

Data Validation Reports



United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Diesel Range Organic and Metal Analysis

SDG # 2309-126

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51778R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-126 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

O-mails ID			Sample	Demont October	Ana	lysis
Sample ID		Matrix	Date	Parent Sample	DRO	Metals
SS-G-001-091323	09-126-01	Soil	09/13/2023			Х
SS-G-002-091323	09-126-02	Soil	09/13/2023			Х
SS-G-003-091323	09-126-03	Soil	09/13/2023			Х
SS-G-004-091323	09-126-04	Soil	09/13/2023			Х
SS-G-005-091323	09-126-05	Soil	09/13/2023			Х
SS-G-006-091323	09-126-06	Soil	09/13/2023			Х
EB-G-001-091323	09-126-07	Soil	09/13/2023			Х
EB-G-002-091323	09-126-08	Soil	09/13/2023			Х
SS-G-007-091323	09-126-09	Soil	09/13/2023			Х
SS-L-001-091323	09-126-10	Soil	09/13/2023		Х	Х
SS-L-002-091323	09-126-11	Soil	09/13/2023		Х	Х
SS-L-003-091323	09-126-12	Soil	09/13/2023		Х	Х
SS-L-004-091323	09-126-13	Soil	09/13/2023		Х	Х
SS-L-005-091323	09-126-14	Soil	09/13/2023		Х	Х
SS-L-006-091323	09-126-15	Soil	09/13/2023		Х	Х
SS-L-007-091323	09-126-16	Soil	09/13/2023		Х	Х
EB-L-001-091323	09-126-17	Soil	09/13/2023		Х	Х
EB-L-002-091323	09-126-18	Soil	09/13/2023		Х	Х

Note:

DRO Diesel Range Organic

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Itoms Reviewed	Rep	orted	Perfor Acce	mance ptable	Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		X	
3.	Master tracking list		Х		X	
4.	Methods of analysis		Х		X	
5.	Reporting limits		Х		X	
6.	Sample collection date		Х		X	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		X	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		Х	
12.	Data Package Completeness and Compliance		Х		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables

because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
NWTPH-Dx	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed on the sample SS-L-001-091323. The laboratory duplicate analysis exhibited RPD within the control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report but were within the acceptable recovery limits as indicated by the laboratory.

7. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

8. System Performance and Overall Assessment

The laboratory qualified a few Lube Oil Range Organics results with a "N1" qualifier to indicate Hydrocarbons in diesel range are impacting lube oil range results. The "N1" qualifier was removed and "J" qualifier added to indicate the result is estimated.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DIESEL RANGE ORGANICS ANALYSES

DIESEL RANGE ORGANICS ANALYSE:	Repo	orted	Perfor Acce	mance ptable	Not
NWTPH-Dx	No	Yes	No	Yes	Required
Gas Chromatography/Flame Ionization Detector (GC/FID))				
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		Х		Х	
Blanks			-		
A. Method blanks		X		Х	
B. Equipment/Field blanks	Х				Х
C. Rinse blanks	Х				Х
Surrogates Accuracy (%R)		Х		Х	
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD RPD	Х				Х
Laboratory Duplicate Sample RPD		Х		Х	
Field Duplicate Sample RPD	Х				Х
Dilution Factor	Х				Х

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed on sample EB-G-002-091323. The MS/MSD analysis exhibited recovery and RPD within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis performed on sample EB-G-002-091323. The laboratory duplicate analysis exhibited acceptable RPD.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

A field duplicate sample was not collected for the samples from this SDG.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METAL S. SW-846 6010D	Rep	orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spec	trometry (I	CP-AES)			
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		X		Х	
Blanks					
A. Method Blanks		X		Х	
B. Equipment/Field Blanks	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		X		Х	
Matrix Spike Duplicate (MSD) %R		X		Х	
MS/MSD Precision (RPD)		X		Х	
Laboratory Duplicate Sample (RPD)		X		Х	
Field Duplicate Sample (RPD)	Х				Х
ICP Serial Dilution %D	Х				Х
Reporting Limit Verification		X		Х	

Notes:%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M $\cdot \cdot$

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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1 55-6-001-091323	9/13/2	23 1240	5	1																	X			Ø
2 55-4-002-091323	1	1245	5	1										÷							X			,
3 55-6-003-091323		1250	S	1																	X			
4 55-6-004-091323		1300	S	1																	X	3		
5 55-6-005-091323		1305	5	1																	X			
6 55-6-006-091323		1310	5	1																	X			
7 EB-G-001-091323	(1320	S	1																	X			
8 EB-G-002-091323		1325	S	2																	X		X	1
9 55-6-007-091323	/	1315	S	1																	X			
10 55-2-001-091323	9/13/2	23 1600	S	1																	X	X		
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Lah ID Sample Identification	Date	Time	Matrix	Number 0	IMTPH-F	WTPH-G	MTPH-0	NWTPH-C	/olatiles 8	lalogenat	EDB EPA	Semivolat with low-l	PAHs 8270	PCBs 808	Organoch	Organoph	Chlorinate	otal RCR	otal MTC	CLP Met	HEM (oil a	otal	KO H		6 Moisture
11 55-L-DOZ-091323	9/13/23	1605	5	1		2	2	2	_			0,2				0	0				-	X	X		X
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15 55-2-006-091323		1625	S	1																		Х	X		
16 55-2-007-091323		1630	5	1																		Х	X		
17 EB-L-001-091323	\sum	1635	5	۱																		Х	X		
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TOTAL LEAD EPA 6010D

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-G-001-091323					
Laboratory ID:	09-126-01					
Lead	74	5.3	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-G-002-091323					
Laboratory ID:	09-126-02					
Laboratory ID.	96	55		0_1/_23	0.15.23	
Leau	50	5.5	EFA 0010D	9-14-23	9-13-23	
Client ID:	SS-G-003-091323					
Laboratory ID:	09-126-03					
Lead	130	5.3	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-G-004-091323					
Laboratory ID.	09-126-04					
Lead	140	5.3	EPA 6010D	9-14-23	9-15-23	
		0.0			0.020	
Client ID:	SS-G-005-091323					
Laboratory ID:	09-126-05					
Lead	150	5.3	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-G-006-091323					
Laboratory ID:	09-126-06					
Lead	33	5.2	EPA 6010D	9-14-23	9-15-23	
Client ID:	ER C 001 001223					
Laboratory ID:	00 126 07					
Laboratory ID.	09-120-07 52	5.0		0 14 22	0 15 22	
Leau	JZ	0.2	EPA 0010D	9-14-23	9-15-25	
Client ID:	EB-G-002-091323					
Laboratory ID:	09-126-08					
Lead	90	5.2	EPA 6010D	9-14-23	9-15-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

TOTAL LEAD EPA 6010D

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-G-007-091323					
Laboratory ID:	09-126-09					
Lead	110	5.3	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS 1 004 004202					
	00 106 10					
	09-120-10	E 0		0 14 00	0 15 02	
Lead	94	5.3	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-L-002-091323					
Laboratory ID:	09-126-11					
Lead	ND	5.3	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS 1 002 004222					
	55-L-003-091323					
Laboratory ID:	09-126-12			0.44.00	0.45.00	
Lead	(.5	5.5	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-L-004-091323					
Laboratory ID:	09-126-13					
Lead	59	5.7	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-L-005-091323					
Laboratory ID:	09-126-14					
Lead	68	5.6	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-L-006-091323					
Laboratory ID:	09-126-15					
Lead	150	5.7	EPA 6010D	9-14-23	9-15-23	
Client ID:	SS-L-007-091323					
Laboratory ID:	09-126-16					
Lead	34	5.4	EPA 6010D	9-14-23	9-15-23	



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TOTAL LEAD EPA 6010D

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-L-001-091323					
Laboratory ID:	09-126-17					
Lead	13	5.3	EPA 6010D	9-14-23	9-15-23	

Client ID:	EB-L-002-091323				
Laboratory ID:	09-126-18				
Lead	52	5.7	EPA 6010D	9-14-23	9-15-23



DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-L-001-091323					
Laboratory ID:	09-126-10					
Diesel Range Organics	ND	27	NWTPH-Dx	9-14-23	9-15-23	
Lube Oil Range Organics	57	53	NWTPH-Dx	9-14-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	86	50-150				
Client ID:	SS-L-002-091323					
Laboratory ID:	09-126-11					
Diesel Range Organics	45	26	NWTPH-Dx	9-14-23	9-15-23	
Lube Oil Range Organics	220	53	NWTPH-Dx	9-14-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	82	50-150				
	001 000 004000					
	55-L-003-091323					
	09-126-12			0.44.00	0.45.00	
Diesel Range Organics	45	28		9-14-23	9-15-23	
Lube Oil Range Organics	ZUU Dereent Decevery	00 Control Limito	NVV IPH-DX	9-14-23	9-15-23	
Surrogale.		CONTO LINIS				
0-reiphenyi	00	50-750				
Client ID:	SS-L-004-091323					
Laboratory ID:	09-126-13					
Diesel Range Organics	1100	28	NWTPH-Dx	9-14-23	9-15-23	
Lube Oil Range Organics	760	57	NWTPH-Dx	9-14-23	9-15-23	N J
Surrogate:	Percent Recoverv	Control Limits				1
o-Terphenyl	77	50-150				
Client ID:	SS-L-005-091323					
Laboratory ID:	09-126-14					
Diesel Range Organics	1300	28	NWTPH-Dx	9-14-23	9-15-23	Υ.
Lube Oil Range Organics	710	57	NWTPH-Dx	9-14-23	9-15-23	<u> </u>
Surrogate:	Percent Recovery	Control Limits				N N
o-Terphenyl	85	50-150				
	SS 1 006 004222					
Laboratory ID:	00 106 15					
Diagol Dange Organise	09-120-13	20		0 14 00	0 16 00	
	04 260	29 57		9-14-23	9-10-20 0 15 00	
	ZOU Dereent Deservers	J/ Control Limita		9-14-23	9-10-20	
Surroyale.	nercent Recovery	50 150				
о-тегриену	91	50-150				



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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

0 0 0 1 7				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-L-007-091323					
Laboratory ID:	09-126-16					
Diesel Range Organics	ND	27	NWTPH-Dx	9-14-23	9-15-23	
Lube Oil Range Organics	68	54	NWTPH-Dx	9-14-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	81	50-150				
Client ID:	EB-L-001-091323					
Laboratory ID:	09-126-17					
Diesel Range Organics	ND	27	NWTPH-Dx	9-14-23	9-15-23	
Lube Oil Range Organics	61	53	NWTPH-Dx	9-14-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	77	50-150				
Client ID:	EB-L-002-091323					
Laboratory ID:	09-126-18					
Diesel Range Organics	83	28	NWTPH-Dx	9-14-23	9-15-23	
Lube Oil Range Organics	90	57	NWTPH-Dx	9-14-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	78	50-150				



% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
SS-G-001-091323	09-126-01	5	9-14-23
SS-G-002-091323	09-126-02	8	9-14-23
SS-G-003-091323	09-126-03	6	9-14-23
SS-G-004-091323	09-126-04	5	9-14-23
SS-G-005-091323	09-126-05	6	9-14-23
SS-G-006-091323	09-126-06	5	9-14-23
EB-G-001-091323	09-126-07	4	9-14-23
EB-G-002-091323	09-126-08	4	9-14-23
SS-G-007-091323	09-126-09	5	9-14-23
SS-L-001-091323	09-126-10	6	9-14-23
SS-L-002-091323	09-126-11	5	9-14-23
SS-L-003-091323	09-126-12	10	9-14-23
SS-L-004-091323	09-126-13	12	9-14-23
SS-L-005-091323	09-126-14	11	9-14-23
SS-L-006-091323	09-126-15	12	9-14-23
SS-L-007-091323	09-126-16	8	9-14-23
EB-L-001-091323	09-126-17	6	9-14-23
EB-L-002-091323	09-126-18	12	9-14-23



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United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Diesel Range Organic, Polychlorinated Biphenyls (PCBs) and Metal Analysis

SDG # 2309-141

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51779R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-141 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Comple ID	Lab ID	Metrix	Sample	Derent Comple		Analysi	s
Sample ID		Matrix	Date	Parent Sample	РСВ	DRO	Metals
SS-0-001-091423	09-141-01	Soil	09/14/2023				Х
SS-0-002-091423	09-141-02	Soil	09/14/2023				Х
SS-0-003-091423	09-141-03	Soil	09/14/2023				Х
SS-0-004-091423	09-141-04	Soil	09/14/2023				Х
SS-0-005-091423	09-141-05	Soil	09/14/2023				Х
SS-0-006-091423	09-141-06	Soil	09/14/2023				Х
EB-0-001-091423	09-141-07	Soil	09/14/2023				Х
SS-J-001-091423	09-141-08	Soil	09/14/2023		Х	Х	Х
SS-J-002-091423	09-141-09	Soil	09/14/2023		Х	Х	Х
SS-J-003-091423	09-141-10	Soil	09/14/2023		Х	Х	Х
SS-J-004-091423	09-141-11	Soil	09/14/2023		Х	Х	Х
SS-J-005-091423	09-141-12	Soil	09/14/2023		Х	Х	Х
EB-J-001-091423	09-141-13	Soil	09/14/2023		Х	Х	Х
EB-J-002-091423	09-141-14	Soil	09/14/2023		Х	Х	Х
EB-J-003-091423	09-141-15	Soil	09/14/2023		Х	Х	Х
Dup-006-091423	09-141-16	Soil	09/14/2023	SS-J-004-091423	Х	Х	Х

Notes:

PCB Polychlorinated Biphenyls

DRO Diesel Range Organic

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed		Reported		Performance Acceptable		Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		Х		Х	
12.	Data Package Completeness and Compliance		Х		х	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8082A, and NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Soil	1 year from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis performed on sample Dup-006-091423. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-J-004-091423 / Dup-006-091423	Aroclor 1260	0.40	0.46	14.6%
Note:		·	· · · · · · · · · · · · · · · · · · ·	

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

The PCBs sample results were not qualified with the "P" qualifier by the laboratory therefore the dual column RPD results were assumed to be within the control limits.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

Pesticides: SW-846 8082A		Reported		nance table	Not	
		Yes	No	Yes	Required	
Gas Chromatography/Electron Capture Detector (GC/	ECD)					
Tier II Validation						
Holding times		Х		Х		
Reporting limits (units)		Х		Х		
Blanks						
A. Method blanks		X		Х		
B. Equipment blanks	Х				Х	
C. Rinse blank	Х				Х	
Laboratory Control Sample (LCS) %R	Х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD Precision (RPD)	Х				Х	
Matrix Spike (MS) %R		Х		Х		
Matrix Spike Duplicate (MSD) %R		х		Х		
MS/MSD RPD		Х		Х		
Field Duplicate Sample RPD		Х		Х		
Surrogate Spike Recoveries		Х		Х		
Column %D \leq 40% (If dual column is performed for reporting - not confirmation)	х				Х	
Dilution Factor	Х				Х	
Moisture Content		Х		Х		

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
NWTPH-Dx	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed on the sample SS-J-001-091423. The laboratory duplicate analysis exhibited RPD within the control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

7. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Sample ID/Duplicate ID Analyte		Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-J-004-091423 /	Diesel Range Organics	180	170	5.7%
Dup-006-091423	Lube Oil Range Organics	78	61	AC

Results for duplicate samples are summarized in the following table.

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DIESEL RANGE ORGANICS ANALYSES

DIESEL RANGE ORGANICS ANALYSE: NWTPH-Dx		Reported		rmance ptable	Not	
		Yes	No	Yes	Required	
Gas Chromatography/Flame Ionization Detector (GC/FID)						
Tier II Validation						
Holding Times		X		Х		
Reporting limits (units)		Х		Х		
Blanks			-			
A. Method blanks		Х		Х		
B. Equipment/Field blanks	Х				Х	
C. Rinse blanks	Х				Х	
Surrogates Accuracy (%R)		Х		Х		
Matrix Spike (MS) %R	Х				Х	
Matrix Spike Duplicate (MSD) %R	Х				Х	
MS/MSD Precision (RPD)	Х				Х	
Laboratory Control Sample (LCS) %R	Х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD RPD	Х				Х	
Laboratory Duplicate Sample RPD		Х		Х		
Field Duplicate Sample RPD	Х				Х	
Dilution Factor	Х				Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

A MS/MSD analysis was not performed on samples from this SDG.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was not performed on samples from this SDG.
4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCSresults were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-J-004-091423 / Dup-006-091423	Lead	34	29	15.9%

Note:

AC Acceptable

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D		orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spect	rometry (I	CP-AES)			
Tier II Validation					
Holding Times		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method Blanks		Х		Х	
B. Equipment/Field Blanks	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Duplicate Sample (RPD)	Х				Х
Field Duplicate Sample (RPD)		Х		Х	
ICP Serial Dilution %D	Х				Х
Reporting Limit Verification		X		Х	

Notes:%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M $\cdot \cdot$

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



OnSite	Chain of Custody								Page of2														
Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052		Turnaround Request (in working days)					- 1	4.	1						1								
Phone: (425) 883-3881 • www.onsite-env.com Company: Project Number:	Sa	(Check One) ame Day	Rush 1 Day											WIS/0						(010)		Xd-H	
30092974.00003	2	Days	3 Days			3260								001 es 827(8151					9		E V	
USCG BUFFOWS Island	St	tandard (7 Days)		SI		10 8		2	8260	rs Only	M	level)		esticide	picides				1664	163		NN NN	
Project Mañager: Paul McCullough Sampled by:	$\left \Box \right $	(other)		of Containe	quD	3x/BTEX (80	ax Dx (SG Clea		sz60 ted Volatiles	8011 (Wate	iles 8270/SI level PAHs)	0/SIM (low-		Ionne Pesu	ed Acid Herl	A Metals	A Metals	als	and grease)	Metal	-	ha of	Ø
I NOMOS IVONNINI	Date	Time		mber	TPH-+	ЛРН-О	ЛРН-С		atiles a ogenal	B EPA	mivolat th low-	-1s 827	808 SH	janoch janoph	lorinate	al RCR	al MTC	LP Met	M (oil a	121	.85	102	Aoistur
Lab ID Sample Identification	Sample	ed Sampled	Matrix	Nu	MN	Ň	NN NN		Hal Vol	ā	Ser (wit	PA	2 d		- F	Tota	Tota	10	Ξ	P	2	6	N %
1 55-0-001-041423	914	23 1005	5	1																X			
2 55-0-002-091423	1	1010	\$	1																X			
3 55-0-003-091423		1015	S	1																X			
4 55-0-004-091423		1020	S	1																X			
5 55-0-005-091423		1025	5	1																X			
6 55-0-006-091423		1030	S	1																X			
7 EB-0-001-091423	1	1035	S	1																X			
8 55-5-001-091423		1515	5	1																X	X	×	
9 55-J-002-091423		1520	5	1													+			X	X	X	
10 55-J-003-091423	9/14	231525	S	1									\uparrow	\uparrow						X	X	X	
Signature	1.0.00	Company		<u> </u>		Date			Time		Cor	nment	s/Spe	cial In	structi	ons		1		đ		/~	
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OnSite Environmental Inc.		Chain of Custody										Pa	age	2	_ of _	У	2							
Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052	Т	urnaround Red (in working da	quest ays)		L	abo	rat	ory	Nun	ıbe	r:	09) -	14	11									
Company: Arc2AIS Project Number: 30092.874,00003	_	(Check One me Day Davs	1 Day			90[])-	4							1	8270/SIM	151				1.1.1	1 (6010)	VV- non		
Project Name: USCG BUFFOWS Island	- Sta	andard (7 Days)		5		21 82		([] dn-	USCR	Onlivi		evel)		ides 808	sticides	icides 8				664	ES	AIM		
Project Manager: P2v1 McCullovgh Sampled by: Thomas Nanking		(other)		r of Container	1-HCID	H-Gx/BTEX (802	l-Gx	I-Dx (SG Clean	s 8260	DA R011 AMatere	A 6011 (waters latiles 8270/SIN	w-level PAHs) 270/SIM (low-le	082	chlorine Pestici	phosphorus Pe	ated Acid Herbi	CRA Metals	TCA Metals	<i>l</i> letals	il and grease) 1	i Metal	5 100 20	12 21.1	ture
Lab ID Sample Identification	Date Sample	Time d Sampled	Matrix	Numbe	NWTPH	NWTPH	NWTPF	NWTPF	Volatile		Semivo	(with lo PAHs 8	PCBs 8	Organo	Organo	Chlorin	Total R	Total M	TCLP N	HEM (o	10	590		% Mois
11 55-J-004-091423	914)	1530	5	1																ľ	X	X	X	
12 55-J-005-091423	5	1535	S	1																	X	X	X	\square
13 EB-J-001-091423		1540	S	1																	X	X	X	
14 EB-J-002-091423		1545	S	1											8						X	X)	<	
15 EBJ-003-091423		1550	S	}																	X	X :	X	
16 Dup-006-091423	9/14/2	3 -	S	1																	X	XZ	κ	
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Reviewed/Date		Reviewed/D	Date								C	hrom	atogra	ims w	rith fin	nal re	port [Ele	ectroni	c Data	a Deliv	erable:	(EDDs	X

TOTAL LEAD EPA 6010D

Units: ma/Ka (ppm)						
				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-0-001-091423			-		
Laboratory ID:	09-141-01					
Lead	190	5.7	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-0-002-091423					
Laboratory ID.	09-141-02					
Lead	23	5.4	EPA 6010D	9-18-23	9-18-23	
	-					
Client ID:	SS-0-003-091423					
Laboratory ID:	09-141-03					
Lead	130	5.3	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-0-004-091423					
Laboratory ID:	09-141-04					
Lead	110	5.3	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-0-005-091423					
Laboratory ID:	09-141-05					
Lead	30	5.7	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-0-006-091423					
Laboratory ID:	09-141-06					
Lead	94	5.4	EPA 6010D	9-18-23	9-18-23	
Client ID:	EB-0-001-091423					
Laboratory ID:	09-141-07					
Lead	31	5.5	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-J-001-091423					
Laboratory ID:	09-141-08					
Lead	19	5.3	EPA 6010D	9-18-23	9-18-23	

Soil Matrix:

