do not require rejection of the associated data. Quantitation of the field samples is confirmed by the recoveries of these analytes in the MS and MSD, which are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the initial calibration blank (0.019 mg/kg) and one of the continuing calibration blanks (0.014 mg/kg) are above the limit of quantitation. However, the results are small enough that there is no significant impact on the field sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the MB result for sodium is above the limit of quantitation, and all of the field sample results are less than 20 times the MB concentration. Sodium is not a COPC for the 100-F-26:9 waste site. The sodium results for samples J16947 through J16950 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the MS result for five analytes (aluminum, iron, manganese, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results were in the range of 91.4% to 103.6% and are within the acceptance criteria. The data are useable for decision making-purposes.
- In the ICP metals analysis, the RPD result for one analyte (boron, 44.4%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for boron in samples J16947 through J16950 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG K1118

SDG K1118 comprises 10 field samples (J16951 – J16960). All are soil samples. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, gross alpha, and gross beta by proportional counting, and by gamma spectroscopy. No major deficiencies were found in SDG K1118. Minor deficiencies are as follows.

- In the gross beta analysis, the initial result for gross beta in sample J16951 was high enough to trigger reanalysis and analysis for strontium. The RPD calculated for gross beta in the second laboratory duplicate is above the acceptance criteria (less than 30%) at 34%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for gross beta in sample J16951 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, sample J16951 and the MS/MSD pair prepared from sample J16951 were not concentrated to the usual final concentration due to the nature of the extract. This has the same effect as a dilution. The PQLs in these samples have been elevated to reflect an eight fold dilution. As is demonstrated by the detection of bis(2-ethylhexyl)phthalate, the analytes are still detectable well below the calculated PQLs. The source of this deficiency appears to be the nature of the matrix in sample J16951. All data for sample J16951 may be considered estimated. The other field sample data does not appear to be impacted. The data are useable for decision-making purposes.
- In the SVOC analysis, the recoveries for four, out of a total of 84, surrogates are outside the range of the acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per fraction [acid and base neutral] and no recoveries less than 10%). The data are useable for decision-making purposes.
- In the SVOC analysis, the MS recoveries for 25 analytes, out of a total of 128, are outside the acceptance criteria. The MS/MSD pair was prepared from sample J16951. As was mentioned above, the nature of the matrix in sample J16951 has impacted this analysis. This effect is limited to sample J16951 and the MS/MSD pair. All data for sample J16951 may be considered estimated. There is no impact on the other field sample data. The data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recoveries for four analytes (2,4-dimethylphenol, 46%; 1,2,4-trichlorobenzene, 55%; 4-chloro-3-methylphenol, 59%; 2-methylnaphthalene, 57%), out of a total of

64, are below the acceptance criteria (70-130%). The analytical results for 2,4-dimethylphenol, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, and 2-methylnaphthalene, in samples J16951 through J16960, may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the MB result for sodium is above the limit of quantitation. The sodium concentrations in samples J16953, J16954, J1697, and J16959 are less than 20 times the MB concentrations. Sodium concentrations reported in these samples may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for four analytes (aluminum, copper, iron, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results were in the range of 88.5% to 102.8% and are within the acceptance criteria. The data are useable for decision-making purposes.

SDG K1120

SDG K1120 comprises 11 field samples (J16961 – J16971). All are soil samples. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, chlorinated pesticides, gross alpha, gross beta, and by gamma spectroscopy. No major deficiencies were found in SDG K1120. Minor deficiencies are as follows.

- In the gross alpha analysis, the RPD reported is above the acceptance criteria (less than 30%) at 38%. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for gross alpha in SDG K1120 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the gross beta analysis, several of the original gross beta results were elevated, and inconsistent with the gamma spectroscopy results. These irregularities were traced back to the sample preparation and analysis methodology. In instances without a clear explanation of the data, the laboratory is asked to rerun samples. All of the samples in SDG K1120 were reanalyzed for gross beta. Evaluation of the second set of gross beta results found them to be consistent with the gamma spectroscopy, and is therefore believed to be more representative of the samples. The laboratory reissued SDG K1220 with the updated results. The reissued (final) data set appears in the various calculations and tables produced for the 100-F-26:9 waste site. The data are useable for decision-making purposes.
- In the gamma spectroscopy analysis, the RPDs reported for radium-228 (44%) and thorium-232 (44%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for radium-228 and thorium-232, in SDG K1120, may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, sample J16970 was extracted and analyzed twice. The first analysis found all of the surrogate recoveries to be unacceptable, in the range of 4% to 7%. In the second analysis all of the surrogates are acceptable. However, the second extraction and analysis were performed

