APPENDIX B

Data Validation Reports for Rounds 64 through 67

DATA VALIDATION REPORT

Lewis County Shop Groundwater Testing 2018 (Rounds 64-67) SDGs 18C0265, 18F0113, 18J0143, 18L0121

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1 Introduction

This report summarizes the findings of the United States Environmental Protection Agency (USEPA) Stage 2A data validation performed on analytical data for the groundwater samples collected from March through December in 2018 for Lewis County Shop sampling. This data quality review is divided into sections by sample delivery group (SDG). A complete list of samples and analyses for each SDG is provided in the Sample Index at the beginning of each section.

Samples were analyzed for select VOCs by Analytical Resources, Inc. (ARI). The analytical methods are summarized below:

Analysis	Method	Laboratory
VOC	SW 8260C	ARI

The validation followed the procedures documented in the analytical methods, and the *National Functional Guidelines for Organic Data Review* (USEPA, 2017), and *Contract Laboratory Program SOW* (USEPA, 2016).

Data assigned a J qualifier (estimated) may be used for site evaluation purposes but the reasons for qualification should be taken into account when interpreting sample concentrations. Data marked as rejected (R) should not be used under any circumstances. Values without qualification meet all data measurement quality objectives and are suitable for use.

Data qualifier definitions and a summary table of the qualified data are included in the Qualified Data Summary at the end of this report. Data qualifiers have been incorporated into the project chemistry database to reflect the validation in this report.

2 Data Validation Findings for SDG 18C0265

Groundwater samples in this SDG, and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review by analyte group (analysis).

Sample Index

				Analysis
Sample ID	Sample Date	Sample Type	Sample Matrix	VOCs
19K2-031518	3/15/2018	N	AQ	Х

2.1 VOCs (SW 8260C)

2.1.1 Sample Receipt, Preservation, and Holding Times

Cooler temperature upon sample was within acceptable range. Review of the receiving indicates that samples were received in good condition.

Samples were analyzed within the requisite holding time limit.

2.1.2 Method Blanks/Detection Levels

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

2.1.3 Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

All LCS and LCSD %R and relative percent difference (RPD) were within the laboratory specified control limits for requested analytes. No qualification or action was needed.

2.1.4 Surrogates

All surrogate %R values were within laboratory specified control limits. No qualification or action was needed.

2.1.5 Case Narrative/Laboratory Qualification

The laboratory noted in the case narrative that %D values for the continuing calibration standards were outside control parameters for some parts of this analysis. The lab qualified some of the LCS and LCSD results using lab flag "Q" to indicate this. None of the analytical sample results appear to have been impacted. No further action was needed.

2.1.6 Overall Assessment

Accuracy was acceptable based on the LCS/LCSD except as noted above, and precision was acceptable based on the LCS/LCSD RPD values. The data are of known quality and are acceptable for use as qualified.

2.2 Qualified Data Summary

No sample results were qualified as part of this validation report. This list does not include non-detected values simply qualified U.

3 Data Validation Findings for SDG 18F0113

Groundwater samples in this SDG, and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review by analyte group (analysis).

Sample Index

Analysis				
Sample ID	Sample Date	Sample Type	Sample Matrix	SW8260C
19K2-060818	6/8/2018	N	AQ	Х

3.1 VOCs (SW 8260C)

3.1.1 Sample Receipt, Preservation, and Holding Times

Cooler temperature upon sample was within acceptable range. Review of the receiving indicates that samples were received in good condition.

Samples were analyzed within the requisite holding time limit.

3.1.2 Method Blanks/Detection Levels

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

A trip blank was also analyzed as part of this dataset. No target analytes were detected at or above reporting levels in the trip blank. No action or qualification needed.

3.1.3 Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

All LCS and LCSD %R and RPD were within the laboratory specified control limits for requested analytes. No qualification or action was needed.

3.1.4 Surrogates

All surrogate %R values were within laboratory specified control limit. No qualification or action was needed.

3.1.5 Overall Assessment

Accuracy was acceptable based on the LCS/LCSD %R except as noted above, and precision was acceptable based on the LCS/LCSD RPD values. The data are of known quality and are acceptable for use as qualified.

3.2 Qualified Data Summary

No sample results were qualified as part of this validation report. This list does not include non-detected values simply qualified U.

4 Data Validation Findings for SDG 18J0143

Groundwater samples in this SDG, and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review by analyte group (analysis).