A

OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

TOTAL LEAD EPA 6010D

Matrix: Soil						
Units: mg/Kg (ppm)						
				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-J-002-091423					
Laboratory ID:	09-141-09					
Lead	9.4	5.3	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-J-003-091423					
Laboratory ID [.]	09-141-10					
Lead	5.6	5.3	EPA 6010D	9-18-23	9-18-23	
	SS 1 004 004 422					
	55-J-004-091423					
	09-141-11	5.0		0.40.00	0.40.00	
Lead	34	5.2	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-J-005-091423					
Laboratory ID:	09-141-12					
Lead	44	5.4	EPA 6010D	9-18-23	9-18-23	
Client ID:	EB- 1-001-091423					
	00-1/1-13					
	7.8	5.4		0_18_23	0_18_23	
Leau	1.0		EFA 0010D	9-10-23	9-10-23	
Client ID:	EB-J-002-091423					
Laboratory ID:	09-141-14					
Lead	ND	5.2	EPA 6010D	9-18-23	9-18-23	
Client ID:	EB-J-003-091423					
Laboratory ID:	09-141-15					
Lead	9.4	5.3	EPA 6010D	9-18-23	9-18-23	
Client ID:	Dup-006-091423					
Laboratory ID:	09-141-16					
Lead	29	5.3	EPA 6010D	9-18-23	9-18-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

Matrix: Soil Units: mg/Kg (ppm)

0 0 0 1 7				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-J-001-091423					
Laboratory ID:	09-141-08					
Aroclor 1016	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1260	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	75	50-127				
Client ID:	SS-J-002-091423					
Laboratory ID:	09-141-09					
Aroclor 1016	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1260	0.96	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	71	50-127				
Client ID:	SS 1 002 001422					
	00 1/1 10					
Aroclar 1016	09-141-10 ND	0.053		0 15 23	0 16 23	
Aroclor 1221		0.053		9-15-23	9-10-23	
Aroclor 1221		0.053		9-15-23	9-10-23	
Aroclor 1242		0.053		9-15-23	9-16-23	
Aroclor 1242		0.053		9-15-23	9-16-23	
Aroclor 1254		0.053		9-15-23	9-16-23	
Aroclor 1260	0 062	0.053		9-15-23 9-15-23	9-16-23	
Aroclor 1262	0.002 ND	0.053		9-15-25 9-15-23	9-16-23	
Aroclor 1268		0.053		9-15-23 9-15-23	9-16-23	
Surrogate:	Percent Recovery	Control Limits		0-10 - 20	3-10-23	
DCR	72	50_107				
	73	50-121				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

6

Matrix: Soil Units: mg/Kg (ppm)

0 0 (11)				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-J-004-091423					
Laboratory ID:	09-141-11					
Aroclor 1016	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1221	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1232	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1242	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1248	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1254	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1260	0.40	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1262	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Aroclor 1268	ND	0.052	EPA 8082A	9-15-23	9-16-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	71	50-127				
Client ID:	SS-1-005-091423					
Laboratory ID:	09-141-12					
Aroclor 1016	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1221	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1232	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1242	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1248	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1254	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1260	0.29	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1262	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Aroclor 1268	ND	0.054	EPA 8082A	9-15-23	9-16-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	68	50-127				
Client ID:	FB-1-001-091423					
Laboratory ID.	09-141-13					
Aroclor 1016	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1221	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1232	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1242	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1248	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1254	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1260	1.7	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1262	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Aroclor 1268	ND	0.11	EPA 8082A	9-15-23	9-16-23	
Surrogate:	Percent Recoverv	Control Limits				
DCB	66	50-127				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

7

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-J-002-091423					
Laboratory ID:	09-141-14					
Aroclor 1016	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1221	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1232	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1242	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1248	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1254	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1260	8.3	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1262	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Aroclor 1268	ND	0.52	EPA 8082A	9-15-23	9-18-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	70	50-127				
Client ID:	EB-J-003-091423					
Laboratory ID:	09-141-15					
Aroclor 1016	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1260	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-15-23	9-16-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	74	50-127				
Client ID:	Dup-006-091423					
Laboratory ID:	09-141-16					
Aroclor 1016	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1260	0.46	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-18-23	9-18-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	74	50-127				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

8

DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-J-001-091423					
Laboratory ID:	09-141-08					
Diesel Range Organics	ND	27	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	140	53	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	68	50-150				
Client ID:	SS-J-002-091423					
Laboratory ID:	09-141-09					
Diesel Range Organics	33	26	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	ND	53	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	68	50-150				
	00 1 000 004 000					
	55-J-003-091423					
	09-141-10	07		0.45.00	0.45.00	
Diesel Range Organics	290	27	NWTPH-DX	9-15-23	9-15-23	
Lube Oil Range Organics	200		NW IPH-DX	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
0-Terphenyi	02	50-150				
Client ID:	SS-J-004-091423					
Laboratory ID:	09-141-11					
Diesel Range Organics	180	26	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	78	52	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits		0 10 20	0.010	
o-Terphenvl	68	50-150				
, ,						
Client ID:	SS-J-005-091423					
Laboratory ID:	09-141-12					
Diesel Range Organics	130	27	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	58	54	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	69	50-150				
Client ID:						
	EB-J-001-091423					
	09-141-13	07		0.45.00	0.45.00	
Diesei Range Organics	91	21		9-15-23	9-15-23	
		54	INVV I PH-DX	9-15-23	9-15-23	
Surrogate:	rercent Recovery	Control Limits				
o-rerprienyi	/δ	50-150				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

0 0 0 1 7				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-J-002-091423					
Laboratory ID:	09-141-14					
Diesel Range Organics	ND	26	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	ND	52	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	70	50-150				
Client ID:	EB-J-003-091423					
Laboratory ID:	09-141-15					
Diesel Range Organics	97	27	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	60	53	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	75	50-150				
Client ID:	Dup-006-091423					
Laboratory ID:	09-141-16					
Diesel Range Organics	170	26	NWTPH-Dx	9-15-23	9-15-23	
Lube Oil Range Organics	61	53	NWTPH-Dx	9-15-23	9-15-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	76	50-150				



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% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
SS-0-001-091423	09-141-01	13	9-15-23
SS-0-002-091423	09-141-02	7	9-15-23
SS-0-003-091423	09-141-03	6	9-15-23
SS-0-004-091423	09-141-04	7	9-15-23
SS-0-005-091423	09-141-05	12	9-15-23
SS-0-006-091423	09-141-06	7	9-15-23
EB-0-001-091423	09-141-07	9	9-15-23
SS-J-001-091423	09-141-08	6	9-15-23
SS-J-002-091423	09-141-09	5	9-15-23
SS-J-003-091423	09-141-10	6	9-15-23
SS-J-004-091423	09-141-11	4	9-15-23
SS-J-005-091423	09-141-12	7	9-15-23
EB-J-001-091423	09-141-13	7	9-15-23
EB-J-002-091423	09-141-14	4	9-15-23
EB-J-003-091423	09-141-15	6	9-15-23
Dup-006-091423	09-141-16	5	9-15-23



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881



United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Diesel Range Organic, Polychlorinated Biphenyls (PCBs) and Metal Analysis

SDG # 2309-144

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51780R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-141 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Motrix	Sample	Perent Sample	Analysis						
Sample ID		Marix	Date	Parent Sample	РСВ	DRO	Metals				
RS-003-091123	09-144-01	Water	09/11/2023		Х	Х	х				
RS-004-091323	09-144-02	Water	09/13/2023				х				
RS-005-091423	09-144-03	Water	09/14/2023		Х	Х	X				

Notes:

PCB Polychlorinated Biphenyls

DRO Diesel Organic Range

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Itoms Poviourod	Rep	orted	Perfor Acce	rmance ptable	Not
		No	Yes	No	Yes	Required
1. Sample	e receipt condition		Х		Х	
2. Reque	sted analyses and sample results		Х		Х	
3. Master	tracking list		Х		Х	
4. Method	ds of analysis		Х		X	
5. Report	ing limits		Х		Х	
6. Sample	e collection date		Х		X	
7. Labora	tory sample received date		Х		X	
8. Sample	e preservation verification (as applicable)		Х		x	
9. Sample	e preparation/extraction/analysis dates		Х		X	
10. Fully ex	xecuted Chain-of-Custody (COC) form		X		Х	
11. Narrati probler	ve summary of Quality Assurance (QA) or sample ns provided		х		х	
12. Data P	ackage Completeness and Compliance		Х		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8082A, and NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Soil	1 year from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries

within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analysis exhibiting recovery and RPD within the control limit.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

Pesticides: SW-846 8082A		orted	Perfor Accep	mance otable	Not
resticities. SW-040 0002A	No	Yes	No	Yes	Required
Gas Chromatography/Electron Capture Detector (GC/	ECD)				
Tier II Validation					
Holding times		Х		X	
Reporting limits (units)		Х		X	
Blanks					
A. Method blanks		Х		X	
B. Equipment blanks	Х				Х
C. Rinse blank		Х		X	
Laboratory Control Sample (LCS) %R		Х		X	
Laboratory Control Sample Duplicate (LCSD) %R		Х		X	
LCS/LCSD Precision (RPD)		Х		X	
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD RPD	Х				Х
Field Duplicate Sample RPD	Х				Х
Surrogate Spike Recoveries		Х		Х	
Column %D \leq 40% (If dual column is performed for reporting - not confirmation)	x				X
Dilution Factor	Х				Х
Moisture Content		Х		Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
NWTPH-Dx	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed on the sample RS-003-091123. The laboratory duplicate analysis exhibited RPD within the control limits.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DIESEL RANGE ORGANICS ANALYSES

DIESEL RANGE ORGANICS ANALYSE:		orted	Perfor Acce	rmance ptable	Not
NWTPH-Dx	No	Yes	No	Yes	Required
Gas Chromatography/Flame Ionization Detector (GC/FID)	_			
Tier II Validation					
Holding Times		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method blanks		X		Х	
B. Equipment/Field blanks	Х				Х
C. Rinse blanks		Х		Х	
Surrogates Accuracy (%R)		Х		Х	
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD RPD	Х				Х
Laboratory Duplicate Sample RPD		X		Х	
Field Duplicate Sample RPD	Х				Х
Dilution Factor	Х				Х

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed for lead on sample RS-003-091123. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis performed for lead on sample RS-003-091123. The laboratory duplicate analysis exhibited RPD within the control limits.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

A field duplicate sample was not collected within this SDG.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: EPA 200.8		orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Mass Spectrometry (ICP	-MS)				
Tier II Validation					
Holding Times		Х		Х	
Reporting limits (units)		X		Х	
Blanks					
A. Method Blanks		X		Х	
B. Equipment/Field Blanks	Х				Х
C. Rinse Blank		Х		Х	
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		Х		Х	
Matrix Spike Duplicate (MSD) %R		Х		Х	
MS/MSD Precision (RPD)		Х		Х	
Laboratory Duplicate Sample (RPD)		Х		Х	
Field Duplicate Sample (RPD)	Х				Х
ICP Serial Dilution %D					Х
Reporting Limit Verification		X		Х	

Notes:%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M $\cdot \cdot$

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



OnSite Environmental Inc.		Cha	ain o)f (Cu	IS	0	dy											P	age	4	_ of	4			
14648 NE 95th Street • Redmond, WA 98052 Phone: (425) 883-3884 • New cosite-any com		(in working day	/s)			abo	rat	ory	Nur	nbe	er:	0	9	- 1	4	4										
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Lab ID Sample Identification	Date Sample	Time d Sampled	Matrix	Numbe	NWTPI	NWTP	NWTPI	NWTPI	Volatile	Haloge	EDB EI	Semivo (with Io	PAHs 8	PCBs {	Organo	Organo	Chlorin	Total R	Total N	TCLP N	HEM (c	[ota	R	DRO		
1 RS-003-091123	9/11/2	73 1440	W	5																		X	X	X		
2 25-004-091323	9113	23 2030	W	1																		X				
3 RS-005-091423	9142	32020	W	5																		X	X	X		
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Received Country Service		11.020	112			11.	-1.		00	UL																
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Reviewed/Date		Reviewed/Da	te						J			Chro	omato	ogran	ns wi	ith fin	al rep	port [_ Ele	ectron	ic Dat	ta Deli	verabi	les (E[Ds)	

TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-003-091123					
Laboratory ID:	09-144-01					
Lead	ND	1.1	EPA 200.8	9-15-23	9-15-23	
Client ID:	RS-004-091323					
Laboratory ID:	09-144-02					
Lead	ND	1.1	EPA 200.8	9-15-23	9-15-23	
Client ID:	RS-005-091423					
Laboratory ID:	09-144-03					
Lead	ND	1.1	EPA 200.8	9-15-23	9-15-23	



Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-003-091123					
Laboratory ID:	09-144-01					
Aroclor 1016	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1221	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1232	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1242	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1248	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1254	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1260	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1262	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1268	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	86	55-138				
Client ID:	RS-005-091423					
Laboratory ID:	09-144-03					
Aroclor 1016	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1221	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1232	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1242	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1248	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1254	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1260	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1262	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Aroclor 1268	ND	0.050	EPA 8082A	9-16-23	9-17-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	94	55-138				

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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Water Units: mg/L (ppm)

Analyte	Result	POI	Method	Date Prepared	Date Analyzed	Flags
Client ID:	RS-003-091123	F Q(L	Method	Flepaleu	Analyzeu	Tiags
Laboratory ID:	09-144-01					
Diesel Range Organics	ND	0.21	NWTPH-Dx	9-16-23	9-18-23	
Lube Oil Range Organics	ND	0.21	NWTPH-Dx	9-16-23	9-18-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	94	50-150				
Client ID:	RS-005-091423					
Laboratory ID:	09-144-03					
Diesel Range Organics	ND	0.20	NWTPH-Dx	9-16-23	9-18-23	
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	9-16-23	9-18-23	

		÷.=÷
Surrogate:	Percent Recovery	Control Limits
o-Terphenyl	87	50-150



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United States Coast Guard

DATA REVIEW

Burrows Island Light Station

Skagit County, Washington

Metal Analysis

SDG # 2309-168

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51781R Review Level: Tier II Project: 30092874.00004
SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-168 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Motrix	Sample	Parant Sampla	Analysis
Sample ID			Date	Farent Sample	Metals
SS-H-001-091823	09-168-01	Soil	09/18/2023		Х
SS-H-002-091823	09-168-02	Soil	09/18/2023		Х
SS-H-003-091823	09-168-03	Soil	09/18/2023		Х
SS-H-004-091823	09-168-04	Soil	09/18/2023		Х
SS-H-005-091823	09-168-05	Soil	09/18/2023		Х
SS-H-006-091823	09-168-06	Soil	09/18/2023		х
SS-H-007-091823	09-168-07	Soil	09/18/2023		Х
SS-H-008-091823	09-168-08	Soil	09/18/2023		Х
SS-H-009-091823	09-168-09	Soil	09/18/2023		Х
SS-H-010-091823	09-168-10	Soil	09/18/2023		Х
SS-H-011-091823	09-168-11	Soil	09/18/2023		Х
SS-H-012-091823	09-168-12	Soil	09/18/2023		Х
SS-H-013-091823	09-168-13	Soil	09/18/2023		Х
EB-H-001-091823	09-168-14	Soil	09/18/2023		Х
EB-H-002-091823	09-168-15	Soil	09/18/2023		Х
EB-H-003-091823	09-168-16	Soil	09/18/2023		Х
EB-H-004-091823	09-168-17	Soil	09/18/2023		Х
EB-H-005-091823	09-168-18	Soil	09/18/2023		Х
EB-H-006-091823	09-168-19	Soil	09/18/2023		Х
EB-H-007-091823	09-168-20	Soil	09/18/2023		Х
EB-H-009-091823	09-168-21	Soil	09/18/2023		Х
EB-H-010-091823	09-168-22	Soil	09/18/2023		Х
DUP-009-091823	09-168-24	Soil	09/18/2023	EB-H-001-091823	Х
DUP-010-091823	09-168-25	Soil	09/18/2023	EB-H-010-091823	Х
RS-008-091823	09-168-26	Water	09/18/2023		Х
DUP-011-091823	09-168-27	Soil	09/18/2023	SS-H-001-091823	Х
EB-H-008-091823	09-168-28	Soil	09/18/2023		Х

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Itoms Poviowod	Rep	orted	Perfor Acce	mance ptable	Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		X		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		х	
12.	Data Package Completeness and Compliance		Х		х	

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analyte were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed for lead on samples SS-H-001-091823, SS-H-010-091823 and EB-H-001-091823. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed for lead on samples SS-H-001-091823, SS-H-010-091823 and EB-H-001-091823. The laboratory duplicate analysis exhibited RPDs within the control limits with the exception noted below.

Sample ID	Analytes	Laboratory RPD
SS-H-001-091823	Lead	31%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to the all-sample results associated with this SDG.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and laboratory sample	Soil 20%	Non-detect	UJ
concentration >5 times detection limit	501 20 %	Detect	J
Parent sample and/or laboratory	Water one times RL or	Non-detect	UJ
RL and difference between samples >RL	Soil two times RL	Detect	J

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
EB-H-001-091823/ DUP-009-091823	Lead	22	16	AC
EB-H-010-091823 / DUP-010-091823	Lead	120	120	0.0%
SS-H-001-091823 / DUP-011-091823	Lead	21	19	AC

Results for duplicate samples are summarized in the following table.

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METAL S: SW-846 6010D and EPA 200.8	Rep	orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spect Inductively Coupled Plasma - Mass Spectrometry (ICF	rometry (IO P-MS)	CP-AES)			
Tier II Validation					
Holding Times		х		Х	
Reporting limits (units)		х		Х	
Blanks					
A. Method Blanks		х		Х	
B. Rinse Blanks		х		Х	
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		х		Х	
Matrix Spike Duplicate (MSD) %R		x		Х	
MS/MSD Precision (RPD)		х		Х	
Laboratory Duplicate Sample (RPD)		х	Х		
Field Duplicate Sample (RPD)		х		Х	
ICP Serial Dilution %D	Х				Х
Reporting Limit Verification		X		Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha M

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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Matrix

Soil

TOTAL LEAD EPA 6010D

Units: mg/Kg (ppm)				Date	Date	
Analyte	Result	POI	Method	Prepared	Analyzed	Flags
Client ID:	SS-H-001-091823		motriou	Topurou	, analyzou	i lago
Laboratory ID:	09-168-01					
Lead	21 J	5.0	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-002-091823					
Laboratory ID:	09-168-02					
Lead	27	5.4	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-003-091823					
Laboratory ID:	09-168-03	F 4		0.40.00	0.40.00	
Lead	27	5.1	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-004-091823					
Laboratory ID:	09-168-04					
Lead	43	5.5	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-005-091823					
Laboratory ID:	09-168-05					
Lead	52	5.3	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-006-091823					
Laboratory ID:	09-168-06					
Lead	23	5.3	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-007-091823					
Laboratory ID:	09-168-07					
Lead	33	5.3	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-008-091823					
Laboratory ID:	09-168-08					
Lead	61	5.3	EPA 6010D	9-19-23	9-19-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-H-009-091823					
Laboratory ID:	09-168-09					
Lead	28	5.3	EPA 6010D	9-19-23	9-19-23	
	SS-H-010-091823					
Laboratory ID:	09-168-10				0.40.00	
Lead	23	5.5	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-011-091823					
Laboratory ID:	09-168-11					
Lead	29	5.5	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-012-091823					
Laboratory ID:	09-168-12					
Lead	51	5.5	EPA 6010D	9-19-23	9-19-23	
Client ID:	SS-H-013-091823					
Laboratory ID:	09-168-13					
Lead	72	5.4	EPA 6010D	9-19-23	9-19-23	
Client ID:	EB-H-001-091823					
Laboratory ID:	09-168-14					
Lead	22	5.1	EPA 6010D	9-19-23	9-19-23	
Client ID:	FB-H-002-091823					
Laboratory ID:	09-168-15					
Lead	24	5.2	EPA 6010D	9-19-23	9-19-23	
-			····			
Client ID:	EB-H-003-091823					
Laboratory ID:	09-168-16					
Lead	39	5.3	EPA 6010D	9-19-23	9-19-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-H-004-091823					
Laboratory ID:	09-168-17					
Lead	30	5.2	EPA 6010D	9-19-23	9-19-23	
Oliant ID:						
	EB-H-UU5-U91823					
Laboratory ID:	09-168-18	5.0		0.40.00	0.40.00	
Lead	160	5.2	EPA 6010D	9-19-23	9-19-23	
Client ID:	EB-H-006-091823					
Laboratory ID:	09-168-19					
Lead	74	5.2	EPA 6010D	9-19-23	9-19-23	
Client ID:	EB-H-007-091823					
Laboratory ID:	09-168-20					
Lead	74	5.2	EPA 6010D	9-19-23	9-19-23	
Client ID:	EB-H-009-091823					
Laboratory ID:	09-168-21					
Lead	250	5.4	EPA 6010D	9-19-23	9-19-23	
Client ID:	EB-H-010-091823					
Laboratory ID:	09-168-22					
Lead	120	5.4	EPA 6010D	9-19-23	9-19-23	
Client ID:	DUP-009-091823					
Laboratory ID:	09-168-24					
Lead	16	5.2	EPA 6010D	9-19-23	9-19-23	
		-				
Client ID:	DUP-010-091823					
Laboratory ID:	09-168-25					
Lead	120	5.5	EPA 6010D	9-19-23	9-19-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	DUP-011-091823					
Laboratory ID:	09-168-27					
Lead	19	5.2	EPA 6010D	9-19-23	9-19-23	

Client ID:	EB-H-008-091823					
Laboratory ID:	09-168-28					
Lead	230	5.2	EPA 6010D	9-19-23	9-19-23	



TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-008-091823					
Laboratory ID:	09-168-26					
Lead	ND	1.1	EPA 200.8	9-19-23	9-19-23	



% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
SS-H-001-091823	09-168-01	0	9-19-23
SS-H-002-091823	09-168-02	8	9-19-23
SS-H-003-091823	09-168-03	1	9-19-23
SS-H-004-091823	09-168-04	10	9-19-23
SS-H-005-091823	09-168-05	6	9-19-23
SS-H-006-091823	09-168-06	6	9-19-23
SS-H-007-091823	09-168-07	6	9-19-23
SS-H-008-091823	09-168-08	5	9-19-23
SS-H-009-091823	09-168-09	6	9-19-23
SS-H-010-091823	09-168-10	9	9-19-23
SS-H-011-091823	09-168-11	9	9-19-23
SS-H-012-091823	09-168-12	10	9-19-23
SS-H-013-091823	09-168-13	7	9-19-23
EB-H-001-091823	09-168-14	3	9-19-23
EB-H-002-091823	09-168-15	5	9-19-23
EB-H-003-091823	09-168-16	5	9-19-23
EB-H-004-091823	09-168-17	5	9-19-23
EB-H-005-091823	09-168-18	5	9-19-23
EB-H-006-091823	09-168-19	4	9-19-23
EB-H-007-091823	09-168-20	4	9-19-23
EB-H-009-091823	09-168-21	8	9-19-23
EB-H-010-091823	09-168-22	8	9-19-23
DUP-009-091823	09-168-24	3	9-19-23
DUP-010-091823	09-168-25	8	9-19-23
DUP-011-091823	09-168-27	5	9-19-23
EB-H-008-091823	09-168-28	4	9-19-23

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United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Metal Analysis

SDG # 2309-187

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51782R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-187 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Motrix	Sample	Percent Comple	Analysis
Sample ID		IVIALITX	Date		Metals
SS-H-014-091923	09-187-01	Soil	09/19/2023		Х
SS-H-015-091923	09-187-02	Soil	09/19/2023		Х
SS-H-016-091923	09-187-03	Soil	09/19/2023		Х
SS-H-017-091923	09-187-04	Soil	09/19/2023		Х
SS-H-018-091923	09-187-05	Soil	09/19/2023		Х
SS-H-019-091923	09-187-06	Soil	09/19/2023		Х
SS-H-020-091923	09-187-07	Soil	09/19/2023		Х
SS-H-021-091923	09-187-08	Soil	09/19/2023		Х
SS-H-022-091923	09-187-09	Soil	09/19/2023		Х
SS-H-023-091923	09-187-10	Soil	09/19/2023		Х
SS-H-024-091923	09-187-11	Soil	09/19/2023		Х
SS-H-025-091923	09-187-12	Soil	09/19/2023		Х
EB-H-011-091923	09-187-13	Soil	09/19/2023		Х
EB-H-012-091923	09-187-14	Soil	09/19/2023		Х
EB-H-013-091923	09-187-15	Soil	09/19/2023		Х
EB-H-014-091923	09-187-16	Soil	09/19/2023		Х
EB-H-015-091923	09-187-17	Soil	09/19/2023		Х
EB-H-016-091923	09-187-18	Soil	09/19/2023		Х
EB-H-017-091923	09-187-19	Soil	09/19/2023		Х
EB-H-018-091923	09-187-20	Soil	09/19/2023		Х
EB-H-019-091923	09-187-21	Soil	09/19/2023		Х
EB-H-020-091923	09-187-22	Soil	09/19/2023		Х
DUP-012-091923	09-187-23	Soil	09/19/2023	SS-H-014-091923	Х
DUP-013-091923	09-187-24	Soil	09/19/2023	EB-H-012-091923	Х
RS-009-091923	09-187-25	Water	09/19/2023		X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed		Reported		Performance Acceptable		Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		x		Х	
12.	Data Package Completeness and Compliance		Х		Х	

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

4

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed for lead on samples SS-H-020-091923, EB-H-013-091923 and RS-009-091923. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil and water matrices is applied when the criteria above is true. In the instance when the parent and/or

duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed for lead on samples SS-H-020-091923, EB-H-013-091923 and RS-009-091923. The laboratory duplicate analysis exhibited RPDs within the control limits with the exception noted below.