outside of the hold time. An evaluation of the results from both analyses found almost identical results for the target analytes, they are all non-detect. Although the data are exactly the same, the second run will be used for data evaluation. The second analysis was run within two times the hold time and from a data quality perspective is the better data. All data reported for sample J16970 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the SVOC analysis, the MS/MSD recoveries for 21 analytes were outside of the acceptance criteria. All 21 of these deficiencies were reported in the MS. The MSD results were all within the acceptance criteria. Surrogates from the MS were also a low, but within criteria. This deficiency appears to be limited to the MS. The field sample data are not impacted. The data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recoveries for 8 analytes (nitrobenzene, 47%; isophorone, 54%; 2,4-dimethylphenol, 49%; 1,2,4-trichlorobenzene, 53%; 2-methylnaphthalene, 57%; 2,4-dinitrophenol, 18%; 4,6-dinitro-2-methylphenol, 26%; bis(2-ethylhexyl)phthalate, 179%), are outside the acceptance criteria (70-130%). The analytical results for these results in samples J16961 through J16971 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the chlorinated pesticide analysis, the analyte toxaphene was not included in the MS, MSD, or LCS samples. Toxaphene is actually a mixture of compounds rather than a discrete analyte. While the overall concentration of toxaphene can be calculated using several unobstructed peaks in the chromatography, the inclusion of toxaphene in the spiking mixture would be problematic for the other pesticide analytes. The laboratory typically quantitates toxaphene but does not include toxaphene in QA/QC samples. The toxaphene data is therefore considered estimated. Estimated data are useable for decision-making purposes.
- In the PCB analysis, one of the surrogates (tetrachloro-m-xylene) in sample J16966 recovered high at 176%. However, this result meets the surrogate acceptance criteria which allow one outlier per sample. The high surrogate recovery may indicate a high bias in the analytical results for sample J16966. High biased data are useable for decision-making purposes.
- In the ICP metals analysis, the initial MS extract was lost (laboratory error) during extraction. The MS was replaced in a separate batch. The LCS confirms quantitation for the initial batch and the replacement MS confirms quantitation for the sample matrix. However, because the reported MS was prepared in a separate batch from the field samples, all of the ICP metals data reported in SDG K1120 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria (70-130%) at 7.6%. Poor recovery is common for silicon. Silicon is not a COPC for the 100-F-26:9 waste site. All of the silicon data reported in SDG K1120 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for seven analytes (aluminum, calcium, iron, magnesium, manganese, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results

were in the range of 91.5% to 111.9% and are within the acceptance criteria. The data are useable for decision-making purposes.

- In the ICP metals analysis, the RPD result for one analyte (arsenic, 47.6%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for arsenic in samples J16961 through J16971 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the RPD result for hexavalent chromium is above the acceptance criteria (less than 30%) at 75.3%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The data are useable for decision-making purposes.

SDG K1121

This SDG comprises five field samples (J169W9, J169X0, J169X1, J16945, and J16946). These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, TPH, SVOCs, gross alpha and gross beta by proportional counting, and by gamma spectroscopy. SDG K1121 was submitted for formal third-party validation. No major deficiencies were found. Minor deficiencies found in SDG K1005 are as follows.

- In the radiochemical analysis, the RPD calculated for thorium-232 (36%) in the laboratory duplicate pair are above the acceptance criteria of 30%. The results for this analyte were qualified as estimates and flagged "J" by third-party validation. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, antimony, and silicon) are out of project acceptance criteria. For aluminum and iron, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post digestion spikes and serial dilutions were prepared for each analyte with results ranging between 95.5-104.5%. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The antimony and silicon data for SDG K1121 were qualified as estimates and flagged "J" by third-party validation. Estimated data are useable for decision making-purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria at 17.2%. The silicon data for SDG K1121 were qualified as estimates and flagged "J" by third-party validation. Estimated data are useable for decision making-purposes.
- In the SVOC analysis, the MS and/or MSD are below QC limits for 18 analytes. The bis(2-chloroethyl)ether MS and MSD are 37% and 48%, respectively. The MS recoveries for 1,3-dichlorobenzene; isophorone; and 2-nitrophenol are all 44%. The MS recoveries for n-nitroso-di-n-propylamine; 1,4-dichlorobenzene; and 1,2-dichlorobenzene are 43%, 46%, and 48%, respectively. The MS recoveries for 2-methylphenol; 2,2'-oxybis(1-chloropropane); and 3,4-methylphenol are outside QC limits at 57%, 40%, and 58%, respectively. The MS recoveries for hexachloroethane; nitrobenzene; and 2,4-dimethylphenol are 41%, 37%, and 48%, respectively. The