-			_	Analysis
Sample ID	Sample Date	Sample Type	Sample Matrix	SW8260C
19F3-100518	10/5/2018	N	WG	Х
19K2-100518	10/5/2018	N	WG	Х
19L4-100518	10/5/2018	N	WG	Х
MW-11-100518	10/5/2018	N	WG	Х
MW-13-100418	10/4/2018	N	WG	Х
MW-14-100418	10/4/2018	N	WG	Х
MW-18D-100418	10/4/2018	N	WG	Х
MW-19-4-100418	10/4/2018	N	WG	Х
MW-19-7-100418	10/4/2018	N	WG	Х
MW-1R-100418	10/4/2018	N	WG	Х
MW-20-5-100418	10/4/2018	N	WG	Х
MW-20-7-100418	10/4/2018	N	WG	Х
MW-21-3-100418	10/4/2018	N	WG	Х
MW-21-7-100418	10/4/2018	N	WG	Х
MW-22-100518	10/5/2018	FD	WG	Х
MW-23-100518	10/5/2018	FD	WG	Х
MW-3-100418	10/4/2018	N	WG	Х
MW-4-100418	10/4/2018	N	WG	Х
MW-8-100418	10/4/2018	N	WG	X
MW-9-100518	10/5/2018	N	WG	X
PT-6-3-100418	10/4/2018	N	WG	X
PT-6-7-100418	10/4/2018	N	WG	Х

Sample Index

4.1 VOCs (SW 8260C)

4.1.1 Sample Receipt, Preservation, and Holding Times

Cooler temperatures upon receipt were below the acceptable range of 2-6 degrees C. Review of the receiving indicates that samples were received in good condition and that the slightly low cooler temperature was not impactful to the analytical results. No action was needed.

Minor labeling errors caused the sample labels on the bottles to slightly mismatch those on the COC. The lab was able to correctly identify the bottles. The lab noted that one extra sample, 19F3-100518, was included in the cooler, but had been left off the original COC. The COC was updated. No further action was needed.

Small air bubbles were noted by lab to be present in all sample bottles. No discernable impact was expected or evidenced. No further action was needed.

Samples were analyzed within the requisite holding time limits.

4.1.2 Method Blanks/Detection Levels

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

A trip blank was also analyzed as part of this dataset. No target analytes were detected at or above reporting levels in the trip blank. No action or qualification needed.

4.1.3 Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

All LCS and LCSD %R and RPD were within the laboratory specified control limits for request analytes, except for the following:

 Hexachlorobutadiene – LCS & LCSD %R High. Associated results were Nondetected. No qualifiers applied.

4.1.4 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

A Matrix Spike/Matrix Spike Duplicate pair was generated by the lab using sample MW-4-100418 as a base. All MS and MSD %R and RPD were within the laboratory specified control limits for request analytes, except for the following:

• 2-Chloroethyl Vinyl Ether had %R values of zero. All results were non-detect. In accordance with National Functional Guidelines, the results have been qualified as Rejected (R).

4.1.5 Surrogates

All surrogate %R values were within laboratory specified control limits. No qualification or action was needed.

4.1.6 Case Narrative/Laboratory Qualification

The laboratory noted in the case narrative that the Initial Calibration Verification (ICV) had recovery issues for some analytes. Analytes for which the ICV recovery was high were all non-detect in the associated samples, and thus not qualified. The following analytes recovered low in the ICV, and associated sample results have been qualified as estimated (J/UJ):

- Acrolein
- Dibromochloromethane
- Bromoform
- 1,4-Dichloro-2-Butene
- 1,2-Dibromo-3-chloropropane

No further action needed.

4.1.7 Field Duplicates (FD)

Two field duplicate samples were collected and submitted blind to the laboratory.

MW-22-100518 is a duplicate of MW-9-100518.

MW-23-100518 is a duplicate of 19K2-100518.

All RPD were within specified control limits. No action or qualification was needed.

4.1.8 Overall Assessment

Accuracy was acceptable based on the LCS/LCSD and MS/MSD, except as noted above, and precision was acceptable based on the LCS/LCSD and MS/MSD RPD values, except as noted above. The data are of known quality and are acceptable for use as qualified, with the exception of any rejected values.

4.2 Qualified Data Summary

Listed below are the sample results qualified as part of this validation report. This list does not include non-detected values simply qualified U.

Sample	Analyte	Qual	Qualification Reason
19F3-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
19F3-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
19F3-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
19F3-100518	Bromoform	UJ	Lab reports ICV %R Low
19F3-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
19K2-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
19K2-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
19K2-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
19K2-100518	Bromoform	UJ	Lab reports ICV %R Low
19K2-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
19L4-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
19L4-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
19L4-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
19L4-100518	Bromoform	UJ	Lab reports ICV %R Low
19L4-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-11-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-11-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-11-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-11-100518	Bromoform	UJ	Lab reports ICV %R Low
MW-11-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-13-100418	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-13-100418	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low