Sample ID	Analytes	Laboratory RPD		
SS-H-020-091923	Lead	28 %		

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to the all-sample results associated with this SDG.

Sample Concentration Control Limit		Sample Result	Qualification
Parent sample and laboratory sample	Soil 20%	Non-detect	UJ
concentration >5 times detection limit	501 20 %	Detect	J
Parent sample and/or laboratory Water one times R		Non-detect	UJ
RL and difference between samples >RL	Soil two times RL	Detect	J

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-H-014-091923/ DUP-012-091923	Lead	270	6300	183.6%
EB-H-012-091923 / DUP-013-091923	Lead	60	83	32.2%

Note:

AC Acceptable

The analyte Lead was associated with sample SS-H-014-091923 and DUP-012-091923 exhibited a field duplicate RPD greater than the control limit. The associated sample results from sample locations for the listed analyte were qualified as estimated.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D and EPA 200.8		Reported		rmance ptable	Not	
		Yes	No	Yes	Required	
Inductively Coupled Plasma - Atomic Emission Spectr Inductively Coupled Plasma - Mass Spectrometry (ICF	rometry (I P-MS)	CP-AES)				
Tier II Validation						
Holding Times		Х		Х		
Reporting limits (units)		Х		Х		
Blanks						
A. Method Blanks		Х		Х		
B. Rinse Blanks		Х		Х		
Laboratory Control Sample (LCS) %R	Х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD Precision (RPD)	Х				Х	
Matrix Spike (MS) %R		Х		Х		
Matrix Spike Duplicate (MSD) %R		Х		Х		
MS/MSD Precision (RPD)		Х		Х		
Laboratory Duplicate Sample (RPD)		Х	Х			
Field Duplicate Sample (RPD)		Х	Х			
ICP Serial Dilution %D	Х				Х	
Reporting Limit Verification		X		Х		

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha M

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS





Chain of Custody

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Chain of Custody

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Lab ID	Sa	mple Identification	Date Sampled	Time Sampled	Matrix	Numbe	NWTPH	NWTPH	NWTPH	NWTPH	Volatile	Haloger	EDB EP	Semivo (with lov	PAHs 8	PCBs 8	Organo	Organo	Chlorina	Total RC	Total M	TCLP N	HEM (oi	Tota		% Moist	10 111-11-
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Matrix:	Soil
Units:	mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-H-014-091923					
Laboratory ID:	09-187-01					
Lead	270 J	5.3	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-015-091923					
Laboratory ID:	09-187-02					
Lead	440 J	5.5	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-016-091923					
Laboratory ID.	09-187-03					
Lead	330 J	57	EPA 6010D	9-20-23	9-20-23	
		0.1		0 20 20	0 20 20	
Client ID:	SS-H-017-091923					
Laboratory ID:	09-187-04					
Lead	210	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-018-091923					
Laboratory ID:	09-187-05					
Lead	470 J	5.5	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-019-091923					
Laboratory ID:	09-187-06					
Lead	209 J	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-020-091923					
Laboratory ID:	09-187-07					
Lead	200 <mark>J</mark>	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-021-091923					
Laboratory ID:	09-187-08			0.00.00		
Lead	83 J	5.3	EPA 6010D	9-20-23	9-20-23	



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Matrix:	Soil
Units:	mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-H-022-091923					
Laboratory ID:	09-187-09					
Lead	63 J	5.3	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-023-091923					
Laboratory ID:	09-187-10					
Lead	79 ^J	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-024-091923					
Laboratory ID:	09-187-11					
Lead	120 J	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	SS-H-025-091923					
Laboratory ID:	09-187-12					
Lead	71 J	5.3	EPA 6010D	9-20-23	9-20-23	
Client ID:	EB-H-011-091923					
Laboratory ID:	09-187-13					
Lead	720	5.8	EPA 6010D	9-20-23	9-20-23	
Client ID:	EB-H-012-091923					
Laboratory ID:	09-187-14					
Lead	60	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	EB-H-013-091923					
Laboratory ID:	09-187-15					
Lead	35	5.4	EPA 6010D	9-20-23	9-20-23	
Client ID:	EB-H-014-091923					
Laboratory ID:	09-187-16					
Lead	250	5.1	EPA 6010D	9-20-23	9-20-23	



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4

Matrix: Soil						
Units: mg/Kg (ppm)				D .(D .(1)	
A 1	D	501		Date	Date	-
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-H-015-091923					
Laboratory ID:	09-187-17					
Lead	31	5.5	EPA 6010D	9-20-23	9-20-23	
Client ID:						
	со-107 10 00 107 10					
	09-167-16	5.0		0.00.00	0.00.00	
Lead	7.0	5.2	EPA 6010D	9-20-23	9-20-23	
Client ID:	FB-H-017-091923					
Laboratory ID.	09-187-19					
Lead	39	53	FPA 6010D	9-20-23	9-20-23	
2000		0.0		0 20 20	0 20 20	
Client ID:	EB-H-018-091923					
Laboratory ID:	09-187-20					
Lead	160	5.6	EPA 6010D	9-20-23	9-20-23	
Client ID:	EB-H-019-091923					
Laboratory ID:	09-187-21					
Lead	38	5.3	EPA 6010D	9-20-23	9-20-23	
Client ID:	EB-H-020-091923					
Laboratory ID:	09-187-22					
Lead	59	5.3	EPA 6010D	9-20-23	9-20-23	
Client ID:	DUP-012-091923					
Laboratory ID:	09-187-23					
Lead	6300 J	53	EPA 6010D	9-20-23	9-21-23	
Client ID:	DUP-013-091923					
	00 107 01					

 Laboratory ID:
 09-187-24

 Lead
 83
 5.5
 EPA 6010D
 9-20-23
 9-20-23



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TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-009-091923					
Laboratory ID:	09-187-25					
Lead	ND	1.1	EPA 200.8	9-21-23	9-21-23	



% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
SS-H-014-091923	09-187-01	6	9-20-23
SS-H-015-091923	09-187-02	8	9-20-23
SS-H-016-091923	09-187-03	12	9-20-23
SS-H-017-091923	09-187-04	7	9-20-23
SS-H-018-091923	09-187-05	9	9-20-23
SS-H-019-091923	09-187-06	7	9-20-23
SS-H-020-091923	09-187-07	8	9-20-23
SS-H-021-091923	09-187-08	6	9-20-23
SS-H-022-091923	09-187-09	6	9-20-23
SS-H-023-091923	09-187-10	7	9-20-23
SS-H-024-091923	09-187-11	7	9-20-23
SS-H-025-091923	09-187-12	7	9-20-23
EB-H-011-091923	09-187-13	14	9-20-23
EB-H-012-091923	09-187-14	7	9-20-23
EB-H-013-091923	09-187-15	8	9-20-23
EB-H-014-091923	09-187-16	1	9-20-23
EB-H-015-091923	09-187-17	8	9-20-23
EB-H-016-091923	09-187-18	4	9-20-23
EB-H-017-091923	09-187-19	6	9-20-23
EB-H-018-091923	09-187-20	11	9-20-23
EB-H-019-091923	09-187-21	6	9-20-23
EB-H-020-091923	09-187-22	6	9-20-23
DUP-012-091923	09-187-23	6	9-20-23
DUP-013-091923	09-187-24	8	9-20-23



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United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Polychlorinated Biphenyls (PCBs), Diesel Range Organics (DRO) and Metal Analysis

SDG # 2309-210

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51783R Review Level: Tier II Project: 30092874.00004
SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-210 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Committee ID			Sample	Devent Court		S	
Sample ID		Matrix	Date	Parent Sample	РСВ	DRO	Metals
SS-F-001-092023	09-210-01	Soil	09/20/2023				Х
SS-F-002-092023	09-210-02	Soil	09/20/2023				Х
SS-F-003-092023	09-210-03	Soil	09/20/2023				Х
SS-F-004-092023	09-210-04	Soil	09/20/2023				Х
SS-F-005-092023	09-210-05	Soil	09/20/2023				Х
SS-F-006-092023	09-210-06	Soil	09/20/2023				Х
SS-F-007-092023	09-210-07	Soil	09/20/2023				Х
SS-F-008-092023	09-210-08	Soil	09/20/2023				Х
SS-F-009-092023	09-210-09	Soil	09/20/2023				Х
SS-F-010-092023	09-210-10	Soil	09/20/2023				Х
EB-F-001-092023	09-210-11	Soil	09/20/2023				Х
EB-F-002-092023	09-210-12	Soil	09/20/2023				Х
EB-F-003-092023	09-210-13	Soil	09/20/2023				Х
EB-F-004-092023	09-210-14	Soil	09/20/2023				Х
SS-P-001-092023	09-210-15	Soil	09/20/2023				Х
SS-P-002-092023	09-210-16	Soil	09/20/2023				Х
SS-P-003-092023	09-210-17	Soil	09/20/2023				Х
SS-P-004-092023	09-210-18	Soil	09/20/2023				Х
EB-P-001-092023	09-210-19	Soil	09/20/2023				Х
DUP-014-092023	09-210-20	Soil	09/20/2023	SS-P-001-092023			Х
DUP-015-092023	09-210-21	Soil	09/20/2023	SS-F-002-092023			Х
DUP-016-092023	09-210-22	Soil	09/20/2023	SS-F-003-092023			Х
DUP-017-092023	09-210-23	Soil	09/20/2023	SS-F-006-092023			Х
SS-K-008-092023	09-210-24	Soil	09/20/2023		Х	Х	Х
SS-K-009-092023	09-210-25	Soil	09/20/2023		Х	Х	Х
RS-010-092023	09-210-26	Water	09/20/2023				Х

Notes:

PCB – Polychlorinated Biphenyls. DRO – Diesel Range Organics

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Items Reviewed	Rep	orted	Perfor Acce	mance ptable	Not		
		No	Yes	No	Yes	Required		
1.	Sample receipt condition		Х		Х			
2.	Requested analyses and sample results		Х		Х			
3.	Master tracking list		Х		Х			
4.	Methods of analysis		Х		Х			
5.	Reporting limits		Х		Х			
6.	Sample collection date		Х		Х			
7.	Laboratory sample received date		Х		Х			
8.	Sample preservation verification (as applicable)		Х		Х			
9.	Sample preparation/extraction/analysis dates		Х		Х			
10.	Fully executed Chain-of-Custody (COC) form		Х		Х			
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		Х			
12.	Data Package Completeness and Compliance		Х		Х			

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ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8082A and NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected as unusable. The compound may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no

information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Soil	1 year from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Field duplicate sample was not analyzed for PCBs.

7. System Performance and Overall Assessment

The PCBs sample results were not qualified with the "P" qualifier by the laboratory therefore the dual column RPD results were assumed to be within the control limits.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

Posticidos: SW-846 8082A	Rep	oorted	Perfor Acce	mance otable	Not
	No	Yes	No	Yes	Required
Gas Chromatography/Electron Capture Detector (GC	/ECD)				
Tier II Validation					
Holding times		Х		Х	
Reporting limits (units)		Х		х	
Blanks					
A. Method blanks		Х		X	
B. Equipment and/or Field blanks	Х				Х
Laboratory Control Sample (LCS) %R		Х		Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD RPD	Х				Х
Field Duplicate Sample RPD	Х				Х
Surrogate Spike Recoveries		Х		Х	
Column %D \leq 40% (If dual column is performed for reporting - not confirmation)	Х				X
Dilution Factor	X				Х
Moisture Content		Х		X	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
NWTPH-Dx	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was not performed on samples from this SDG.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Field duplicate sample was not analyzed for DRO.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DRO

	Rep	orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Gas Chromatography/Flame Ionization Detector (GC/F	ID)				
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		Х		Х	
Blanks			-		
A. Method blanks		Х		Х	
B. Equipment/Field blanks	Х				Х
C. Trip blanks	Х				Х
Surrogates Accuracy (%R)		Х		Х	
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD RPD	Х				Х
Laboratory Duplicate Sample RPD	Х				Х
Field Duplicate Sample RPD					Х
Dilution Factor					Х

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6 °C;

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analyte were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS/MSD analysis was not performed on samples from this SDG.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis performed on sample SS-P-002-092023. The laboratory duplicate analysis does not exhibit acceptable RPD.

Sample ID	Analytes	Laboratory RPD
SS-P-002-092023	Lead	65 %

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to the all-sample results associated with this SDG.

Sample Concentration	Sample Concentration Control Limit				
Parent sample and laboratory sample Water 10% or		Non-detect	UJ		
concentration >5 times detection limit	Soil 20%	Detect	J		
Parent sample and/or laboratory	Water one times RL or	Non-detect	UJ		
RL and difference between samples >RL	Soil two times RL	Detect	J		

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Sample ID/Duplicate ID	Analyte	nalyte Sample Result Duplicate Result (mg/Kg) (mg/Kg)						
SS-P-001-092023/ DUP-014-092023	Lead	110	180	48.3 %				
SS-F-002-092023 / DUP-015-092023	Lead	350	470	29.3 %				
SS-F-003-092023/ DUP-016-092023	Lead	88	81	8.3 %				
SS-F-006-092023/ DUP-017-092023	Lead	190	110	53.3 %				

Results for duplicate samples are summarized in the following table.

The analyte lead associated with sample locations SS-F-006-092023 and DUP-017-092023 exhibited a field duplicate RPD greater than the control limit. The associated sample results from sample locations for the listed analyte were qualified as estimated.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D and EPA 200.8	Rep	orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spect Inductively Coupled Plasma - Mass Spectrometry (ICF	rometry (I P-MS)	CP-AES)			
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		X		Х	
Blanks					
A. Method Blanks		X		Х	
B. Rinse Blanks		X		Х	
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Duplicate Sample (RPD)		X	Х		
Field Duplicate Sample (RPD)		X	Х		
ICP Serial Dilution %D					Х
Reporting Limit Verification		Х		Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha M $\dot{}$

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS





Chain of Custody

-	Envire	e onmental Inc.			Ulla			υL	15		uy											P	age _	1	of _	3	_		18
	Analytical Lab 14648 NE 95	boratory Testing Services 5th Street • Redmond, WA 98052		Turr (in	naround Req working day	uest /s)		L	abo	orat	ory	Nu	mb	er:	n	9 -	-2	1	0			2							
Compa	Phone: (425) any: Arcad) 883-3881 · www.onsite-env.com		Same	(Check One) Day	Rush 1 Day													MIS/0										
Projec	306 9 2	2874.00003	2 Da		2 Days				260 [])									381	es 8270	8151					010)				
Projec	t Name: NSCG	Burrows Island			lard (7 Days)		LS		121		dn-u		8260	rs Only)	M	level)		cides 8	esticide	bicides				1664	1 (6				
Projec	t Manager: Paul	McCullough		_			ontaine		TEX (8(sG Clea		Volatiles	1 (Wate	8270/S	M (low-		le Pesti	horus P	cid Her	letals	letals		grease)	Lea				
Sampl	ed by: Bran	iden Joy			(other)		er of C	H-HCID	H-Gx/B	H-Gx	H-Dx (9	es 8260	enated \	PA 801	olatiles ow-leve	3270/SI	8082	ochlorir	dsoudd	nated A	ICRA M	ITCA N	Metals	oil and g	t 91			sture	
Lab ID	Sa	mple Identification	Dat Samp	e Ied	Time Sampled	Matrix	Numb	NWTP	NWTP	NWTP	NWTP	Volatile	Haloge	EDB E	Semive (with Id	PAHs 8	PCBs	Organo	Organo	Chlorir	Total F	Total N	TCLP	HEM (10			% Mois	10 1111
1	55-F-0	01-092023	9/20	123	1200	5	1																		X			>	0
2	55-F-0	02-092023	1		1205	5	1																		X				
3	55-F-0	003 - 092023			1210	Ś	1																		X				
4	55-F-0	04 - 092023			1215	5	1																		X				Γ
5	55 - F - 60	05 - 092023			1220	5	1																		X				
6	55 01	06-092023			1225	5	1																		X				
7	55-F-00	07-092023			1230	5	1																		X				
8	55-F-00	18 - 092023			1235	5	1																		X				
9	55-F-00	09 - 092023			1240	5	1																		X				
10	55-F-01	10 - 09 20 23	1		1245	5	1																		X				
		Signature		Co	ompany				Dat	te		Tim	e		Coi	nmen	its/Sp	ecial	Instr	uctio	ns								
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1Site Environmental Inc

Chain of Custody

	e nmental Inc.		GNa		T	ι	ISI	[0	ay											Pa	age _	2	of_	3		
Analytical Lab 14648 NE 95	oratory Testing Services 5th Street • Redmond, WA 98052	Tui (i	rnaround Req n working da	uest ys)		L	abc	orat	ory	Nu	umk	oer:	M	g -	-2	1	0									
Phone: (425) Company: Arcad) 883-3881 • www.onsite-env.com d 15	🗌 Sam	(Check One) e Day	Rush X 1 Day													WIS/02									
Project Name: WSCG Project Manager:	Burrows Island	2 Da	ys dard (7 Days)	3 Days	ainers		X (8021 8260		Clean-up 🗍		atiles 8260	Naters Only)	70/SIM AHs)	(low-level)		^b esticides 8081	us Pesticides 82	Herbicides 8151	als	als		ase) 1664	ad (6010)	A		
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Lab ID Sa	mple Identification	Date Sampled	Time Sampled	Matrix	Numbe	NWTPI	NWTPI	NWTPI	NWTPI	Volatile	Haloge	EDB E	Semivo (with Io	PAHs 8	PCBs {	Organo	Organo	Chlorin	Total R	Total N	TCLP	HEM (c	Tot	Ś		% Mois
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11 EB-F-00	1-092023	9/20/23	1250	S	l																		Х			p
12 EB-F-00	2-092023	1	1255	5	Ĭ																		Х			
13 EB-F-00	3 - 092023		1300	5	1																		Х			T
14 EB-F-00	4 - 092023		1305	5	8																		X			Π
15 55-P-001	- 092023		1400	5	1																		X			
16 55-P-002	-092023		1405	5	3																		X	X		
17 55-P-003	- 092023		1410	5	¥																		Х			
18 55-P-004	-092023		1415	5	ł																		Х			$\left \right $
19 ESS EB-P-	001-092023	\downarrow	1420	5	1																		Х			V
	Signature	C	ompany				Dat	e		Tin	ne		Co	mmer	nts/Sp	ecial	Instr	ructio	ns		_					
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Chain of Custody

Page <u>3</u> of <u>3</u>

	Analytical Lab 14648 NE 95	Dentation Services 5th Street • Redmond, WA 98052	Turnaround Request (in working days) Laboratory Number: 79 - 210																									
Compar	Phone: (425) hy: AirCa) 883-3881 · www.onsite-env.com	- 	(Check One	RVSh X 1 Day													SIM								XQ		
Project	Number: 300 4	12874.00003		Days	3 Days			560[])									181	s 8270/	3151					(0		TPH.		
Project	Name: USCG	Burrows Island	Sta	andard (7 Days)		r's		121		(] dn-u		8260	rs Only)	Σ	level)		cides 80	esticide	oicides 8				1664	601	(23)	MN		
Project	Manager: Paul	McCullough				ontaine		3TEX (80		SG Clea		Volatiles	1 (Wate	8270/SI	-wol) MI		ne Pesti	horus P	cid Herl	fetals	Aetals		grease)	ead.	(80	ha o	•	
Sample	d by: Bran	den Joy		(other)		er of C	H-HCII	H-Gx/E	H-Gx	H-Dx (es 8260	enated	EPA 801	olatiles ow-leve	8270/S	8082	ochlori	dsoydo	nated A	SCRA	NTCA N	Metals	oil and	al L	.8.	H/O		sture
Lab ID	Sa	mple Identification	Date Sample	Time d Sampled	Matrix	Numb	NWTF	NWTF	NWTF	NWTF	Volatil	Halog	EDBE	Semiv (with I	PAHs	PCBs	Organ	Organ	Chlori	Total F	Total N	TCLP	HEM	704	PC	06		% Moi
20	DUP-01	4-092023	9/20/2	3 -	5	1																		X				φ
21	PUP-01	5-092023		-	5	1																		X				1
22	DUP-01	6-092023		1	5	۱																		X				T
23	DUP-01	7-092023		-	S	1																		X				Γ
24	55-K-00	08-092023		1600	5	ę																		X	X	X		-
25	55-K-00	09-092023	V	1605	\$	1																		Х	X	X		1
26	R5-010-	- 092023	9/20/2	3 1100	W	1																		X				J
		Signature		Company				Dat	e		Tim	e		Cor	nmen	its/Sp	ecial	Instr	uctio	ons								
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Revie	wed/Date			Reviewed/D	ate									Chromatograms with final report 🗌 Electronic Data Deliverables (EDDs) 🗌]									