MS recoveries for phenol; 1,2,4-trichlorobenzene; 4-chloro-3-methylphenol; 2-methylnaphthalene; and acenaphthylene are 47%, 46%, 56%, 53%, and 58%, respectively. The data for these analytes in SDG K1121 were qualified as estimates and flagged "J" by third-party validation. Estimated data are useable for decision-making purposes.

- In the SVOC analysis, LCS recoveries were outside QC limits for 20 analytes. The LCS recoveries for 2,4-dimethylphenol; naphthalene; and pentachlorophenol are all 46%. The LCS recoveries for n-nitroso-di-n-propylamine and isophorone are both 46%. The LCS recoveries for bis(2-chloroethyl)ether; 1,4-dichlorobenzene; and 2-methylphenol are 39%, 49%, and 54%, respectively.
- The LCS recoveries for 2,2'-oxybis(1-chloropropane); 3,4-methylphenol; and hexachloroethane are 37%, 59%, and 44%, respectively. The LCS recoveries for nitrobenzene; bis(2-chloroethoxy)methane; and 1,2,4-trichlorobenzene are 40%, 43%, and 52%, respectively. The LCS recoveries for 4-chloroaniline; 4-chloro-3-methylphenol; 2-methylnaphthalene; 2-nitroaniline; 2,4-dinitrophenol; and dinitro-2-methylnaphthalene are 31%, 57%, 54%, 59%, 21%, and 37%, respectively. The results for these analytes were qualified as estimates and flagged "J" by third-party validation. Estimated data are useable for decision-making purposes.
- The RPDs for the following SVOCs were outside QC limits: hexachloroethane, 33%; hexachlorocyclopentadiene, 38%; acenaphthylene, 30.6%; 3-nitroaniline, 30.9; 4-bromophenylphenylether, 31%; hexachlorobenzene, 31.8%; 3,3-dichlorobenzidine, 43%; and ideno(1,2,3-cd)pyrene, 30.2%. The results for these SVOCs were qualified as estimates and flagged "J" by third-party validation. Estimated data are useable for decision-making purposes.

SDG K1182

SDG K1182 comprises one field sample (J16M53), a soil sample. This sample was analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, chlorinated pesticides, gross alpha, and gross beta, and by gamma spectroscopy. No major deficiencies were found in SDG K1182. Minor deficiencies are as follows.

- In the gamma spectroscopy analysis, the RPDs reported for radium-228 (32%) and thorium-232 (32%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for radium-228 and thorium-232, in sample J16M53, may be considered estimated. Estimated data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the MS is evaluated for both soluble and insoluble hexavalent chromium. The predominant form of hexavalent chromium in environmental samples is the soluble form. The MS recovery for soluble hexavalent chromium is above the acceptance criteria (70-130%) at 163%. This result may indicate a high bias in the field sample data for sample J16M53. However, hexavalent chromium was reported as not detected in the sample. Therefore, there is no impact on the sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria (70-130%) at 19.9%. Poor recovery is common for silicon. Silicon is not a COPC for the 100-F-26:9 waste

site. All of the silicon data reported in SDG K1182 may be considered estimated. Estimated data are useable for decision-making purposes