Qualified Sample Results

Sample	Analyte	Qual	Qualification Reason
MW-13-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-13-100418	Bromoform	UJ	Lab reports ICV %R Low
MW-13-100418	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-14-100418	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-14-100418	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-14-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-14-100418	Bromoform	UJ	Lab reports ICV %R Low
MW-14-100418	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-18D-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-18D-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-19-4-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-19-4-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-19-7-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-19-7-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-1R-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-1R-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-20-5-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-20-5-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-20-7-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-20-7-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-21-3-100418	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-21-3-100418	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-21-3-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-21-3-100418	Bromoform	UJ	Lab reports ICV %R Low
MW-21-3-100418	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-21-7-100418	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-21-7-100418	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-21-7-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-21-7-100418	Bromoform	UJ	Lab reports ICV %R Low
MW-21-7-100418	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-22-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-22-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-22-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-22-100518	Bromoform	UJ	Lab reports ICV %R Low
MW-22-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-23-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-23-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-23-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-23-100518	Bromoform	UJ	Lab reports ICV %R Low
MW-23-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-3-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-3-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-4-100418	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-4-100418	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-4-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected

Sample	Analyte	Qual	Qualification Reason
MW-4-100418	Bromoform	UJ	Lab reports ICV %R Low
MW-4-100418	Dibromochloromethane	UJ	Lab reports ICV %R Low
MW-8-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-8-100418	Acrolein	UJ	Lab reports ICV %R Low
MW-9-100518	1,2-Dibromo-3-chloropropane	UJ	Lab reports ICV %R Low
MW-9-100518	1,4-Dichloro-2-Butene	UJ	Lab reports ICV %R Low
MW-9-100518	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
MW-9-100518	Bromoform	UJ	Lab reports ICV %R Low
MW-9-100518	Dibromochloromethane	UJ	Lab reports ICV %R Low
PT-6-3-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
PT-6-3-100418	Acrolein	UJ	Lab reports ICV %R Low
PT-6-7-100418	2-Chloroethyl Vinyl Ether	R	MS/MSD <10% recovery. Rejected
PT-6-7-100418	Acrolein	UJ	Lab reports ICV %R Low

5 Data Validation Findings for SDG 18L0121

The groundwater sample in this SDG, and the chemical analysis performed on it, are tabulated below. The sections below describe the results of the data quality review by analyte group (analysis).

Sample Index						
				Analysis		
Sample ID	Sample Date	Sample Type	Sample Matrix	SW8260C		
19K2-120718	12/7/2018	N	AQ	Х		

5.1 VOCs (SW 8260C)

5.1.1 Sample Receipt, Preservation, and Holding Times

Cooler temperature upon sample was within acceptable range. Review of the receiving indicates that samples were received in good condition.

Samples were analyzed within the requisite holding time limit.

5.1.2 Method Blanks/Detection Levels

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

A trip blank was also analyzed as part of this dataset. No target analytes were detected at or above reporting levels in the trip blank. No action or qualification needed.

5.1.3 Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

All LCS and LCSD %R and RPD were within the laboratory specified control limits for requested analytes. No qualification or action was needed.

5.1.4 Surrogates

All surrogate %R values were within laboratory specified control limit. No qualification or action was needed.

5.1.5 Case Narrative/Laboratory Qualification

The laboratory noted that a power outage occurred during the initial analysis. This did not impact the sample analysis at all but did cause the Trip Blank analysis to occur in a separate analytical run, with separate QC. This has been assessed to have no appreciable impact on the results.

The lab also noted that the Initial Calibration Verifications had recovery issues for some analytes. Analytes for which the ICV recovery was high were all non-detect in the associated samples, and thus not qualified. The following analytes recovered low in the ICV, and associated sample results have been qualified as estimated (UJ):

- 1,4-Dichloro-2-Butene
- 1,2-Dibromo-3-chloropropane

No further action needed.

5.1.6 Overall Assessment

Accuracy was acceptable based on the LCS/LCSD % and precision was acceptable based on the LCS/LCSD RPD values. The data are of known quality and are acceptable for use as qualified.

5.2 Qualified Data Summary

Listed below are the sample results qualified as part of this validation report. This list does not include non-detected values simply qualified U.

Sample	Analyte	Qual	Qualification Reason
19K2-120718	1,2-Dibromo-3-chloropropane	UJ	ICV %R Low
19K2-120718	1,4-Dichloro-2-Butene	UJ	ICV %R Low

6 Data Qualifier Definitions

Data Qualifier	Definition
J	The analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
U	The analyte was analyzed for but was considered not detected at the reporting limit or reported value.
UJ	The analyte was analyzed for, and the associated quantitation limit was an estimated value.

7 References

- U.S. Environmental Protection Agency (USEPA), 2017 National Functional Guidelines for Organic Methods Data Review, Office of Superfund Remediation and Technology Innovation (OSRTI), USEPA Publication No. 540-R-2017-002, January.
- U.S. Environmental Protection Agency (USEPA), Contract Laboratory Program (CLP) Statement of Work (SOW) for Organic Superfund Methods, Multi-Media, Multi-Concentration, SOM02.4, October 2016.