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-F-001-092023					
Laboratory ID:	09-210-01					
Lead	220	5.4	EPA 6010D	9-21-23	9-21-23	
Client ID:	SS-F-002-092023					
Laboratory ID:	09-210-02					
Lead	350	5.6	EPA 6010D	9-21-23	9-21-23	
Client ID:	SS-F-003-092023					
Laboratory ID:	09-210-03					
Lead	88	5.4	EPA 6010D	9-21-23	9-21-23	
Client ID:	SS-F-004-092023					
Laboratory ID:	09-210-04					
Lead	170	5.6	EPA 6010D	9-21-23	9-21-23	
Client ID:	SS E 005 002022					
	00 210 05					
	<u> </u>	57		0_21_23	0_21_23	
Leau	250	5.7	EFA 0010D	9-21-23	9-21-25	
Client ID:	SS-F-006-092023					
Laboratory ID:	09-210-06					
Lead	190 J	5.5	EPA 6010D	9-21-23	9-21-23	
Client ID:	SS-F-007-092023					
Laboratory ID:	09-210-07					
Lead	78	5.3	EPA 6010D	9-21-23	9-21-23	
Client ID:	SS-F-008-092023					
Laboratory ID:	09-210-08					
Lead	210	5.6	EPA 6010D	9-21-23	9-21-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-F-009-092023					
Laboratory ID:	09-210-09					
Lead	250	5.7	EPA 6010D	9-21-23	9-22-23	
Client ID:	SS E 040 002022					
	00 210 10					
	09-210-10	E A		0.01.02	0.00.00	
Leau	00	5.4	EPA 6010D	9-21-23	9-22-23	
Client ID:	EB-F-001-092023					
Laboratory ID:	09-210-11					
Lead	13	5.7	EPA 6010D	9-21-23	9-22-23	
Client ID:						
	EB-F-002-092023					
Laboratory ID:	09-210-12	5.0		0.04.00	0.00.00	
Lead	85	5.6	EPA 6010D	9-21-23	9-22-23	
Client ID:	EB-F-003-092023					
Laboratory ID:	09-210-13					
Lead	82	5.4	EPA 6010D	9-21-23	9-22-23	
Client ID:	EB-F-004-092023					
Laboratory ID:	09-210-14					
Lead	43	5.6	EPA 6010D	9-21-23	9-22-23	
Client ID:	SS-P-001-092023					
Laboratory ID:	09-210-15					
Lead	110	5.3	EPA 6010D	9-21-23	9-22-23	
Client ID:	SS-P-002-092023					
Laboratory ID:	09-210-16					
Lead	240 J	5.3	EPA 6010D	9-21-23	9-21-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-P-003-092023					
Laboratory ID:	09-210-17					
Lead	44	5.5	EPA 6010D	9-21-23	9-22-23	
Client ID:	SS D 004 002022					
	00 210 19					
	09-210-10	E 0		0.01.02	0.00.00	
Lead	42	5.3	EPA 6010D	9-21-23	9-22-23	
Client ID:	EB-P-001-092023					
Laboratory ID:	09-210-19					
Lead	6.7	5.4	EPA 6010D	9-21-23	9-22-23	
Client ID:	DUP-014-092023					
Laboratory ID:	09-210-20					
Lead	180	5.3	EPA 6010D	9-21-23	9-22-23	
Client ID:	DUP-015-092023					
Laboratory ID:	09-210-21					
Lead	470	5.7	EPA 6010D	9-21-23	9-22-23	
Client ID:	DUP-016-092023					
Laboratory ID:	09-210-22					
Lead	81	5.6	EPA 6010D	9-21-23	9-22-23	
Client ID:	DUP-017-092023					
Laboratory ID:	09-210-23					
Lead	110 J	5.5	FPA 6010D	9-21-23	9-22-23	
Client ID:	SS-K-008-092023					
Laboratory ID:	09-210-24					
Lead	110	5.3	EPA 6010D	9-21-23	9-22-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-K-009-092023					
Laboratory ID:	09-210-25					
Lead	120	5.3	EPA 6010D	9-21-23	9-22-23	



TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-010-092023					
Laboratory ID:	09-210-26					
Lead	ND	1.1	EPA 200.8	9-21-23	9-21-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

PCBs EPA 8082A

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-K-008-092023					
Laboratory ID:	09-210-24					
Aroclor 1016	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1260	0.25	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	82	50-127				
Client ID:	SS-K-009-092023					
Laboratory ID:	09-210-25					
Aroclor 1016	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1260	0.58	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-22-23	9-22-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	85	50-127				

DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

0 0 (11)				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-K-008-092023					
Laboratory ID:	09-210-24					
Diesel Range Organics	ND	27	NWTPH-Dx	9-22-23	9-22-23	
Lube Oil Range Organics	ND	53	NWTPH-Dx	9-22-23	9-22-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	78	50-150				
Client ID:	SS-K-009-092023					

Laboratory ID:	09-210-25					
Diesel Range Organics	ND	27	NWTPH-Dx	9-22-23	9-22-23	
Lube Oil	66	53	NWTPH-Dx	9-22-23	9-22-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	77	50-150				



% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
SS-F-001-092023	09-210-01	7	9-21-23
SS-F-002-092023	09-210-02	10	9-21-23
SS-F-003-092023	09-210-03	7	9-21-23
SS-F-004-092023	09-210-04	11	9-21-23
SS-F-005-092023	09-210-05	12	9-21-23
SS-F-006-092023	09-210-06	8	9-21-23
SS-F-007-092023	09-210-07	6	9-21-23
SS-F-008-092023	09-210-08	11	9-21-23
SS-F-009-092023	09-210-09	13	9-21-23
SS-F-010-092023	09-210-10	8	9-21-23
EB-F-001-092023	09-210-11	12	9-21-23
EB-F-002-092023	09-210-12	11	9-21-23
EB-F-003-092023	09-210-13	7	9-21-23
EB-F-004-092023	09-210-14	11	9-21-23
SS-P-001-092023	09-210-15	5	9-21-23
SS-P-002-092023	09-210-16	5	9-21-23
SS-P-003-092023	09-210-17	9	9-21-23
SS-P-004-092023	09-210-18	5	9-21-23
EB-P-001-092023	09-210-19	7	9-21-23
DUP-014-092023	09-210-20	6	9-21-23
DUP-015-092023	09-210-21	13	9-21-23
DUP-016-092023	09-210-22	11	9-21-23
DUP-017-092023	09-210-23	9	9-21-23
SS-K-008-092023	09-210-24	6	9-21-23
SS-K-009-092023	09-210-25	6	9-21-23



United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Metal Analysis

SDG # 2309-274

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51784R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-274 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Motrix	Sample	Parent	Analysis
Sample ID		WIGUIX	Date	Sample	Metals
SS-H-029-092523	09-274-01	Soil	09/26/2023		Х

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed		Reported		Performance Acceptable		Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		x		х	
12.	Data Package Completeness and Compliance		Х		Х	

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation	
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C	

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed on sample SS-H-029-092523 for Lead. The MS/MSD analysis exhibited recovery and RPD within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed for lead on sample SS-H-029-092523. The laboratory duplicate analysis exhibited RPD within the control limits.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

LCS results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

A field duplicate sample was not collected within this SDG.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D		Reported		mance ptable	Not				
		Yes	No	Yes	Required				
Inductively Coupled Plasma - Atomic Emission Spectrometry (ICP-AES)									
Tier II Validation									
Holding Times		х		Х					
Reporting limits (units)		Х		Х					
Blanks									
A. Method Blanks		Х		Х					
B. Equipment/Field Blanks	X				Х				
Laboratory Control Sample (LCS) %R					Х				
Laboratory Control Sample Duplicate (LCSD) %R					Х				
LCS/LCSD Precision (RPD)					Х				
Matrix Spike (MS) %R		Х		Х					
Matrix Spike Duplicate (MSD) %R		х		Х					
MS/MSD Precision (RPD)		Х		Х					
Laboratory Duplicate Sample (RPD)		Х		Х					
Field Duplicate Sample (RPD)	х				Х				
ICP Serial Dilution %D	X				Х				
Reporting Limit Verification		Х		Х					

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha M

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023
CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-H-029-092523					
Laboratory ID:	09-274-01					
Lead	47	5.7	EPA 6010D	9-26-23	9-26-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881



United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Metal Analysis

SDG # 2309-238

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51785R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-238 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Osmarla ID			Sample	Demonst Opennuls	Analysis
Sample ID	Lab ID	Matrix	Date	Parent Sample	Metals
EB-F-007-092423	09-238-01	Soil	09/24/2023		х
SS-F-011-092423	09-238-02	Soil	09/24/2023		Х
SS-F-012-092423	09-238-03	Soil	09/24/2023		Х
SS-F-013-092423	09-238-04	Soil	09/24/2023		Х
SS-F-014-092423	09-238-05	Soil	09/24/2023		Х
SS-F-015-092423	09-238-06	Soil	09/24/2023		Х
SS-F-016-092423	09-238-07	Soil	09/24/2023		Х
DUP-018-092423	09-238-08	Soil	09/24/2023	EB-H-022-092423	Х
DUP-019-092423	09-238-09	Soil	09/24/2023	EB-H-023-092423	Х
RS-011-092423	09-238-10	Water	09/24/2023		Х
EB-H-021-092323	09-238-11	Soil	09/23/2023		Х
SS-H-026-092323	09-238-12	Soil	09/23/2023		Х
SS-H-027-092323	09-238-13	Soil	09/23/2023		Х
EB-H-022-092423	09-238-14	Soil	09/24/2023		х
EB-H-023-092423	09-238-15	Soil	09/24/2023		Х
EB-H-024-092423	09-238-16	Soil	09/24/2023		Х
EB-H-025-092423	09-238-17	Soil	09/24/2023		х
SS-H-028-092423	09-238-18	Soil	09/24/2023		Х
EB-F-005-092423	09-238-19	Soil	09/24/2023		Х
EB-F-006-092423	09-238-20	Soil	09/24/2023		Х

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Items Reviewed	Rep	orted	Perfor Acce	mance ptable	Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х	Х		
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		Х	
12.	Data Package Completeness and Compliance		Х		Х	

Note:

10. The samples WC-012-092223 and WC-013-092223 (wood samples) are listed in COC, however the sample was not analyzed by the laboratory.

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
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 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed for lead on samples EB-H-023-092423 and RS-011-092423 for Lead. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed for lead on samples EB-H-023-092423 and RS-011-092423. The laboratory duplicate analysis exhibited RPDs within the control limits.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
EB-H-022-092423 / DUP-018-092423	Lead	8.6	10	AC
EB-H-023-092423 / DUP-019-092423	Lead	14	6.0	AC

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D and EPA 200 8	Rep	orted	Perfor Acce	mance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spect Inductively Coupled Plasma - Mass Spectrometry (ICF	rometry (I P-MS)	CP-AES)			
Tier II Validation					
Holding Times		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method Blanks		Х		Х	
B. Rinse		Х		Х	
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		Х		Х	
Matrix Spike Duplicate (MSD) %R		Х		Х	
MS/MSD Precision (RPD)		Х		Х	
Laboratory Duplicate Sample (RPD)		Х		Х	
Field Duplicate Sample (RPD)		Х		Х	
ICP Serial Dilution %D	Х				Х
Reporting Limit Verification		Х		Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha M $\dot{}$

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



OnSite Environmental Inc.

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Chain of Custody



Analytical Laboratory Testing Services

Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052	Turnaround Request (in working days)											0	9 -	2	38	3									
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Chain of Custody



Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052	Turnaround Request (in working days) Laboratory Number: $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$										9.	- 2	3	8												
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OnSite Environmental Inc.

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Chain of Custody

Page _ 3 _ of _ 3 _

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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-F-007-092423					
Laboratory ID:	09-238-01					
Lead	18	5.5	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-F-011-092423					
Laboratory ID:	09-238-02					
Lead	120	5.8	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-F-012-092423					
Laboratory ID:	09-238-03					
Lead	88	5.3	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-F-013-092423					
Laboratory ID:	09-238-04					
Lead	150	5.4	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-F-014-092423					
Laboratory ID:	09-238-05					
Lead	94	5.6	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-F-015-092423					
Laboratory ID:	09-238-06					
Lead	47	6.0	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-F-016-092423					
Laboratory ID:	09-238-07					
Lead	65	5.5	EPA 6010D	9-25-23	9-25-23	
Client ID:	DUP-018-092423					
Laboratory ID:	09-238-08					
Lead	10	5.4	EPA 6010D	9-25-23	9-25-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	DUP-019-092423					
Laboratory ID:	09-238-09					
Lead	6.0	5.5	EPA 6010D	9-25-23	9-25-23	
Client ID:	EB-H-021-092323					
Laboratory ID:	09-238-11					
Lead	ND	5.6	EPA 6010D	9-25-23	9-25-23	
Client ID:	SS-H-026-092323					
Laboratory ID:	09-238-12					
Lead	79	5.9	EPA 6010D	9-25-23	9-25-23	
Client ID:	66 H 037 003333					
	55-H-U27-U92323					
Laboratory ID:	09-238-13	F 7		0.05.00	0.05.00	
Lead	52	5.7	EPA 6010D	9-25-23	9-25-23	
Client ID:	EB-H-022-092423					
Laboratory ID:	09-238-14					
Lead	8.6	5.4	EPA 6010D	9-25-23	9-25-23	
	EB-H-023-092423					
Laboratory ID:	09-238-15					
Lead	14	5.4	EPA 6010D	9-25-23	9-25-23	
Client ID:	EB-H-024-092423					
Laboratory ID:	09-238-16					
Lead	90	5.5	EPA 6010D	9-25-23	9-25-23	
Client ID:						
	09-238-17	EF		0.05.00	0.05.00	
read	100	5.5	EPA 6010D	9-20-23	9-20-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-H-028-092423					
Laboratory ID:	09-238-18					
Lead	100	5.6	EPA 6010D	9-25-23	9-25-23	
Client ID:	EB-F-005-092423					
Laboratory ID:	09-238-19					
Lead	45	5.4	EPA 6010D	9-25-23	9-25-23	
Client ID:	EB-F-006-092423					
Laboratory ID:	09-238-20					
Lead	38	5.4	EPA 6010D	9-25-23	9-25-23	



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TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-011-092423					
Laboratory ID:	09-238-10					
Lead	ND	1.1	EPA 200.8	9-25-23	9-25-23	



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% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
EB-F-007-092423	09-238-01	10	9-25-23
SS-F-011-092423	09-238-02	14	9-25-23
SS-F-012-092423	09-238-03	6	9-25-23
SS-F-013-092423	09-238-04	8	9-25-23
SS-F-014-092423	09-238-05	10	9-25-23
SS-F-015-092423	09-238-06	17	9-25-23
SS-F-016-092423	09-238-07	9	9-25-23
DUP-018-092423	09-238-08	8	9-25-23
DUP-019-092423	09-238-09	9	9-25-23
EB-H-021-092323	09-238-11	10	9-25-23
SS-H-026-092323	09-238-12	15	9-25-23
SS-H-027-092323	09-238-13	13	9-25-23
EB-H-022-092423	09-238-14	8	9-25-23
EB-H-023-092423	09-238-15	7	9-25-23
EB-H-024-092423	09-238-16	9	9-25-23
EB-H-025-092423	09-238-17	9	9-25-23
SS-H-028-092423	09-238-18	10	9-25-23
EB-F-005-092423	09-238-19	8	9-25-23
EB-F-006-092423	09-238-20	7	9-25-23



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United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Metal Analysis

SDG # 2309-154

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51786R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-154 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Comula ID		Matuise	Sample	Denout Commis	Analysis
Sample ID		Matrix	Date	Parent Sample	Metals
SS-I-001-091623	09-154-01	Soil	09/16/2023		х
SS-I-002-091623	09-154-02	Soil	09/16/2023		Х
SS-I-003-091623	09-154-03	Soil	09/16/2023		Х
SS-I-004-091623	09-154-04	Soil	09/16/2023		Х
SS-I-005-091623	09-154-05	Soil	09/16/2023		х
EB-I-001-091623	09-154-06	Soil	09/16/2023		х
EB-I-002-091623	09-154-07	Soil	09/16/2023		Х
EB-I-003-091623	09-154-08	Soil	09/16/2023		Х
DUP-007-091623	09-154-09	Soil	09/16/2023	SS-I-003-091623	Х
RS-006-091623	09-154-10	Water	09/16/2023		Х
SS-A-001-091723	09-154-11	Soil	09/17/2023		Х
SS-A-002-091723	09-154-12	Soil	09/17/2023		х
SS-A-003-091723	09-154-13	Soil	09/17/2023		Х
SS-A-004-091723	09-154-14	Soil	09/17/2023		х
EB-A-001-091723	09-154-15	Soil	09/17/2023		х
EB-A-002-091723	09-154-16	Soil	09/17/2023		Х
EB-A-003-091723	09-154-17	Soil	09/17/2023		Х
EB-B-001-091723	09-154-18	Soil	09/17/2023		Х
EB-C-001-091723	09-154-19	Soil	09/17/2023		Х
SS-C-001-091723	09-154-20	Soil	09/17/2023		Х
SS-C-002-091723	09-154-21	Soil	09/17/2023		Х
DUP-008-091723	09-154-22	Soil	09/17/2023	EB-A-003-091723	Х
RS-007-091623	09-154-23	Water	09/17/2023		X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Items Reviewed	Rep	orted	Perfoi Acce	rmance ptable	Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		X		x	
2.	Requested analyses and sample results		Х		X	
3.	Master tracking list		Х		X	
4.	Methods of analysis		Х		X	
5.	Reporting limits		Х		X	
6.	Sample collection date		Х	Х		
7.	Laboratory sample received date		Х		X	
8.	Sample preservation verification (as applicable)		Х		X	
9.	Sample preparation/extraction/analysis dates		Х		X	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		х	
12. Data Package Completeness and Compliance			Х		X	

Note:

Sample collection date for the samples from SS-A-001-091723 to DUP-008-091723 was not provided in the Chain of custody. However, sample collection date is considered as 09/17/2023 as mentioned in the sample ID.

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6 °C;

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analyte were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed for lead on samples SS-A-001-091723, EB-B-001-091723 and RS-006-091623. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed for lead on samples SS-A-001-091723, EB-B-001-091723 and RS-006-091623. The laboratory duplicate analysis exhibited RPDs within the control limits.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-I-003-091623 / DUP-007-091623	Lead	11	8.8	AC
EB-A-003-091723 / DUP-008-091723	Lead	7.9	7.8	AC
Note:				

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D and EPA 200.8	Rep	orted	Perfor Acce	mance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spect Inductively Coupled Plasma - Mass Spectrometry (ICP	ometry (I0 P-MS)	CP-AES)			
Tier II Validation					
Holding Times		X333		Х	
Reporting limits (units)		х		Х	
Blanks					
A. Method Blanks		х		Х	
B. Rinse Blanks		х		Х	
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	x				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		х		Х	
Matrix Spike Duplicate (MSD) %R		x		Х	
MS/MSD Precision (RPD)		х		Х	
Laboratory Duplicate Sample (RPD)		х		Х	
Field Duplicate Sample (RPD)		Х		Х	
ICP Serial Dilution %D	X				Х
Reporting Limit Verification		x		Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M ...