- In the ICP metals analysis, the MS result for eight analytes (aluminum, barium, calcium, copper, iron, lead, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation the laboratory has run PDSs and serial dilutions for these analytes. With the exception of barium, the PDS results were in the range of 88.5% to 100.3% and are within the acceptance criteria. The PDS for barium was 65.7%. Barium results for sample J16M53 may be considered estimated. The data are useable for decision-making purposes
- In the ICP metals analysis, the RPD result for six analytes (arsenic, 33.3%; barium, 39.1%; copper 145.3%; molybdenum, 30.8%; silicon, 35.7%; zinc, 41%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes in sample J16M53 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the MS sample has slightly low, but within criteria, recoveries on all six of the surrogates. The MS recoveries for all of the analytes are also low with eleven results below the acceptance criteria. The MSD, LCS, and sample J16M53 do not show the same low surrogate recovery and the MSD, and LCS analyte recoveries are all within or above the acceptance criteria. The deficiency in the MS appears to be limited to the MS and is likely the result of an overall loss of material during the volume reduction step of the extraction process. Quantitation of the sample is verified by the MSD and the LCS. There is no impact on sample J16M53. The data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recovery for one analyte (4-nitrophenol, 166%) is above the acceptance criteria (70-130%). The LCS result could indicate a high bias in the 4-nitrophenol data. However, the MS and MSD recoveries are within the acceptance criteria and do not suggest high bias. High biased data are useable for decision-making purposes.
- In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the MB below the CRQL. Bis(2-ethylhexyl)phthalate was also detected at a similar concentration in the sample. Both results are below the applicable RAGs. The bis(2-ethylhexyl)phthalate result for sample J16M53 may be considered estimated. The data are useable for decision-making purposes.

SDG K1123

SDG K1123 comprises 11 field soil samples (J16934 – J16944), and 1 equipment blank (J16933). The field samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, chlorinated pesticides, gross alpha, gross beta, and by gamma spectroscopy. The equipment blank was analyzed for ICP metals, mercury, and SVOCs. No major deficiencies were found in SDG K1123. Minor deficiencies are as follows.

- In the gamma spectroscopy analysis, the RPD reported for radium-228 (33%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to

natural heterogeneity in the sample matrix. Sample data for radium-228, in SDG K1123, may be considered estimated. Estimated data are useable for decision-making purposes.

- In the SVOC analysis, five out of six surrogate recoveries in sample J16933, the equipment blank, were below the acceptance criteria. These results suggest a low bias in the data for sample J16933, which may be considered estimated. There is no impact on the field sample data. The data are useable for decision-making purposes.
- In the SVOC analysis, 31 out of 128 MS/MSD recoveries are below the acceptance criteria. Evaluation of these, and the analytes that are within criteria, shows that the overall trend for all of the analytes is toward low recoveries. All of the SVOC data in SDG K1123 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the RPD reported for hexavalent chromium is above the acceptance criteria (less than 30%) at 37.7%. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for hexavalent chromium, in SDG K1123, may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MB result for sodium is above the limit of quantitation, and all of the field sample results, with the exception of sample J16942, are less than 20 times the MB concentration.
- Also, the LCS recovery for sodium is below the acceptance criteria (70-130%) at 29.3%. Sodium is not a COPC for the 100-F-26:9 waste site. The sodium results for SDG K1123 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for five analytes (aluminum, calcium, iron, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results were in the range of 97.6% to 106.7% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD results for three analytes (aluminum, 40%; arsenic, 40%; mercury, 64.7%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes in SDG K1123 may be considered estimated. Estimated data are useable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

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

Field QA/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Two field duplicate samples, listed in the field logbooks (WCH 2007a, b), were collected. The main samples are J16943 and J16970; and the duplicate samples are J16944 and J16971.

Field duplicate samples provide a relative measure of the degree of local heterogeneity in the sampling medium, unlike laboratory duplicates that are used to evaluate precision in the analytical process. The field duplicates are evaluated by computing the RPD of the duplicate samples for each contaminant of concern. None of the RPDs calculated for field duplicates are above the acceptance criteria (30%). The data are useable for decision-making purposes.

A visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The data are useable for decision-making purposes.

SUMMARY

Limited, random, or sample matrix-specific influenced batch QC issues such as those discussed above are a potential for any analysis. The number and types seen in these data sets are within expectations for the matrix types and analyses performed. The DQA review of the 100-F-26:9 verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling.

The DQA review for 100-F-26:9 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. Detection limits, precision, accuracy, and sampling data group completeness were assessed to determine if any analytical results should be rejected as a result of QA and QC deficiencies. The analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in the ENRE project-specific database prior to being submitted for inclusion in the HEIS database. The verification sample analytical data are also summarized in Appendix B.

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