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



OnSite		Chain of Custody													Page 31 of 3									
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Project Number: 30092874.00003		ame Day Days	3 Days			([]09								81	s 8270/S	3151					ad lo			
Project Name: USCG Burrows Island] 🗆 s	tandard (7 Days)		IS)21□ 82		(dn-u	0900	00700	rs Only)	M level)		cides 80	esticides	oicides 8				1664	e le			
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Thomas Nannini		(other)		ber of C	PH-HCI	PH-Gx/I	PH-Gx	PH-Dx (lles 826	heliateu	EPA 80-	volatiles low-leve 8270/S	8082	nochlori	Isoudor	inated /	RCRA N	MTCA	Metals	(oil and	NIR			isture
Lab ID Sample Identification	Date Sampl	ed Sampled	Matrix	Num	NWT	TWN	TWN	TWN	Volat		EDB	Semi (with PAHs	PCBs	Orgai	Orgai	Chlor	Total	Total	TCLP	HEM	10			% Mc
1 35-I-001-091623	9/16/2	3 1100	9	1																	X			Ń
2-55-I-002-091623	911612	3 1105	5	1																	X			
3 55-I-003-04/623	9/16/2	3 1110	S	1																	X			
4-55-I-004-041623	9/16	23 11 15	S	1																	X			
5-55-I-005-091623	9/16/2	3 1120	5	1																	X			
6 EB-I-001-091623	9116	231125	S	1																	X			
7 EB-I-002-091623	9/16/2	13 1130	5	1																	X			
8 EB-T-003-091623	916	231135	S	1																	X			
9-Dup-007-91623	9/16	23 -	S	1																	X			
10 RS-005-091623	9/16/2	23 1620	\sim	1																	X			
Signature		Company				Date			Time			Comm	ents/S	pecia	l Insti	ructio	ns							
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OnSite	Chain of Custody													Page <u>42</u> of <u>53</u>																	
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Lab ID Sample Identification	Date Sampled	Time Sampled	Matrix	Numb	NWTP	NWTP	NWTP	NWTP	Volatile	Паю	EDBE	Semiv (with Ic	PAHs 8	PCBs	Organo	Organo	Chlorir	Total B	Total N	TCLP1	HEM (10+	Š		% Mois	70 1410					
11 55-A-001-091723		1045	5	2																		X	x		X	0					
1255-A-002-091723		1050	9	1																		Х				1					
13-55-A-007-091723		1055	5	1																		X									
14755-A-004-091723		100	S	1																		X									
15-EB-A-001-091723		1105	S	1																		Х									
16-EB-A-002-091723		1110	S	1																		Х				Π					
17-EB-A-003-091723		1115	S	1																		X				Π					
18-EB-B-001-091723		1120	S	.1																		X				T					
13- EB-C-001-091723		1125	5	1																		χ				Ţ.					
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Analytical Laboratory Testing Services 14648 NE 95th Street - Redmond, WA 98052	Chain of Cust						stody aboratory Number: <u>N9 - 1 5 4</u>						Page <u>5</u> of <u>5</u>											
Company: ACODIS Project Number: 30092374,00003 Project Name: USC G BARROWS ISLAND Project Manager: Project Manager: Project Manager: Project Manager:	Same	(Check One) e Day /s [dard (7 Days)	1 Day 3 Days	ontainers		TEX (8021 8260)		SG Clean-up [])		volatiles 8260	1 (Waters Only)	8270/SIM I PAHs)	M (low-level)	he Pesticides 8081	horus Pesticides 8270/SIM	cid Herbicides 8151	letals	letals		grease) 1664	b (6010)			
Lab ID Sample Identification	Date Sampled	(other) Time Sampled	Matrix	Number of C	NWTPH-HCIE	NWTPH-Gx/E	NWTPH-Gx	NWTPH-Dx (Volatiles 8260	Halogenated	EDB EPA 801	Semivolatiles (with low-leve	PAHs 8270/S PCBs 8082	Organochlori	Organophosp	Chlorinated A	Total RCRA N	Total MTCA N	TCLP Metals	HEM (oil and	Total P			% Moisture
21 55-6-002-091723		1135	5	1																	X			Ø
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Received Courier Service	¥	fread	15			91	18/2	13	06	60	>													
Relinquished																								
Received	5	d	NE			9	18	$ v\rangle$	2 1	24	(1)													
Relinquished										s done -														
		Decision 1/2										Data	Pack	age:	Stand	ard [Le	vel II		Leve	el IV □]		
Reviewed/Date Reviewed/Date								Chromatograms with final report Electronic Data Deliverables (EDDs)																

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-I-001-091623					
Laboratory ID:	09-154-01					
Lead	39	5.4	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-I-002-091623					
Laboratory ID.	09-154-02					
Lead	19	5.3	FPA 6010D	9-18-23	9-18-23	
		0.0		0 10 20	0 10 20	
Client ID:	SS-I-003-091623					
Laboratory ID:	09-154-03					
Lead	11	5.2	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-I-004-091623					
Laboratory ID:	09-154-04					
Lead	17	5.2	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-I-005-091623					
Laboratory ID:	09-154-05					
Lead	12	5.4	EPA 6010D	9-18-23	9-18-23	
Client ID:	EB-I-001-091623					
Laboratory ID:	09-154-06					
Lead	6.1	5.4	EPA 6010D	9-18-23	9-19-23	
Oliant ID:						
	EB-I-002-091623					
Laboratory ID:	09-154-07			0.40.00		
Lead	130	5.5	EPA 6010D	9-18-23	9-19-23	
Client ID:	EB-I-003-091623					
Laboratory ID:	09-154-08					
Lead	71	5.6	EPA 6010D	9-18-23	9-19-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	DUP-007-091623					
Laboratory ID:	09-154-09					
Lead	8.8	5.2	EPA 6010D	9-18-23	9-19-23	
0						
Client ID:	SS-A-001-091723					
Laboratory ID:	09-154-11					
Lead	29	5.4	EPA 6010D	9-18-23	9-18-23	
Client ID:	SS-A-002-091723					
Laboratory ID:	09-154-12					
Lead	15	5.3	EPA 6010D	9-18-23	9-19-23	
Client ID:	SS-A-003-091723					
Laboratory ID:	09-154-13					
Lead	15	5.6	EPA 6010D	9-18-23	9-19-23	
Client ID:	SS-A-004-091723					
Laboratory ID:	09-154-14					
Lead	6.6	5.2	EPA 6010D	9-18-23	9-19-23	
Client ID:	EB-A-001-091723					
Laboratory ID:	09-154-15					
Lead	100	5.6	EPA 6010D	9-18-23	9-19-23	
Client ID:	EB-A-002-091723					
Laboratory ID:	09-154-16					
Lead	50	5.5	EPA 6010D	9-18-23	9-19-23	
Client ID:	EB-A-003-091723					
Laboratory ID:	09-154-17			0.40.00	0.46.00	
Lead	7.9	5.4	EPA 6010D	9-18-23	9-19-23	



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Matrix: Soil Units: mg/Kg (ppm)

ed Flags
3
3
3
3
3



TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-006-091623					
Laboratory ID:	09-154-10					
Lead	ND	1.1	EPA 200.8	9-19-23	9-19-23	
Client ID:	RS-007-091723					
Laboratory ID:	09-154-23					

Laboratory ID.	03-10-23					
Lead	ND	1.1	EPA 200.8	9-19-23	9-19-23	


% MOISTURE

			Date
Client ID	Lab ID	% Moisture	Analyzed
SS-I-001-091623	09-154-01	8	9-18-23
SS-I-002-091623	09-154-02	5	9-18-23
SS-I-003-091623	09-154-03	4	9-18-23
SS-I-004-091623	09-154-04	4	9-18-23
SS-I-005-091623	09-154-05	8	9-18-23
EB-I-001-091623	09-154-06	7	9-18-23
EB-I-002-091623	09-154-07	9	9-18-23
EB-I-003-091623	09-154-08	10	9-18-23
DUP-007-091623	09-154-09	4	9-18-23
SS-A-001-091723	09-154-11	7	9-18-23
SS-A-002-091723	09-154-12	5	9-18-23
SS-A-003-091723	09-154-13	11	9-18-23
SS-A-004-091723	09-154-14	4	9-18-23
EB-A-001-091723	09-154-15	11	9-18-23
EB-A-002-091723	09-154-16	9	9-18-23
EB-A-003-091723	09-154-17	8	9-18-23
EB-B-001-091723	09-154-18	19	9-18-23
EB-C-001-091723	09-154-19	18	9-18-23
SS-C-001-091723	09-154-20	9	9-18-23
SS-C-002-091723	09-154-21	5	9-18-23
DUP-008-091723	09-154-22	8	9-18-23



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This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Volatile Organic Compounds, Semi Volatile Organic Compound, Diesel Organic Range, Polychlorinated Biphenyls (PCBs), Organochlorinated pesticides and Metal Analysis

SDG # 2308-218

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51759R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2308-218 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Comple ID	ample ID Lab ID Matrix Collec Dat		Sample	Parent		ļ	Analysis	S	
Sample ID		Date	te Sample	VOC	SVOC	РСВ	DRO	Metals	
SAND-COMP-1	08-218-01	Soil	08/18/2023		Х	Х	Х	Х	Х
SAND-COMP-2	08-218-02	Soil	08/18/2023		Х	Х	Х	Х	X
TOP-COMP-1	08-218-03	Soil	08/18/2023		Х	Х	Х	Х	Х
TOP-COMP-2	08-218-04	Soil	08/18/2023		Х	Х	Х	Х	Х
TB-08182023	08-218-05	Water	08/18/2023		Х				

Notes:

VOC Volatile Organic Compounds

SVOC Semi-volatile Organic Compounds

PCB Polychlorinated Biphenyls

DRO Diesel Organic Range

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed		Reported		Performance Acceptable		Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		Х	
12.	Data Package Completeness and Compliance		Х		х	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260D, 8270E, 8270E-SIM, 8082A, and NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Water SW-846 8260D		14 days from collection to analysis (preserved)7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil	14 days from extraction to analysis	Cool to <6 °C.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

The LCS/LCSD analysis exhibited recoveries and RPDs within the control limits.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for the samples from this SDG.

7. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra. No compounds were detected in the samples within this SDG.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260B		Reported		rmance ptable	Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROMETR	Y (GC/M	S)			
Tier II Validation					
Holding times		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method blanks		Х		Х	
B. Equipment blanks	Х				Х
C. Trip blanks		Х		Х	
Laboratory Control Sample (LCS)		Х		Х	
Laboratory Control Sample Duplicate (LCSD)		Х		Х	
LCS/LCSD Precision (RPD)		Х		Х	
Matrix Spike (MS)	Х				Х
Matrix Spike Duplicate (MSD)	Х				Х
MS/MSD Precision (RPD)	Х				Х
Field/Lab Duplicate (RPD)	Х				Х
Surrogate Spike Recoveries		Х		Х	
Dilution Factor		Х		Х	
Moisture Content		Х		Х	
Notes:		1		1	1

%R Percent recovery

RPD Relative percent difference

%D Percent difference

SEMI VOLATILE ORGANIC COMPOUND (SVOCs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270E /8270E SIM	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits and and that all SVOC surrogate recoveries be greater than ten percent.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample SAND-COMP-1. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

7. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SEMIVOLATILE ORGANIC COMPOUNDS

SVOCs: SW-846 8270E/ 8270 ESIM		Reported		mance otable	Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROM	ETRY (GC	:/MS)			
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		Х		Х	
Blanks					1
D. Method blanks		Х		X	
E. Equipment blanks	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R		Х		Х	
Matrix Spike Duplicate (MSD) %R		Х		Х	
MS/MSD Precision (RPD)		Х		Х	
Field/Lab Duplicate (RPD)	Х				Х
Surrogate Spike Recoveries		Х		Х	
Dilution Factor		Х		X	
Moisture Content		Х		X	
Nataa	1				1

Notes:

%R Percent recovery

RPD Relative percent difference

%D Percent difference

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Soil	1 year from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target compounds were not detected at concentrations greater than the PQL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report but were within the acceptable recovery limits as indicated by the laboratory.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

Pesticides: SW-846 80824		Reported		mance otable	Not	
	No	Yes	No	Yes	Required	
Gas Chromatography/Electron Capture Detector (GC/	ECD)					
Tier II Validation						
Holding times		Х		X		
Reporting limits (units)		Х		x		
Blanks						
A. Method blanks		X		X		
B. Equipment and/or Field blanks	Х				Х	
Laboratory Control Sample (LCS) %R	Х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD Precision (RPD)	Х				Х	
Matrix Spike (MS) %R	Х				Х	
Matrix Spike Duplicate (MSD) %R	Х				Х	
MS/MSD RPD	Х				Х	
Field Duplicate Sample RPD	Х				Х	
Surrogate Spike Recoveries		Х		Х		
Column %D \leq 40% (If dual column is performed for reporting - not confirmation)	х				Х	
Dilution Factor	Х				Х	
Moisture Content	Х				Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
NWTPH-Dx	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target compounds were not detected at concentrations greater than the PQL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was not performed on samples from this SDG.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report but were within the acceptable recovery limits as indicated by the laboratory.

7. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

8. System Performance and Overall Assessment

The laboratory qualified a few Diesel Range Organics results with a "N" qualifier to indicate Hydrocarbons in the lube oil range are impacting the diesel range result. The "N" qualifier was removed and "J" qualifier added to indicate the result is estimated.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DIESEL RANGE ORGANICS ANALYSES

DIESEL RANGE ORGANICS ANALYSE:		Reported		mance ptable	Not	
NWTPH-Dx	No	Yes	No	Yes	Required	
Gas Chromatography/Flame Ionization Detector (GC/FID)	•				
Tier II Validation						
Holding Times		X		Х		
Reporting limits (units)		Х		Х		
Blanks						
A. Method blanks		Х		Х		
B. Equipment/Field blanks	Х				Х	
C. Trip blanks	Х				Х	
Surrogates Accuracy (%R)		Х		Х		
Matrix Spike (MS) %R	Х				Х	
Matrix Spike Duplicate (MSD) %R	Х				Х	
MS/MSD Precision (RPD)	Х				Х	
Laboratory Control Sample (LCS) %R	Х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD RPD	Х				Х	
Laboratory Duplicate Sample RPD					Х	
Field Duplicate Sample RPD	Х				Х	
Dilution Factor	Х				Х	

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

ORGANOCHLORINATED PESTICIDES ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8081B	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target compounds were not detected at concentrations greater than the PQL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis performed on sample SAND-COMP-1. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was not performed on samples from this SDG.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report but were within the acceptable recovery limits as indicated by the laboratory.

7. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

8. System Performance and Overall Assessment

The case narrative noted that the continuing calibration verification (CCV) for the compound Endosulfan sulfate was outside the control limit. The associated field samples TOP-COMP-1 and TOP-COMP-2 results are qualified as estimated (J/UJ).

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR ORGANOCHLORINATED PESTICIDES

ORGANOCHI ORINATED PESTICIDES: 8081B		Reported		ptable	Not	
	No	Yes	No	Yes	Required	
Gas Chromatography/Flame Ionization Detector (GC/FID)						
Tier II Validation						
Holding Times		Х		Х		
Reporting limits (units)		Х		Х		
Blanks						
A. Method blanks		Х		Х		
B. Equipment/Field blanks	Х				Х	
C. Trip blanks	Х				Х	
Surrogates Accuracy (%R)		Х		Х		
Matrix Spike (MS) %R		Х		Х		
Matrix Spike Duplicate (MSD) %R		Х		Х		
MS/MSD Precision (RPD)		Х		Х		
Laboratory Control Sample (LCS) %R	Х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD RPD	Х				Х	
Laboratory Duplicate Sample RPD	Х				Х	
Field Duplicate Sample RPD	Х				Х	
Dilution Factor	Х				Х	

Notes:%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and 7471B. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
SW-846 7471B	Soil	28 days from collection to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed for lead on sample SAND-COMP-1 for Mercury. The MS/MSD analysis exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis performed on the sample SAND-COMP-1. The laboratory duplicate analysis exhibited RPD within the control limits.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS results were not provided in the lab report but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

A field duplicate sample was not collected within this SDG.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D and 7471B		Reported		rmance ptable	Not	
	No	Yes	No	Yes	Required	
Inductively Coupled Plasma - Atomic Emission Spect Atomic Absorption – Cold Vapor (CV)	rometry (I	CP-AES)				
Tier II Validation						
Holding Times		Х		Х		
Reporting limits (units)		Х		Х		
Blanks						
A. Method Blanks		X		Х		
B. Equipment/Field Blanks	Х				Х	
Laboratory Control Sample (LCS) %R	х				Х	
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х	
LCS/LCSD Precision (RPD)	Х				Х	
Matrix Spike (MS) %R		Х		Х		
Matrix Spike Duplicate (MSD) %R		Х		Х		
MS/MSD Precision (RPD)		Х		Х		
Laboratory Duplicate Sample (RPD)		Х		Х		
Field Duplicate Sample (RPD)	Х				Х	
ICP Serial Dilution %D	Х				Х	
Reporting Limit Verification		Х		Х		

Notes: %R Percent recovery RPD Relative percent difference %D Percent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M $\cdot \cdot$

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



OnSite	Chain	of Custody	Page of
Analytical Laboratory Testing Services 14648 NE 95th Street • Redmond, WA 98052	Turnaround Request (in working days)	Laboratory Number: <u>08-21</u>	8
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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

0 0 0 1 7				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
Diesel Range Organics	ND	26	NWTPH-Dx	8-21-23	8-23-23	
Lube Oil Range Organics	ND	52	NWTPH-Dx	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	85	50-150				
Client ID:	SAND-COMP-2					
Laboratory ID:	08-218-02					
Diesel Range Organics	ND	26	NWTPH-Dx	8-21-23	8-23-23	
Lube Oil Range Organics	ND	52	NWTPH-Dx	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	76	50-150				
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
Diesel Range Organics	42	27	NWTPH-Dx	8-21-23	8-23-23	-N- J
Lube Oil Range Organics	600	54	NWTPH-Dx	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	79	50-150				
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
Diesel Range Organics	32	27	NWTPH-Dx	8-21-23	8-23-23	L J
Lube Oil Range Organics	490	 54	NWTPH-Dx	8-21-23	8-23-23	
Surrogate:	Percent Recoverv	Control Limits	X			
o-Terphenyl	76	50-150				
Client ID: Laboratory ID: Diesel Range Organics Lube Oil Range Organics Surrogate: o-Terphenyl	TOP-COMP-2 08-218-04 32 490 Percent Recovery 76	27 54 Control Limits 50-150	NWTPH-Dx NWTPH-Dx	8-21-23 8-21-23	8-23-23 8-23-23	H_ J



This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

VOLATILE ORGANICS EPA 8260D page 1 of 2

Matrix: Soil Units: mg/kg

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
Dichlorodifluoromethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Chloromethane	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Vinyl Chloride	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Bromomethane	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Chloroethane	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Trichlorofluoromethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloroethene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Acetone	ND	0.0063	EPA 8260D	8-18-23	8-18-23	
lodomethane	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Carbon Disulfide	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Methylene Chloride	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
(trans) 1,2-Dichloroethene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Methyl t-Butyl Ether	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloroethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Vinyl Acetate	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
2,2-Dichloropropane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
(cis) 1,2-Dichloroethene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
2-Butanone	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Bromochloromethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Chloroform	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1,1-Trichloroethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Carbon Tetrachloride	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloropropene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Benzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2-Dichloroethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Trichloroethene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2-Dichloropropane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Dibromomethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Bromodichloromethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
2-Chloroethyl Vinyl Ether	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
(cis) 1,3-Dichloropropene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Methyl Isobutyl Ketone	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Toluene	ND	0.0032	EPA 8260D	8-18-23	8-18-23	



VOLATILE ORGANICS EPA 8260D page 2 of 2

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
(trans) 1,3-Dichloropropene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1,2-Trichloroethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Tetrachloroethene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,3-Dichloropropane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
2-Hexanone	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Dibromochloromethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromoethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Chlorobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1,1,2-Tetrachloroethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Ethylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
m,p-Xylene	ND	0.0013	EPA 8260D	8-18-23	8-18-23	
o-Xylene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Styrene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Bromoform	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
lsopropylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Bromobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,1,2,2-Tetrachloroethane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2,3-Trichloropropane	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
n-Propylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
2-Chlorotoluene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
4-Chlorotoluene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,3,5-Trimethylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
tert-Butylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2,4-Trimethylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
sec-Butylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,3-Dichlorobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
p-Isopropyltoluene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,4-Dichlorobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2-Dichlorobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
n-Butylbenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromo-3-chloropropane	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
1,2,4-Trichlorobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Hexachlorobutadiene	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
Naphthalene	ND	0.0032	EPA 8260D	8-18-23	8-18-23	
1,2,3-Trichlorobenzene	ND	0.00063	EPA 8260D	8-18-23	8-18-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	93	75-130				
Toluene-d8	108	78-128				
4-Bromofluorobenzene	94	71-130				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

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VOLATILE ORGANICS EPA 8260D page 1 of 2

Matrix: Soil Units: mg/kg

				Date	Date		
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags	
Client ID:	SAND-COMP-2						
Laboratory ID:	08-218-02						
Dichlorodifluoromethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Chloromethane	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
Vinyl Chloride	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Bromomethane	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
Chloroethane	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
Trichlorofluoromethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
1,1-Dichloroethene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Acetone	ND	0.0098	EPA 8260D	8-18-23	8-18-23		
lodomethane	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
Carbon Disulfide	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Methylene Chloride	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
(trans) 1,2-Dichloroethene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Methyl t-Butyl Ether	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
1,1-Dichloroethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Vinyl Acetate	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
2,2-Dichloropropane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
(cis) 1,2-Dichloroethene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
2-Butanone	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
Bromochloromethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Chloroform	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
1,1,1-Trichloroethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Carbon Tetrachloride	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
1,1-Dichloropropene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Benzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
1,2-Dichloroethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Trichloroethene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
1,2-Dichloropropane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Dibromomethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Bromodichloromethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
2-Chloroethyl Vinyl Ether	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
(cis) 1,3-Dichloropropene	ND	0.00098	EPA 8260D	8-18-23	8-18-23		
Methyl Isobutyl Ketone	ND	0.0049	EPA 8260D	8-18-23	8-18-23		
Toluene	ND	0.0049	EPA 8260D	8-18-23	8-18-23		



VOLATILE ORGANICS EPA 8260D page 2 of 2

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-2					
Laboratory ID:	08-218-02					
(trans) 1,3-Dichloropropene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,1,2-Trichloroethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Tetrachloroethene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,3-Dichloropropane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
2-Hexanone	ND	0.0049	EPA 8260D	8-18-23	8-18-23	
Dibromochloromethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromoethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Chlorobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,1,1,2-Tetrachloroethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Ethylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
m,p-Xylene	ND	0.0020	EPA 8260D	8-18-23	8-18-23	
o-Xylene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Styrene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Bromoform	ND	0.0049	EPA 8260D	8-18-23	8-18-23	
lsopropylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Bromobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,1,2,2-Tetrachloroethane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,2,3-Trichloropropane	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
n-Propylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
2-Chlorotoluene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
4-Chlorotoluene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,3,5-Trimethylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
tert-Butylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,2,4-Trimethylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
sec-Butylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,3-Dichlorobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
p-Isopropyltoluene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,4-Dichlorobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,2-Dichlorobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
n-Butylbenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromo-3-chloropropane	ND	0.0049	EPA 8260D	8-18-23	8-18-23	
1,2,4-Trichlorobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Hexachlorobutadiene	ND	0.0049	EPA 8260D	8-18-23	8-18-23	
Naphthalene	ND	0.0049	EPA 8260D	8-18-23	8-18-23	
1,2,3-Trichlorobenzene	ND	0.00098	EPA 8260D	8-18-23	8-18-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	97	75-130				
Toluene-d8	108	78-128				
4-Bromofluorobenzene	93	71-130				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

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VOLATILE ORGANICS EPA 8260D page 1 of 2

Matrix: Soil Units: mg/kg

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
Dichlorodifluoromethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Chloromethane	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Vinyl Chloride	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Bromomethane	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Chloroethane	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Trichlorofluoromethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloroethene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Acetone	ND	0.022	EPA 8260D	8-18-23	8-18-23	
lodomethane	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Carbon Disulfide	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Methylene Chloride	ND	0.011	EPA 8260D	8-18-23	8-18-23	
(trans) 1,2-Dichloroethene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Methyl t-Butyl Ether	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloroethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Vinyl Acetate	ND	0.011	EPA 8260D	8-18-23	8-18-23	
2,2-Dichloropropane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
(cis) 1,2-Dichloroethene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
2-Butanone	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Bromochloromethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Chloroform	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,1,1-Trichloroethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Carbon Tetrachloride	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloropropene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Benzene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,2-Dichloroethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Trichloroethene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,2-Dichloropropane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Dibromomethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Bromodichloromethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
2-Chloroethyl Vinyl Ether	ND	0.011	EPA 8260D	8-18-23	8-18-23	
(cis) 1,3-Dichloropropene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Methyl Isobutyl Ketone	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Toluene	ND	0.011	EPA 8260D	8-18-23	8-18-23	



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VOLATILE ORGANICS EPA 8260D
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				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
(trans) 1,3-Dichloropropene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,1,2-Trichloroethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Tetrachloroethene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,3-Dichloropropane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
2-Hexanone	ND	0.011	EPA 8260D	8-18-23	8-18-23	
Dibromochloromethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromoethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Chlorobenzene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
1,1,1,2-Tetrachloroethane	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Ethylbenzene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
m,p-Xylene	ND	0.0043	EPA 8260D	8-18-23	8-18-23	
o-Xylene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Styrene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Bromoform	ND	0.011	EPA 8260D	8-18-23	8-18-23	
lsopropylbenzene	ND	0.0022	EPA 8260D	8-18-23	8-18-23	
Bromobenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,1,2,2-Tetrachloroethane	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,2,3-Trichloropropane	ND	0.058	EPA 8260D	8-23-23	8-23-23	
n-Propylbenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
2-Chlorotoluene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
4-Chlorotoluene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,3,5-Trimethylbenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
tert-Butylbenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,2,4-Trimethylbenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
sec-Butylbenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,3-Dichlorobenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
p-Isopropyltoluene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,4-Dichlorobenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,2-Dichlorobenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
n-Butylbenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
1,2-Dibromo-3-chloropropane	ND	0.29	EPA 8260D	8-23-23	8-23-23	
1,2,4-Trichlorobenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
Hexachlorobutadiene	ND	0.29	EPA 8260D	8-23-23	8-23-23	
Naphthalene	ND	0.29	EPA 8260D	8-23-23	8-23-23	
1,2,3-Trichlorobenzene	ND	0.058	EPA 8260D	8-23-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	98	75-130				
Toluene-d8	106	78-128				
4-Bromofluorobenzene	80	71-130				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

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Matrix: Soil Units: mg/kg

Analyte	Result	PQL	Method	Date	Date	
				Prepared	Analyzed	Flags
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
Dichlorodifluoromethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Chloromethane	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Vinyl Chloride	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Bromomethane	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Chloroethane	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Trichlorofluoromethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloroethene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Acetone	ND	0.019	EPA 8260D	8-18-23	8-18-23	
lodomethane	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Carbon Disulfide	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Methylene Chloride	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
(trans) 1,2-Dichloroethene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Methyl t-Butyl Ether	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloroethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Vinyl Acetate	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
2,2-Dichloropropane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
(cis) 1,2-Dichloroethene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
2-Butanone	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Bromochloromethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Chloroform	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1,1-Trichloroethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Carbon Tetrachloride	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1-Dichloropropene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Benzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2-Dichloroethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Trichloroethene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2-Dichloropropane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Dibromomethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Bromodichloromethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
2-Chloroethyl Vinyl Ether	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
(cis) 1,3-Dichloropropene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Methyl Isobutyl Ketone	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Toluene	ND	0.0097	EPA 8260D	8-18-23	8-18-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

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VOLATILE ORGANICS EPA 82	60D
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				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
(trans) 1,3-Dichloropropene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1,2-Trichloroethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Tetrachloroethene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,3-Dichloropropane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
2-Hexanone	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Dibromochloromethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromoethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Chlorobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1,1,2-Tetrachloroethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Ethylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
m,p-Xylene	ND	0.0039	EPA 8260D	8-18-23	8-18-23	
o-Xylene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Styrene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Bromoform	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Isopropylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Bromobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,1,2,2-Tetrachloroethane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2,3-Trichloropropane	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
n-Propylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
2-Chlorotoluene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
4-Chlorotoluene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,3,5-Trimethylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
tert-Butylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2,4-Trimethylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
sec-Butylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,3-Dichlorobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
p-Isopropyltoluene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,4-Dichlorobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2-Dichlorobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
n-Butylbenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
1,2-Dibromo-3-chloropropane	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
1,2,4-Trichlorobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Hexachlorobutadiene	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
Naphthalene	ND	0.0097	EPA 8260D	8-18-23	8-18-23	
1,2,3-Trichlorobenzene	ND	0.0019	EPA 8260D	8-18-23	8-18-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	99	75-130				
Toluene-d8	105	78-128				
4-Bromofluorobenzene	81	71-130				



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

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Matrix: Water Units: ug/L

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TB-08182023					
Laboratory ID:	08-218-05					
Dichlorodifluoromethane	ND	0.29	EPA 8260D	8-21-23	8-21-23	
Chloromethane	ND	1.0	EPA 8260D	8-21-23	8-21-23	
Vinyl Chloride	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Bromomethane	ND	1.0	EPA 8260D	8-21-23	8-21-23	
Chloroethane	ND	1.0	EPA 8260D	8-21-23	8-21-23	
Trichlorofluoromethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,1-Dichloroethene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Acetone	ND	5.0	EPA 8260D	8-21-23	8-21-23	
lodomethane	ND	7.7	EPA 8260D	8-21-23	8-21-23	
Carbon Disulfide	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Methylene Chloride	ND	1.0	EPA 8260D	8-21-23	8-21-23	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Methyl t-Butyl Ether	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,1-Dichloroethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Vinyl Acetate	ND	1.0	EPA 8260D	8-21-23	8-21-23	
2,2-Dichloropropane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
2-Butanone	ND	5.0	EPA 8260D	8-21-23	8-21-23	
Bromochloromethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Chloroform	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,1,1-Trichloroethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Carbon Tetrachloride	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,1-Dichloropropene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Benzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2-Dichloroethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Trichloroethene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2-Dichloropropane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Dibromomethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Bromodichloromethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
(cis) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Methyl Isobutyl Ketone	ND	2.0	EPA 8260D	8-21-23	8-21-23	
Toluene	ND	1.0	EPA 8260D	8-21-23	8-21-23	
(trans) 1,3-Dichloropropene	ND	0.20	EPA 8260D	8-21-23	8-21-23	



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				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TB-08182023					
Laboratory ID:	08-218-05					
1,1,2-Trichloroethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Tetrachloroethene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,3-Dichloropropane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
2-Hexanone	ND	2.0	EPA 8260D	8-21-23	8-21-23	
Dibromochloromethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2-Dibromoethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Chlorobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,1,1,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Ethylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
m,p-Xylene	ND	0.40	EPA 8260D	8-21-23	8-21-23	
o-Xylene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Styrene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Bromoform	ND	1.0	EPA 8260D	8-21-23	8-21-23	
Isopropylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Bromobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,1,2,2-Tetrachloroethane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2,3-Trichloropropane	ND	0.20	EPA 8260D	8-21-23	8-21-23	
n-Propylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
2-Chlorotoluene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
4-Chlorotoluene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,3,5-Trimethylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
tert-Butylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2,4-Trimethylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
sec-Butylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,3-Dichlorobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
p-Isopropyltoluene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,4-Dichlorobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2-Dichlorobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
n-Butylbenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
1,2-Dibromo-3-chloropropane	ND	1.0	EPA 8260D	8-21-23	8-21-23	
1,2,4-Trichlorobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Hexachlorobutadiene	ND	1.0	EPA 8260D	8-21-23	8-21-23	
Naphthalene	ND	1.0	EPA 8260D	8-21-23	8-21-23	
1,2,3-Trichlorobenzene	ND	0.20	EPA 8260D	8-21-23	8-21-23	
Surrogate:	Percent Recovery	Control Limits				
Dibromofluoromethane	91	75-127				
Toluene-d8	96	80-127				
4-Bromofluorobenzene	100	78-125				



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Matrix: Soil Units: mg/Kg

0 0				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
n-Nitrosodimethylamine	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Pyridine	ND	0.35	EPA 8270E	8-24-23	8-24-23	
Phenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Aniline	ND	0.17	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethyl)ether	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2-Chlorophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
1,3-Dichlorobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
1,4-Dichlorobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Benzyl alcohol	ND	0.070	EPA 8270E	8-24-23	8-24-23	
1,2-Dichlorobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2-Methylphenol (o-Cresol)	ND	0.035	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroisopropyl)ether	ND	0.035	EPA 8270E	8-24-23	8-24-23	
(3+4)-Methylphenol (m,p-Cresol)	ND	0.035	EPA 8270E	8-24-23	8-24-23	
n-Nitroso-di-n-propylamine	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Hexachloroethane	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Nitrobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Isophorone	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2-Nitrophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,4-Dimethylphenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethoxy)methane	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,4-Dichlorophenol	ND	0.070	EPA 8270E	8-24-23	8-24-23	
1,2,4-Trichlorobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Naphthalene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
4-Chloroaniline	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Hexachlorobutadiene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
4-Chloro-3-methylphenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2-Methylnaphthalene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
1-Methylnaphthalene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Hexachlorocyclopentadiene	ND	0.17	EPA 8270E	8-24-23	8-24-23	
2,4,6-Trichlorophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,3-Dichloroaniline	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,4,5-Trichlorophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2-Chloronaphthalene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2-Nitroaniline	ND	0.035	EPA 8270E	8-24-23	8-24-23	
1,4-Dinitrobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Dimethylphthalate	ND	0.035	EPA 8270E	8-24-23	8-24-23	
1,3-Dinitrobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,6-Dinitrotoluene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
1,2-Dinitrobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Acenaphthylene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
3-Nitroaniline	ND	0.035	EPA 8270E	8-24-23	8-24-23	



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SEMIVOLATILE ORGANICS EPA 8270E/SIM

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				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
2,4-Dinitrophenol	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Acenaphthene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
4-Nitrophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,4-Dinitrotoluene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Dibenzofuran	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,3,5,6-Tetrachlorophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
2,3,4,6-Tetrachlorophenol	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Diethylphthalate	ND	0.035	EPA 8270E	8-24-23	8-24-23	
4-Chlorophenyl-phenylether	ND	0.035	EPA 8270E	8-24-23	8-24-23	
4-Nitroaniline	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Fluorene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
4,6-Dinitro-2-methylphenol	ND	0.17	EPA 8270E	8-24-23	8-24-23	
n-Nitrosodiphenylamine	ND	0.035	EPA 8270E	8-24-23	8-24-23	
1,2-Diphenylhydrazine	ND	0.035	EPA 8270E	8-24-23	8-24-23	
4-Bromophenyl-phenylether	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Hexachlorobenzene	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Pentachlorophenol	ND	0.070	EPA 8270E	8-24-23	8-24-23	
Phenanthrene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Anthracene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Carbazole	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Di-n-butvlphthalate	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Fluoranthene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Pvrene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Butvlbenzvlphthalate	ND	0.070	EPA 8270E	8-24-23	8-24-23	
bis-2-Ethylhexyladipate	ND	0.17	EPA 8270E	8-24-23	8-24-23	
3.3'-Dichlorobenzidine	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Benzolalanthracene	ND	0.0070	FPA 8270F/SIM	8-24-23	8-24-23	
Chrysene	ND	0.0070	FPA 8270F/SIM	8-24-23	8-24-23	
bis(2-Ethylhexyl)phthalate	ND	0.17	EPA 8270F	8-24-23	8-24-23	
Di-n-octylphthalate	ND	0.035	EPA 8270E	8-24-23	8-24-23	
Benzo[b]fluoranthene	ND	0.0070	EPA 8270F/SIM	8-24-23	8-24-23	
Benzo(i k)fluoranthene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Benzolalpyrene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Indeno[1 2 3-cd]pyrene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Dibenz[a h]anthracene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Benzola h ilpervlene	ND	0.0070	EPA 8270E/SIM	8-24-23	8-24-23	
Surrogate:	Percent Recovery	Control Limits	2,7,02,02,01,010	021-20	0 2 1 20	
2-Eluorophenol	80	11 - 111				
Phenol-d6	84	26 - 117				
Nitrobenzene-d5	82	31 - 111				
2-Eluorobiphenvl	88	38 - 109				
2 4 6-Tribromophenol	83	27 - 127				
Terphenvl-d14	93	37 - 116				
		0				



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Matrix: Soil Units: mg/Kg

0 0				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-2					
Laboratory ID:	08-218-02					
n-Nitrosodimethylamine	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Pyridine	ND	0.34	EPA 8270E	8-24-23	8-24-23	
Phenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Aniline	ND	0.17	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethyl)ether	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2-Chlorophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
1,3-Dichlorobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
1,4-Dichlorobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Benzyl alcohol	ND	0.069	EPA 8270E	8-24-23	8-24-23	
1,2-Dichlorobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2-Methylphenol (o-Cresol)	ND	0.034	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroisopropyl)ether	ND	0.034	EPA 8270E	8-24-23	8-24-23	
(3+4)-Methylphenol (m,p-Cresol)	ND	0.034	EPA 8270E	8-24-23	8-24-23	
n-Nitroso-di-n-propylamine	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Hexachloroethane	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Nitrobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Isophorone	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2-Nitrophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,4-Dimethylphenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethoxy)methane	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,4-Dichlorophenol	ND	0.069	EPA 8270E	8-24-23	8-24-23	
1,2,4-Trichlorobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Naphthalene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
4-Chloroaniline	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Hexachlorobutadiene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
4-Chloro-3-methylphenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2-Methylnaphthalene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
1-Methylnaphthalene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Hexachlorocyclopentadiene	ND	0.17	EPA 8270E	8-24-23	8-24-23	
2,4,6-Trichlorophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,3-Dichloroaniline	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,4,5-Trichlorophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2-Chloronaphthalene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2-Nitroaniline	ND	0.034	EPA 8270E	8-24-23	8-24-23	
1,4-Dinitrobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Dimethylphthalate	ND	0.034	EPA 8270E	8-24-23	8-24-23	
1,3-Dinitrobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,6-Dinitrotoluene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
1,2-Dinitrobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Acenaphthylene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
3-Nitroaniline	ND	0.034	EPA 8270E	8-24-23	8-24-23	



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				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-2					
Laboratory ID:	08-218-02					
2,4-Dinitrophenol	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Acenaphthene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
4-Nitrophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,4-Dinitrotoluene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Dibenzofuran	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,3,5,6-Tetrachlorophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
2,3,4,6-Tetrachlorophenol	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Diethylphthalate	ND	0.034	EPA 8270E	8-24-23	8-24-23	
4-Chlorophenyl-phenylether	ND	0.034	EPA 8270E	8-24-23	8-24-23	
4-Nitroaniline	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Fluorene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
4,6-Dinitro-2-methylphenol	ND	0.17	EPA 8270E	8-24-23	8-24-23	
n-Nitrosodiphenylamine	ND	0.034	EPA 8270E	8-24-23	8-24-23	
1,2-Diphenylhydrazine	ND	0.034	EPA 8270E	8-24-23	8-24-23	
4-Bromophenyl-phenylether	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Hexachlorobenzene	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Pentachlorophenol	ND	0.069	EPA 8270E	8-24-23	8-24-23	
Phenanthrene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Anthracene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Carbazole	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Di-n-butylphthalate	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Fluoranthene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Pyrene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Butylbenzylphthalate	ND	0.068	EPA 8270E	8-24-23	8-24-23	
bis-2-Ethylhexyladipate	ND	0.17	EPA 8270E	8-24-23	8-24-23	
3,3'-Dichlorobenzidine	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Benzo[a]anthracene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Chrysene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
bis(2-Ethylhexyl)phthalate	ND	0.17	EPA 8270E	8-24-23	8-24-23	
Di-n-octylphthalate	ND	0.034	EPA 8270E	8-24-23	8-24-23	
Benzo[b]fluoranthene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Benzo(i.k)fluoranthene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Benzolalpyrene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Indeno[1.2.3-cd]pyrene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Dibenz[a,h]anthracene	ND	0.0069	EPA 8270E/SIM	8-24-23	8-24-23	
Benzola h ilpervlene	ND	0.0069	EPA 8270F/SIM	8-24-23	8-24-23	
Surrogate:	Percent Recoverv	Control Limits		3 = . = 0	0 = . = 0	
2-Fluorophenol	52	11 - 111				
Phenol-d6	52	26 - 117				
Nitrobenzene-d5	50	31 - 111				
2-Fluorobiphenvl	61	38 - 109				
2.4.6-Tribromophenol	63	27 - 127				
Terphenyl-d14	65	37 - 116				

SEMIVOLATILE ORGANICS EPA 8270E/SIM page 1 of 2

Matrix: Soil Units: mg/Kg

0 0				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
n-Nitrosodimethylamine	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Pyridine	ND	0.36	EPA 8270E	8-24-23	8-24-23	
Phenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Aniline	ND	0.18	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethyl)ether	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Chlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,3-Dichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,4-Dichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Benzyl alcohol	ND	0.072	EPA 8270E	8-24-23	8-24-23	
1,2-Dichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Methylphenol (o-Cresol)	ND	0.036	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroisopropyl)ether	ND	0.036	EPA 8270E	8-24-23	8-24-23	
(3+4)-Methylphenol (m,p-Cresol)	ND	0.036	EPA 8270E	8-24-23	8-24-23	
n-Nitroso-di-n-propylamine	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Hexachloroethane	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Nitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Isophorone	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Nitrophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4-Dimethylphenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethoxy)methane	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4-Dichlorophenol	ND	0.072	EPA 8270E	8-24-23	8-24-23	
1,2,4-Trichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Naphthalene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
4-Chloroaniline	ND	0.18	EPA 8270E	8-24-23	8-24-23	
Hexachlorobutadiene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
4-Chloro-3-methylphenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Methylnaphthalene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
1-Methylnaphthalene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Hexachlorocyclopentadiene	ND	0.18	EPA 8270E	8-24-23	8-24-23	
2,4,6-Trichlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,3-Dichloroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4,5-Trichlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Chloronaphthalene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Nitroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,4-Dinitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Dimethylphthalate	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,3-Dinitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,6-Dinitrotoluene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,2-Dinitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Acenaphthylene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
3-Nitroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	



SEMIVOLATILE ORGANICS EPA 8270E/SIM

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				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
2,4-Dinitrophenol	ND	0.18	EPA 8270E	8-24-23	8-24-23	
Acenaphthene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
4-Nitrophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4-Dinitrotoluene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Dibenzofuran	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,3,5,6-Tetrachlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,3,4,6-Tetrachlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Diethylphthalate	ND	0.036	EPA 8270E	8-24-23	8-24-23	
4-Chlorophenyl-phenylether	ND	0.036	EPA 8270E	8-24-23	8-24-23	
4-Nitroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Fluorene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
4,6-Dinitro-2-methylphenol	ND	0.18	EPA 8270E	8-24-23	8-24-23	
n-Nitrosodiphenylamine	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,2-Diphenylhydrazine	ND	0.036	EPA 8270E	8-24-23	8-24-23	
4-Bromophenyl-phenylether	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Hexachlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Pentachlorophenol	ND	0.072	EPA 8270E	8-24-23	8-24-23	
Phenanthrene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Anthracene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Carbazole	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Di-n-butvlphthalate	ND	0.18	EPA 8270E	8-24-23	8-24-23	
Fluoranthene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Pvrene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Butvlbenzvlphthalate	ND	0.072	EPA 8270E	8-24-23	8-24-23	
bis-2-Ethylhexyladipate	ND	0.18	EPA 8270E	8-24-23	8-24-23	
3.3'-Dichlorobenzidine	ND	0.18	EPA 8270E	8-24-23	8-24-23	
Benzolalanthracene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Chrysene	ND	0.0072	EPA 8270F/SIM	8-24-23	8-24-23	
bis(2-Ethylhexyl)phthalate	ND	0.18	FPA 8270F	8-24-23	8-24-23	
Di-n-octylphthalate	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Benzo[b]fluoranthene	ND	0.0072	EPA 8270F/SIM	8-24-23	8-24-23	
Benzo(i k)fluoranthene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Benzolalpyrene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Indeno[1 2 3-cd]pyrene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Dibenz[a h]anthracene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Benzola h ilpervlene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Surrogate:	Percent Recovery	Control Limits	2.7.02702/01/01/01	021-20	0 2 1 20	
2-Eluorophenol	60	11 - 111				
Phenol-d6	57	26 - 117				
Nitrobenzene-d5	69	31 - 111				
2-Eluorobiphenvl	75	38 - 109				
2 4 6-Tribromophenol	71	27 - 127				
Terphenvl-d14	71	37 - 116				
		0				

SEMIVOLATILE ORGANICS EPA 8270E/SIM page 1 of 2

Matrix: Soil Units: mg/Kg

0 0				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
n-Nitrosodimethylamine	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Pyridine	ND	0.36	EPA 8270E	8-24-23	8-24-23	
Phenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Aniline	ND	0.18	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethyl)ether	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Chlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,3-Dichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,4-Dichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Benzyl alcohol	ND	0.072	EPA 8270E	8-24-23	8-24-23	
1,2-Dichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Methylphenol (o-Cresol)	ND	0.036	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroisopropyl)ether	ND	0.036	EPA 8270E	8-24-23	8-24-23	
(3+4)-Methylphenol (m,p-Cresol)	ND	0.036	EPA 8270E	8-24-23	8-24-23	
n-Nitroso-di-n-propylamine	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Hexachloroethane	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Nitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Isophorone	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Nitrophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4-Dimethylphenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
bis(2-Chloroethoxy)methane	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4-Dichlorophenol	ND	0.072	EPA 8270E	8-24-23	8-24-23	
1,2,4-Trichlorobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Naphthalene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
4-Chloroaniline	ND	0.18	EPA 8270E	8-24-23	8-24-23	
Hexachlorobutadiene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
4-Chloro-3-methylphenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Methylnaphthalene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
1-Methylnaphthalene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
Hexachlorocyclopentadiene	ND	0.18	EPA 8270E	8-24-23	8-24-23	
2,4,6-Trichlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,3-Dichloroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,4,5-Trichlorophenol	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Chloronaphthalene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2-Nitroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,4-Dinitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Dimethylphthalate	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,3-Dinitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
2,6-Dinitrotoluene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
1,2-Dinitrobenzene	ND	0.036	EPA 8270E	8-24-23	8-24-23	
Acenaphthylene	ND	0.0072	EPA 8270E/SIM	8-24-23	8-24-23	
3-Nitroaniline	ND	0.036	EPA 8270E	8-24-23	8-24-23	



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PCBs EPA 8082A

Matrix: Soil Units: mg/Kg (ppm)

0 0 0 1 /				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
Aroclor 1016	ND	0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1221	ND	0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1232	ND	0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1242	ND	0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1248	ND	0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1254 ND		0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1260	ND	0.052	EPA 8082A	8-21-23	8-23-23	
ND ND		0.052	EPA 8082A	8-21-23	8-23-23	
Aroclor 1268	ND	0.052	EPA 8082A	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	85	50-127				
Client ID:	SAND-COMP-2					
Laboratory ID:	08-218-02					
Aroclor 1016	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1221	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1232	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1242	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1248	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1254	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1260	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1262	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Aroclor 1268	ND	0.051	EPA 8082A	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	85	50-127				
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
Aroclor 1016	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1221	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1232	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1242	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1248	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1254	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1260	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1262	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1268	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	82	50-127				

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PCBs EPA 8082A

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
Aroclor 1016	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1221	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1232	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1242	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1248	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1254	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1260	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1262	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Aroclor 1268	ND	0.054	EPA 8082A	8-21-23	8-23-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	83	50-127				



Matrix: Soil Units: ug/Kg (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
alpha-BHC	ND	5.2	EPA 8081B	8-21-23	8-24-23	
gamma-BHC	ND	5.2	EPA 8081B	8-21-23	8-24-23	
beta-BHC	ND	5.2	EPA 8081B	8-21-23	8-24-23	
delta-BHC	ND	5.2	EPA 8081B	8-21-23	8-24-23	
Heptachlor	ND	5.2	EPA 8081B	8-21-23	8-24-23	
Aldrin	ND	5.2	EPA 8081B	8-21-23	8-24-23	
Heptachlor epoxide	ND	5.2	EPA 8081B	8-21-23	8-24-23	
gamma-Chlordane	ND	10	EPA 8081B	8-21-23	8-24-23	
alpha-Chlordane	ND	10	EPA 8081B	8-21-23	8-24-23	
4,4'-DDE	ND	10	EPA 8081B	8-21-23	8-24-23	
Endosulfan I	ND	5.2	EPA 8081B	8-21-23	8-24-23	
Dieldrin	ND	10	EPA 8081B	8-21-23	8-24-23	
Endrin	ND	10	EPA 8081B	8-21-23	8-24-23	
4,4'-DDD	ND	10	EPA 8081B	8-21-23	8-24-23	
Endosulfan II	ND	10	EPA 8081B	8-21-23	8-24-23	
4,4'-DDT	ND	10	EPA 8081B	8-21-23	8-24-23	
Endrin aldehyde	ND	10	EPA 8081B	8-21-23	8-24-23	
Methoxychlor	ND	10	EPA 8081B	8-21-23	8-24-23	
Endosulfan sulfate	ND	10	EPA 8081B	8-21-23	8-24-23	
Endrin ketone	ND	10	EPA 8081B	8-21-23	8-24-23	
Toxaphene	ND	52	EPA 8081B	8-21-23	8-24-23	
Surrogate:	Percent Recovery	Control limits				
Tetrachloro-m-xylene	62	33-108				
Decachlorobiphenyl	66	27-120				



Matrix: Soil Units: ug/Kg (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-2					
Laboratory ID:	08-218-02					
alpha-BHC	ND	5.1	EPA 8081B	8-21-23	8-24-23	
gamma-BHC	ND	5.1	EPA 8081B	8-21-23	8-24-23	
beta-BHC	ND	5.1	EPA 8081B	8-21-23	8-24-23	
delta-BHC	ND	5.1	EPA 8081B	8-21-23	8-24-23	
Heptachlor	ND	5.1	EPA 8081B	8-21-23	8-24-23	
Aldrin	ND	5.1	EPA 8081B	8-21-23	8-24-23	
Heptachlor epoxide	ND	5.1	EPA 8081B	8-21-23	8-24-23	
gamma-Chlordane	ND	10	EPA 8081B	8-21-23	8-24-23	
alpha-Chlordane	ND	10	EPA 8081B	8-21-23	8-24-23	
4,4'-DDE	ND	10	EPA 8081B	8-21-23	8-24-23	
Endosulfan I	ND	5.1	EPA 8081B	8-21-23	8-24-23	
Dieldrin	ND	10	EPA 8081B	8-21-23	8-24-23	
Endrin	ND	10	EPA 8081B	8-21-23	8-24-23	
4,4'-DDD	ND	10	EPA 8081B	8-21-23	8-24-23	
Endosulfan II	ND	10	EPA 8081B	8-21-23	8-24-23	
4,4'-DDT	ND	10	EPA 8081B	8-21-23	8-24-23	
Endrin aldehyde	ND	10	EPA 8081B	8-21-23	8-24-23	
Methoxychlor	ND	10	EPA 8081B	8-21-23	8-24-23	
Endosulfan sulfate	ND	10	EPA 8081B	8-21-23	8-24-23	
Endrin ketone	ND	10	EPA 8081B	8-21-23	8-24-23	
Toxaphene	ND	51	EPA 8081B	8-21-23	8-24-23	
Surrogate:	Percent Recovery	Control limits				
Tetrachloro-m-xylene	61	33-108				
Decachlorobiphenyl	64	27-120				



Matrix: Soil Units: ug/Kg (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
alpha-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
gamma-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
beta-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
delta-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Heptachlor	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Aldrin	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Heptachlor epoxide	ND	5.4	EPA 8081B	8-21-23	8-24-23	
gamma-Chlordane	ND	11	EPA 8081B	8-21-23	8-24-23	
alpha-Chlordane	ND	11	EPA 8081B	8-21-23	8-24-23	
4,4'-DDE	ND	11	EPA 8081B	8-21-23	8-24-23	
Endosulfan I	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Dieldrin	ND	11	EPA 8081B	8-21-23	8-24-23	
Endrin	ND	11	EPA 8081B	8-21-23	8-24-23	
4,4'-DDD	ND	11	EPA 8081B	8-21-23	8-24-23	
Endosulfan II	ND	11	EPA 8081B	8-21-23	8-24-23	
4,4'-DDT	ND	11	EPA 8081B	8-21-23	8-24-23	
Endrin aldehyde	ND	11	EPA 8081B	8-21-23	8-24-23	
Methoxychlor	ND UJ	11	EPA 8081B	8-21-23	8-24-23	Y1
Endosulfan sulfate	ND	11	EPA 8081B	8-21-23	8-24-23	•
Endrin ketone	ND	11	EPA 8081B	8-21-23	8-24-23	
Toxaphene	ND	54	EPA 8081B	8-21-23	8-24-23	
Surrogate:	Percent Recovery	Control limits				
Tetrachloro-m-xylene	58	33-108				
Decachlorobiphenyl	56	27-120				



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Matrix: Soil Units: ug/Kg (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
alpha-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
gamma-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
beta-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
delta-BHC	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Heptachlor	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Aldrin	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Heptachlor epoxide	ND	5.4	EPA 8081B	8-21-23	8-24-23	
gamma-Chlordane	ND	11	EPA 8081B	8-21-23	8-24-23	
alpha-Chlordane	ND	11	EPA 8081B	8-21-23	8-24-23	
4,4'-DDE	ND	11	EPA 8081B	8-21-23	8-24-23	
Endosulfan I	ND	5.4	EPA 8081B	8-21-23	8-24-23	
Dieldrin	ND	11	EPA 8081B	8-21-23	8-24-23	
Endrin	ND	11	EPA 8081B	8-21-23	8-24-23	
4,4'-DDD	ND	11	EPA 8081B	8-21-23	8-24-23	
Endosulfan II	ND	11	EPA 8081B	8-21-23	8-24-23	
4,4'-DDT	ND	11	EPA 8081B	8-21-23	8-24-23	
Endrin aldehyde	ND	11	EPA 8081B	8-21-23	8-24-23	
Methoxychlor	ND UJ	11	EPA 8081B	8-21-23	8-24-23	¥1
Endosulfan sulfate	ND	11	EPA 8081B	8-21-23	8-24-23	N
Endrin ketone	ND	11	EPA 8081B	8-21-23	8-24-23	
Toxaphene	ND	54	EPA 8081B	8-21-23	8-24-23	
Surrogate:	Percent Recovery	Control limits				
Tetrachloro-m-xylene	57	33-108				
Decachlorobiphenyl	50	27-120				



TOTAL METALS EPA 6010D/7471B

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SAND-COMP-1					
Laboratory ID:	08-218-01					
Arsenic	ND	10	EPA 6010D	8-22-23	8-22-23	
Barium	14	2.6	EPA 6010D	8-22-23	8-22-23	
Cadmium	ND	0.52	EPA 6010D	8-22-23	8-22-23	
Chromium	10	0.52	EPA 6010D	8-22-23	8-22-23	
Lead	ND	5.2	EPA 6010D	8-22-23	8-22-23	
Mercury	ND	0.26	EPA 7471B	8-23-23	8-23-23	
Selenium	ND	10	EPA 6010D	8-22-23	8-22-23	
Silver	ND	1.0	EPA 6010D	8-22-23	8-22-23	

Client ID:	SAND-COMP-2								
Laboratory ID:	08-218-02								
Arsenic	ND	10	EPA 6010D	8-22-23	8-22-23				
Barium	14	2.6	EPA 6010D	8-22-23	8-22-23				
Cadmium	ND	0.51	EPA 6010D	8-22-23	8-22-23				
Chromium	8.4	0.51	EPA 6010D	8-22-23	8-22-23				
Lead	ND	5.1	EPA 6010D	8-22-23	8-22-23				
Mercury	ND	0.26	EPA 7471B	8-23-23	8-23-23				
Selenium	ND	10	EPA 6010D	8-22-23	8-22-23				
Silver	ND	1.0	EPA 6010D	8-22-23	8-22-23				

Client ID:	TOP-COMP-1					
Laboratory ID:	08-218-03					
Arsenic	ND	11	EPA 6010D	8-22-23	8-22-23	
Barium	23	2.7	EPA 6010D	8-22-23	8-22-23	
Cadmium	ND	0.54	EPA 6010D	8-22-23	8-22-23	
Chromium	14	0.54	EPA 6010D	8-22-23	8-22-23	
Lead	ND	5.4	EPA 6010D	8-22-23	8-22-23	
Mercury	ND	0.27	EPA 7471B	8-23-23	8-23-23	
Selenium	ND	11	EPA 6010D	8-22-23	8-22-23	
Silver	ND	1.1	EPA 6010D	8-22-23	8-22-23	



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

TOTAL METALS EPA 6010D/7471B

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	TOP-COMP-2					
Laboratory ID:	08-218-04					
Arsenic	ND	11	EPA 6010D	8-22-23	8-22-23	
Barium	18	2.7	EPA 6010D	8-22-23	8-22-23	
Cadmium	ND	0.54	EPA 6010D	8-22-23	8-22-23	
Chromium	11	0.54	EPA 6010D	8-22-23	8-22-23	
Lead	ND	5.4	EPA 6010D	8-22-23	8-22-23	
Mercury	ND	0.27	EPA 7471B	8-23-23	8-23-23	
Selenium	ND	11	EPA 6010D	8-22-23	8-22-23	
Silver	ND	1.1	EPA 6010D	8-22-23	8-22-23	





United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Diesel Organic Range, Polychlorinated Biphenyls (PCBs) and Metal Analysis

SDG # 2309-061

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51776R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-061 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Comula ID	Lab ID	Sample A		Parent Sample	Analysis		S
Sample ID	Lab ID	Matrix	Date	Parent Sample	PCB	DRO	Metals
SS-E-001-090923	09-061-01	Soil	09/09/2023				Х
SS-E-002-090923	09-061-02	Soil	09/09/2023				Х
SS-E-003-090923	09-061-03	Soil	09/09/2023				Х
SS-E-004-090923	09-061-04	Soil	09/09/2023				Х
SS-E-005-090923	09-061-05	Soil	09/09/2023				Х
SS-E-006-090923	09-061-06	Soil	09/09/2023				Х
SS-E-007-090923	09-061-07	Soil	09/09/2023				Х
SS-E-008-090923	09-061-08	Soil	09/09/2023				Х
SS-E-009-090923	09-061-09	Soil	09/09/2023				Х
SS-E-010-090923	09-061-10	Soil	09/09/2023				Х
SS-E-011-090923	09-061-11	Soil	09/09/2023				Х
SS-E-012-090923	09-061-12	Soil	09/09/2023				Х
EB-E-001-090923	09-061-13	Soil	09/09/2023				Х
EB-E-002-090923	09-061-14	Soil	09/09/2023				Х
EB-E-003-090923	09-061-15	Soil	09/09/2023				Х
EB-E-004-090923	09-061-16	Soil	09/09/2023				Х
EB-E-005-090923	09-061-17	Soil	09/09/2023				Х
EB-E-006-090923	09-061-18	Soil	09/09/2023				Х
EB-E-007-090923	09-061-19	Soil	09/09/2023				Х
EB-E-008-090923	09-061-20	Soil	09/09/2023				Х
EB-E-009-090923	09-061-21	Soil	09/09/2023				Х
DUP-001-090923	09-061-23	Soil	09/09/2023	EB-E-003-090923			Х
DUP-002-090923	09-061-24	Soil	09/09/2023	EB-E-008-090923			Х
EB-N-001-090923	09-061-25	Soil	09/09/2023				Х
SS-N-001-090923	09-061-26	Soil	09/09/2023				Х
SS-N-002-090923	09-061-27	Soil	09/09/2023				Х
SS-N-003-090923	09-061-28	Soil	09/09/2023				Х

Comula ID	Lak ID	Matrix	Sample	Devent Comula	Analysis		5
Sample ID	Lab ID	Matrix	Date	Parent Sample	PCB	DRO	Metals
SS-N-004-090923	09-061-29	Soil	09/09/2023				Х
DUP-003-090923	09-061-30	Soil	09/09/2023	SS-N-004-090923			Х
RS-001-090923	09-061-31	Water	09/09/2023		Х	Х	Х
RS-002-091023	09-061-32	Water	09/10/2023		Х	Х	Х
WC-001-091023	09-061-33	Soil	09/10/2023				Х
SS-M-001-091023	09-061-34	Soil	09/10/2023			Х	Х
SS-M-002-091023	09-061-35	Soil	09/10/2023			Х	Х
SS-M-003-091023	09-061-36	Soil	09/10/2023			Х	Х
SS-M-004-091023	09-061-37	Soil	09/10/2023			Х	Х
SS-M-005-091023	09-061-38	Soil	09/10/2023			Х	Х
SS-M-006-091023	09-061-39	Soil	09/10/2023			Х	Х
EB-M-001-091023	09-061-40	Soil	09/10/2023			Х	Х
EB-M-002-091023	09-061-41	Soil	09/10/2023			Х	Х
EB-M-003-091023	09-061-42	Soil	09/10/2023			Х	Х
DUP-004-091023	09-061-43	Soil	09/10/2023	EB-M-003-091023		Х	Х

Notes:

PCB Polychlorinated Biphenyls

DRO Diesel Organic Range

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Itoms Poviewod		Reported		Performance Acceptable		Not
	items keviewed		Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		Х	
4.	Methods of analysis		Х		Х	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		Х	
7.	Laboratory sample received date		Х		Х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		Х	
10.	Fully executed Chain-of-Custody (COC) form		Х	Х		
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		х	
12.	Data Package Completeness and Compliance		Х		Х	

Note:

10. The sample WC-001-091023 was requested for volatile, semi volatile and Polychlorinated Biphenyls; however, the laboratory did not perform these analyses.

4

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8082A and NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Water	1 year from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target compounds were not detected at concentrations greater than the PQL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit

recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analysis exhibited recovery and RPD within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Field duplicate sample was not analyzed for PCBs.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

Pesticides: SW-846 8082A		Reported		mance otable	Not			
		Yes	No	Yes	Required			
Gas Chromatography/Electron Capture Detector (GC/ECD)								
Tier II Validation								
Holding times		Х		Х				
Reporting limits (units)		Х		X				
Blanks				-				
A. Method blanks		Х		X				
B. Rinse blanks		Х		X				
Laboratory Control Sample (LCS) %R		Х		Х				
Laboratory Control Sample Duplicate (LCSD) %R		Х		Х				
LCS/LCSD Precision (RPD)		Х		Х				
Matrix Spike (MS) %R	Х				Х			
Matrix Spike Duplicate (MSD) %R	Х				Х			
MS/MSD RPD	Х				Х			
Field Duplicate Sample RPD	Х				Х			
Surrogate Spike Recoveries					Х			
Column %D \leq 40% (If dual column is performed for reporting - not confirmation)	х				Х			
Dilution Factor	Х				Х			
Moisture Content	Х				Х			

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
NWTETEDX	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis performed on sample SS-M-001-091023. The laboratory duplicate analysis exhibited acceptable RPDs.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
EB-M-003-091023/	Diesel Range Organics	79	98	AC
DUP-004-091023	Lube Oil Range Organics	60	76	AC

Results for duplicate samples are summarized in the following table.

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

The laboratory qualified a few Lube Oil Range Organics results with a "N1" qualifier to indicate Hydrocarbons in diesel range are impacting lube oil range results. The "N1" qualifier was removed, and "J" qualifier added to indicate the result is estimated.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DIESEL RANGE ORGANICS ANALYSE

DIESEL RANGE ORGANICS ANALYSE: NWTPH-Dx		Reported		rmance ptable	Not				
		Yes	No	Yes	Required				
Gas Chromatography/Flame Ionization Detector (GC/FID)									
Tier II Validation									
Holding Times		X		Х					
Reporting limits (units)		X		Х					
Blanks									
A. Method blanks		Х		Х					
B. Rinse blanks		X		Х					
C. Trip blanks	Х				Х				
Surrogates Accuracy (%R)		X		Х					
Matrix Spike (MS) %R	Х				Х				
Matrix Spike Duplicate (MSD) %R	Х				Х				
MS/MSD Precision (RPD)	Х				Х				
Laboratory Control Sample (LCS) %R	Х				Х				
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х				
LCS/LCSD RPD					Х				
Laboratory Duplicate Sample RPD		X		Х					
Field Duplicate Sample RPD	Х				Х				
Dilution Factor	Х				Х				

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D and EPA 200.8. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C
EPA 200.8	Water	180 days from collection to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis performed on samples EB-E-006-090923, RS-001-090923 and EB-M-003-091023. The MS/MSD analysis exhibited recoveries and RPDs within the control limits with the exception noted below.

Sample ID	Analyte	MS Recovery	MSD Recovery
EB-E-006-090923	Lead	128%	96%

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (III)	Non-detect	No Action
	Detect	J
\sim the lower control limit (1.1.) but $\sim 10\%$	Non-detect	UJ
	Detect	J
- 109/	Non-detect	R
< 10%	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis performed for lead on samples EB-E-006-090923, RS-001-090923 and EB-M-003-091023. The laboratory duplicate analysis exhibited RPD within the control limits with the exception noted below.

Sample ID	Analytes	Laboratory RPD
EB-M-003-091023	Lead	32%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to the all-sample results associated with this SDG.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and laboratory sample	20%	Non-detect	UJ
concentration >5 times detection limit		Detect	J
Parent sample and/or laboratory	Water one times RL or	Non-detect	UJ
RL and difference between samples >RL	Soil two times RL	Detect	J

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample

concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
EB-E-003-090923 / DUP-001-090923	Lead	9.9	11 U	AC
EB-E-008-090923 / DUP-002-090923	Lead	100	98 U	AC
SS-N-004-090923 / DUP-003-090923	Lead	20 U	12 U	AC
EB-M-003-091023 / DUP-004-091023	Lead	44	72 U	AC

Results for duplicate samples are summarized in the following table.

Notes:

AC Acceptable

U Not detected.

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D and 200.8		Reported		mance ptable	Not			
		Yes	No	Yes	Required			
Inductively Coupled Plasma - Atomic Emission Spectrometry (ICP-AES) Inductively Coupled Plasma - Mass Spectrometry (ICP-MS)								
Tier II Validation								
Holding Times		x		Х				
Reporting limits (units)		х		Х				
Blanks								
A. Method Blanks		x		Х				
B. Rinse blanks		X		Х				
Laboratory Control Sample (LCS) %R	Х				Х			
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х			
LCS/LCSD Precision (RPD)	Х				Х			
Matrix Spike (MS) %R		х	Х					
Matrix Spike Duplicate (MSD) %R		Х		Х				
MS/MSD Precision (RPD)		х		Х				
Laboratory Duplicate Sample (RPD)		х	Х					
Field Duplicate Sample (RPD)		х		Х				
ICP Serial Dilution %D	х				Х			
Reporting Limit Verification		Х		Х				

Notes:%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M ··

DATE: November 30, 2023

PEER REVIEW: Dennis Capria

DATE: November 30, 2023
CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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6 55-E-006-090923		1205	S	1							_	_		_							X		
7 55-E-007-090923		1215	S	1																	X		
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28 55-N-003-090923		1456	5	1																		X				
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41 EB-M-002-091023	9/10/230	925	S	1														•			X	X		VO
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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-E-001-090923					
Laboratory ID:	09-061-01					
Lead	ND	5.6	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-E-002-090923					
Laboratory ID:	09-061-02					
Lead	34	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-F-003-090923					
Laboratory ID.	09-061-03					
Lead	35	5.7	FPA 6010D	9-11-23	9-12-23	
		0.1		0 11 20	0 12 20	
Client ID:	SS-E-004-090923					
Laboratory ID:	09-061-04					
Lead	ND	5.3	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-E-005-090923					
Laboratory ID:	09-061-05					
Lead	21	5.3	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-E-006-090923					
Laboratory ID:	09-061-06					
Lead	58	5.3	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-E-007-090923					
Laboratory ID:	09-061-07					
Lead	82	5.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-F-008-090923					
Laboratory ID.	00- L-000-030923					
Lead	28	51		9 <u>11</u> -23	9-12-23	
Luau	20	0.4		J-11-2J	0-12-20	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-E-009-090923					
Laboratory ID:	09-061-09					
Lead	39	5.3	EPA 6010D	9-11-23	9-12-23	
0						
Client ID:	SS-E-010-090923					
Laboratory ID:	09-061-10					
Lead	28	5.5	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-E-011-090923					
Laboratory ID:	09-061-11					
Lead	44	5.6	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS E 042 000022					
	55-E-012-090923					
Laboratory ID:	09-061-12	E 4		0 44 02	0 40 00	
Lead	12	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-E-001-090923					
Laboratory ID:	09-061-13					
Lead	ND	5.5	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-E-002-090923					
Laboratory ID:	09-061-14					
Lead	ND	5.3	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-E-003-090923					
Laboratory ID:	09-061-15					
Lead	9.9	5.2	EPA 6010D	9-11-23	9-12-23	
Oliant ID:						
	EB-E-004-090923					
Laboratory ID:	09-061-16	r 7		0.44.00	0.40.00	
read	13	5.7	EPA 6010D	9-11-23	9-12-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-E-005-090923					
Laboratory ID:	09-061-17					
Lead	6.3	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	FB-F-006-090923					
Laboratory ID.	09-061-18					
Lead	61	54	FPA 6010D	9-11-23	9-11-23	
2000		0.1		01120	0 11 20	
Client ID:	EB-E-007-090923					
Laboratory ID:	09-061-19					
Lead	21	5.6	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-E-008-090923					
Laboratory ID:	09-061-20					
Lead	100	6.0	EPA 6010D	9-11-23	9-12-23	
Client ID:	FB-F-009-090923					
Laboratory ID:	00-061-21					
Laberatory iD.	91	5.8	FPA 6010D	9-11-23	9-12-23	
Lead	51	0.0		5-11-20	5-12-25	
Client ID:	DUP-001-090923					
Laboratory ID:	09-061-23					
Lead	11	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	DUP-002-090923					
Laboratory ID:	09-061-24					
Lead	98	6.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-N-001-090923					
Laboratory ID:	09-061-25					
Lead	8.4	5.2	EPA 6010D	9-11-23	9-12-23	
	••••	v. <u> </u>	=: / : 00 : 0B	3	÷ ·= =•	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-N-001-090923					
Laboratory ID:	09-061-26					
Lead	11	5.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-N-002-090923					
Laboratory ID:	09-061-27					
Lead	9.9	5.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-N-003-090923					
Laboratory ID:	09-061-28					
Lead	14	5.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-N-004-090923					
Laboratory ID:	09-061-29					
Lead	20	5.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	DUP-003-090923					
Laboratory ID:	09-061-30					
Lead	12	5.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-M-001-091023					
Laboratory ID:	09-061-34					
Lead	36	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-M-002-091023					
Laboratory ID:	09-061-35					
Lead	58	5.5	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-M-003-091023					
Laboratory ID:	09-061-36					
Lead	53	5.5	EPA 6010D	9-11-23	9-12-23	



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-M-004-091023					
Laboratory ID:	09-061-37					
Lead	47	5.8	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-M-005-091023					
Laboratory ID:	09-061-38					
Lead	92	6.1	EPA 6010D	9-11-23	9-12-23	
Client ID:	SS-M-006-091023					
Laboratory ID:	09-061-39					
Lead	100	6.2	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-M-001-091023					
Laboratory ID:	09-061-40					
Lead	84	5.6	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-M-002-091023					
Laboratory ID:	09-061-41					
Lead	24	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	EB-M-003-091023					
Laboratory ID:	09-061-42					
Lead	44 J	5.4	EPA 6010D	9-11-23	9-12-23	
Client ID:	DUP-004-091023					
Laboratory ID:	09-061-43					
Lead	72	5.5	EPA 6010D	9-11-23	9-12-23	



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TOTAL LEAD EPA 200.8

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-001-090923					
Laboratory ID:	09-061-31					
Lead	ND	1.1	EPA 200.8	9-13-23	9-13-23	

Client ID:	RS-002-091023					
Laboratory ID:	09-061-32					
Lead	ND	1.1	EPA 200.8	9-13-23	9-13-23	



DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Water Units: mg/L (ppm)

0 (11)				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-001-090923					
Laboratory ID:	09-061-31					
Diesel Range Organics	ND	0.21	NWTPH-Dx	9-12-23	9-12-23	
Lube Oil Range Organics	ND	0.21	NWTPH-Dx	9-12-23	9-12-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	84	50-150				
Client ID:	RS-002-091023					
Laboratory ID:	09-061-32					
Diosol Bango Organics	ND	0.20		0 12 22	0 12 22	

Diesel Range Organics	ND	0.20	NWTPH-Dx	9-12-23	9-12-23	
Lube Oil Range Organics	ND	0.20	NWTPH-Dx	9-12-23	9-12-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	113	50-150				



DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-M-001-091023					
Laboratory ID:	09-061-34					
Diesel Range Organics	ND	27	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil	56	54	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	68	50-150				
Client ID:	SS-M-002-091023					
Laboratory ID:	09-061-35					
Diesel Range Organics	ND	27	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil Range Organics	ND	55	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	67	50-150				
Client ID:	SS M 002 004022					
Laboratory ID:	00_061_36					
Diosol Pango Organico	21	28		0 11 22	0 11 22	
	160	20 56		9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits	NWITTEDX	0-11-20	0-11-20	
o-Terphenyl	71	50-150				
e reiphenyr		00 100				
Client ID:	SS-M-004-091023					
Laboratory ID:	09-061-37					
Diesel Range Organics	31	29	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil	93	58	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	76	50-150				
Client ID:	SS-M-005-091023					
Laboratory ID:	09-061-38			0.44.00	0.44.00	
Diesel Range Organics	39	30	NWTPH-DX	9-11-23	9-11-23	
	170		NWIPH-DX	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
0-Terphenyi	04	50-750				
Client ID:	SS-M-006-091023					
Laboratory ID:	09-061-39					
Diesel Range Organics	77	31	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil	270	62	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	65	50-150				



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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-M-001-091023					
Laboratory ID:	09-061-40					
Diesel Range Organics	50	28	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil	160	56	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	72	50-150				
Client ID:	EB-M-002-091023					
Laboratory ID:	09-061-41					
Diesel Range Organics	770	27	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil Range Organics	350	54	NWTPH-Dx	9-11-23	9-11-23	N1 J
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	81	50-150				
Client ID:	EB-M-003-091023					
Laboratory ID:	09-061-42					
Diesel Range Organics	79	27	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil Range Organics	60	54	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	78	50-150				
Client ID:	DUP-004-091023					
Laboratory ID:	09-061-43					
Diesel Range Organics	98	28	NWTPH-Dx	9-11-23	9-11-23	
Lube Oil Range Organics	76	55	NWTPH-Dx	9-11-23	9-11-23	
Surrogate:	Percent Recoverv	Control Limits				
o-Terphenyl	87	50-150				



PCBs EPA 8082A

Matrix: Water Units: ug/L (ppb)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	RS-001-090923					
Laboratory ID:	09-061-31					
Aroclor 1016	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1221	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1232	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1242	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1248	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1254	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1260	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1262	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1268	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	88	55-138				
Client ID:	RS-002-091023					
Laboratory ID:	09-061-32					
Aroclor 1016	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1221	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1232	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1242	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1248	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1254	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1260	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1262	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Aroclor 1268	ND	0.047	EPA 8082A	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	92	55-138				

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% MOISTURE

Client ID	Lah ID	% Moisture	Date Analyzed
SS E 001 000023	00.061.01	10	0 11 23
SS-E-001-090923	09-001-01	10	9-11-23
55-E-002-090925	09-061-02	0	9-11-23
SS-E-003-090923	09-061-03	13	9-11-23
SS-E-004-090923	09-061-04	5	9-11-23
SS-E-005-090923	09-061-05	6	9-11-23
SS-E-006-090923	09-061-06	5	9-11-23
SS-E-007-090923	09-061-07	4	9-11-23
SS-E-008-090923	09-061-08	8	9-11-23
SS-E-009-090923	09-061-09	6	9-11-23
SS-E-010-090923	09-061-10	8	9-11-23
SS-E-011-090923	09-061-11	10	9-11-23
SS-E-012-090923	09-061-12	7	9-11-23
EB-E-001-090923	09-061-13	9	9-11-23
EB-E-002-090923	09-061-14	6	9-11-23
EB-E-003-090923	09-061-15	5	9-11-23
EB-E-004-090923	09-061-16	12	9-11-23
EB-E-005-090923	09-061-17	8	9-11-23
EB-E-006-090923	09-061-18	8	9-11-23
EB-E-007-090923	09-061-19	10	9-11-23
EB-E-008-090923	09-061-20	17	9-11-23
EB-E-009-090923	09-061-21	14	9-11-23
DUP-001-090923	09-061-23	7	9-11-23
DUP-002-090923	09-061-24	19	9-11-23
EB-N-001-090923	09-061-25	4	9-11-23
SS-N-001-090923	09-061-26	4	9-11-23
SS-N-002-090923	09-061-27	5	9-11-23
SS-N-003-090923	09-061-28	5	9-11-23



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Date of Report: September 13, 2023 Samples Submitted: September 11, 2023 Laboratory Reference: 2309-061 Project: 30092874.00003

% MOISTURE

Client ID	Lab ID	% Moisture	Date Analyzed
SS-N-004-090923	09-061-29	4	9-11-23
DUP-003-090923	09-061-30	4	9-11-23
SS-M-001-091023	09-061-34	7	9-11-23
SS-M-002-091023	09-061-35	9	9-11-23
SS-M-003-091023	09-061-36	10	9-11-23
SS-M-004-091023	09-061-37	13	9-11-23
SS-M-005-091023	09-061-38	18	9-11-23
SS-M-006-091023	09-061-39	19	9-11-23
EB-M-001-091023	09-061-40	11	9-11-23
EB-M-002-091023	09-061-41	8	9-11-23
EB-M-003-091023	09-061-42	7	9-11-23
DUP-004-091023	09-061-43	9	9-11-23



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United States Coast Guard

DATA REVIEW

Burrows Island Light Station Skagit County, Washington

Diesel Range Organic, Polychlorinated Biphenyls (PCBs) and Metal Analysis

SDG # 2309-099

Analyses Performed By: Onsite Environmental Inc. Redmond, Washington

Report #: 51777R Review Level: Tier II Project: 30092874.00004

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDG) # 2309-099 for samples collected in association with the United States Coast Guard, Burrows Island Light Station, Skagit County, Washington. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Comple ID	Lab ID	Metrix	Sample	Derent Comple		Analysi	S
Sample ID		Matrix	Date	Parent Sample	PCB	DRO	Metals
EB-K-001-091123	09-099-01	Soil	09/11/2023		х		Х
SS-K-001-091123	09-099-02	Soil	09/11/2023		Х		Х
SS-K-002-091123	09-099-03	Soil	09/11/2023		Х		Х
SS-K-003-091123	09-099-04	Soil	09/11/2023		Х		Х
SS-K-004-091123	09-099-05	Soil	09/11/2023		Х		Х
SS-K-005-091123	09-099-06	Soil	09/11/2023		Х		Х
SS-K-006-091123	09-099-07	Soil	09/11/2023		Х		Х
SS-K-007-091123	09-099-08	Soil	09/11/2023		Х		Х
DUP-005-091123	09-099-09	Soil	09/11/2023	SS-K-001-091123	Х		Х
OS-K-001-091123	09-099-10	Soil	09/11/2023		Х	Х	Х

Notes:

PCB Polychlorinated Biphenyls

DRO Diesel Organic Range

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed		Reported		Performance Acceptable		Not
		No	Yes	No	Yes	Required
1.	Sample receipt condition		Х		Х	
2.	Requested analyses and sample results		Х		Х	
3.	Master tracking list		Х		X	
4.	Methods of analysis		Х		X	
5.	Reporting limits		Х		Х	
6.	Sample collection date		Х		X	
7.	Laboratory sample received date		Х		х	
8.	Sample preservation verification (as applicable)		Х		Х	
9.	Sample preparation/extraction/analysis dates		Х		х	
10.	Fully executed Chain-of-Custody (COC) form		Х		Х	
11.	Narrative summary of Quality Assurance (QA) or sample problems provided		х		х	
12.	Data Package Completeness and Compliance		Х		X	

Note:

10. The Diesel Organic Range analysis was requested for all the samples; however, the laboratory had performed DRO analysis only on the sample OS-K-001-091123.

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8082A, and NWTPH-Dx. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA 540-R-2017-002, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no

compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8082A	Soil	1 year from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

MS/MSD analysis was not performed on samples from this SDG.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analysis exhibited recovery and RPD within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-K-001-091123/ DUP-005-091123	All compounds	U	U	AC

Notes:

AC Acceptable

U non-detect

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

The PCBs sample results were not qualified with the "P" qualifier by the laboratory therefore the dual column RPD results were assumed to be within the control limits.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

Pesticides: SW-846 8082A		Reported		mance otable	Not	
		Yes	No	Yes	Required	
Gas Chromatography/Electron Capture Detector (GC/	ECD)					
Tier II Validation						
Holding times		Х		X		
Reporting limits (units)		х		х		
Blanks						
A. Method blanks		Х		X		
B. Equipment blanks	Х				Х	
C. Rinse blank	Х				Х	
Laboratory Control Sample (LCS) %R		Х		Х		
Laboratory Control Sample Duplicate (LCSD) %R		Х		Х		
LCS/LCSD Precision (RPD)		Х		х		
Matrix Spike (MS) %R	Х				Х	
Matrix Spike Duplicate (MSD) %R	Х				Х	
MS/MSD RPD	Х				Х	
Field Duplicate Sample RPD		Х		Х		
Surrogate Spike Recoveries		Х		Х		
Column %D \leq 40% (If dual column is performed for reporting - not confirmation)	х				X	
Dilution Factor	Х				Х	
Moisture Content		Х		X		

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

DIESEL RANGE ORGANICS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
NWTPH-Dx	Soil	14 days from collection to extraction and40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field blanks also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds within exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed samples from this SDG.

5. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 50% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was performed on the sample EB-K-001-091123. The laboratory duplicate analysis exhibited RPD within the control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The RPD between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

7. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Sample ID/Duplicate ID Analyte		Duplicate Result (mg/Kg)	RPD
SS-K-001-091123/ DUP-005-091123	Lube Oil Range Organics	61	65	AC

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

8. System Performance and Overall Assessment

The laboratory qualified a few results with a "U1" qualifier to indicate: The practical quantitation limit is elevated due to interferences present in the sample. The qualifier was removed during validation.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR DIESEL RANGE ORGANICS ANALYSES

DIESEL RANGE ORGANICS ANALYSE:		orted	Perfor Acce	rmance ptable	Not
NWTPH-Dx	No	Yes	No	Yes	Required
Gas Chromatography/Flame Ionization Detector (GC/FID)				
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		Х		Х	
Blanks			-		
A. Method blanks		Х		Х	
B. Equipment/Field blanks	Х				Х
C. Rinse blanks	Х				Х
Surrogates Accuracy (%R)		Х		Х	
Matrix Spike (MS) %R	Х				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Control Sample (LCS) %R	Х				Х
Laboratory Control Sample Duplicate (LCSD) %R	Х				Х
LCS/LCSD RPD	Х				Х
Laboratory Duplicate Sample RPD		Х		Х	
Field Duplicate Sample RPD	Х				Х
Dilution Factor	Х				Х

Notes:

%RPercent recoveryRPDRelative percent difference%DPercent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010D. Data were reviewed in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 540-R-2017-001, January 2017) and Quality Assurance Project Plan, United States Coast Guard, Burrows Island Light Station, Skagit County, Washington (March 2019).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
 - J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - N Spiked sample recovery is not within the control limits.
 - * Duplicate analysis is not within the control limits.
- Validation Qualifiers
 - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010D	Soil	180 days from collection to analysis	Cool to < 6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the practical quantitation limit (PQL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the PQL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The relative percent difference (RPD) between the MS and MSD results must be no greater than the established acceptance limit of 20%. The MS/MSD recovery control limits do not apply for MS performed on samples where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS/MSD analysis was not performed on samples from this SDG.

3.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the RL. A control limit of 20% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of two times the RL for soil matrices.

The laboratory duplicate analysis was not performed on samples from this SDG.

4. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.

The LCS/LCSD results were not provided in the lab report, but were within the acceptable recovery limits as indicated by the laboratory.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate sample results. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the reporting limit (RL), a control limit of three times the RL for soil matrices is applied to the difference between the results.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/Kg)	Duplicate Result (mg/Kg)	RPD
SS-K-001-091123/ DUP-005-091123	Lead	38	37	AC

Note:

AC Acceptable

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010D		orted	Perfor Acce	rmance ptable	Not
	No	Yes	No	Yes	Required
Inductively Coupled Plasma - Atomic Emission Spect	rometry (I	CP-AES)			
Tier II Validation					
Holding Times		X		Х	
Reporting limits (units)		X		Х	
Blanks					
A. Method Blanks		X		Х	
B. Equipment/Field Blanks	Х				Х
Laboratory Control Sample (LCS) %R	X				Х
Laboratory Control Sample Duplicate (LCSD) %R	X				Х
LCS/LCSD Precision (RPD)	Х				Х
Matrix Spike (MS) %R	X				Х
Matrix Spike Duplicate (MSD) %R	Х				Х
MS/MSD Precision (RPD)	Х				Х
Laboratory Duplicate Sample (RPD)	X				Х
Field Duplicate Sample (RPD)		X		Х	
ICP Serial Dilution %D	X				Х
Reporting Limit Verification		X		Х	

Notes:%RPercent recoveryRPDRelative percent difference%DPercent difference

VALIDATION PERFORMED BY: Amrutha M

SIGNATURE:

Arutha.M $\cdot \cdot$

DATE: November 30, 2023

PEER REVIEW: Joseph C. Houser

DATE: November 30, 2023

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



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6 55-K-005-09/123	· (· · ·	1025	5	1				X													X	X		
7 55-K-006-091123	1	1030	S	1				4													X	X		
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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-K-001-091123					
Laboratory ID:	09-099-01					
Diesel Range Organics	ND	26	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	26	NWTPH-Dx	9-13-23	9-13-23	
Lube Oil Range Organics	ND	53	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	87	50-150				
	SS K 001 001123					
Laboratory ID:	00.000.02					
Discol Pango Organico	03-039-02 ND	27		0 12 22	0 12 22	
Minoral Oil Bango		27		9-13-23	9-13-23	
	ND 61	Z1 53		9-13-23	9-13-23	
Surrogate:	Percent Pecovery	Control Limits	INVVIETEDX	9-13-23	9-13-23	
o-Ternhenvl	Recovery	50_150				
0-Terphenyi	00	50-750				
Client ID:	SS-K-002-091123					
Laboratory ID:	09-099-03					
Diesel Range Organics	ND	28	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	33	NWTPH-Dx	9-13-23	9-13-23	Û h
Lube Oil Range Organics	130	56	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	73	50-150				
	SS-K-003-091123					
Laboratory ID:	09_099_04					
Diesel Range Organics	<u>00-000-04</u>	35		0-13-23	0-13-23	111
Mineral Oil Range		35 45		9-13-23	9-13-23	
Lube Oil	500	55	NWTPH-Dx	9-13-23	9-13-23	01
Surrogate:	Percent Recovery	Control Limits		0 10 20	0 10 20	
o-Terphenyl	79	50-150				
Client ID:	SS-K-004-091123					
Laboratory ID:	09-099-05					
Diesel Range Organics	ND	27	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	27	NWTPH-Dx	9-13-23	9-13-23	
Lube Oil Range Organics	98	53	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	80	50-150				



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DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-K-005-091123					
Laboratory ID:	09-099-06					
Diesel Range Organics	29	27	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	39	NWTPH-Dx	9-13-23	9-13-23	01
Lube Oil Range Organics	140	54	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	71	50-150				
Client ID:	SS-K-006-091123					
Laboratory ID:	09-099-07					
Diesel Range Organics	ND	28	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	28	NWTPH-Dx	9-13-23	9-13-23	
Lube Oil Range Organics	ND	56	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	60	50-150				
Client ID:	SS-K-007-091123					
Laboratory ID:	09-099-08					
Diesel Range Organics	ND	26	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	26	NWTPH-Dx	9-13-23	9-13-23	
Lube Oil	58	52	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recoverv	Control Limits				
o-Terphenyl	81	50-150				
Client ID:	DUP-005-091123					
Laboratory ID:	09-099-09					
Diesel Range Organics	ND	27	NWTPH-Dx	9-13-23	9-13-23	
Mineral Oil Range	ND	27	NWTPH-Dx	9-13-23	9-13-23	
Lube Oil	65	54	NWTPH-Dx	9-13-23	9-13-23	
Surrogate:	Percent Recovery	Control Limits				
o-Terphenyl	88	50-150				



DIESEL AND HEAVY OIL RANGE ORGANICS NWTPH-Dx

0 0 0 1 7				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	OS-K-001-091123					
Laboratory ID:	09-099-10					
Diesel Fuel #2	1300	27	NWTPH-Dx	9-18-23	9-18-23	`
Lube Oil Range Organics	ND	63	NWTPH-Dx	9-18-23	9-18-23	U1
Surrogate:	Percent Recovery	Control Limits				•
o-Terphenyl	88	50-150				



TOTAL LEAD EPA 6010D

Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-K-001-091123					
Laboratory ID:	09-099-01					
Lead	ND	5.3	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-001-091123					
Laboratory ID:	09-099-02					
Lead	38	5.3	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-002-091123					
Laboratory ID:	09-099-03					
Lead	13	5.6	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-003-091123					
Laboratory ID:	09-099-04					
Lead	27	5.5	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-004-091123					
Laboratory ID:	09-099-05					
Lead	ND	5.3	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-005-091123					
Laboratory ID:	09-099-06					
Lead	10	5.4	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-006-091123					
Laboratory ID:	09-099-07					
Lead	7.4	5.6	EPA 6010D	9-13-23	9-14-23	
Client ID:	SS-K-007-091123					
Laboratory ID:	09-099-08					
Lead	12	5.2	EPA 6010D	9-13-23	9-14-23	



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TOTAL LEAD EPA 6010D

			Date	Date	
Result	PQL	Method	Prepared	Analyzed	Flags
DUP-005-091123					
09-099-09					
37	5.4	EPA 6010D	9-13-23	9-14-23	
			0.020	0 20	
	Result DUP-005-091123 09-099-09 37	Result PQL DUP-005-091123	Result PQL Method DUP-005-091123	Result PQL Method Prepared DUP-005-091123 09-099-09	Result PQL Method Prepared Analyzed DUP-005-091123

Client ID:	OS-K-001-091123					
Laboratory ID:	09-099-10					
Lead	ND	5.3	EPA 6010D	9-13-23	9-14-23	



Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	EB-K-001-091123					
Laboratory ID:	09-099-01					
Aroclor 1016	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	5.2	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.26	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	70	50-127				
Client ID:	SS-K-001-091123					
Laboratory ID:	09-099-02					
Aroclor 1016	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.053	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	89	50-127				
Client ID:	SS-K-002-091123					
Laboratory ID:	09-099-03					
Aroclor 1016	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	0.83	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	69	50-127				



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Matrix: Soil Units: mg/Kg (ppm)

5 6 (T)				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-K-003-091123					
Laboratory ID:	09-099-04					
Aroclor 1016	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	2.9	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.16	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	78	50-127				
Client ID:	SS-K-004-091123					
Laboratory ID:	09-099-05					
Aroclor 1016	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	11	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.53	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	80	50-127				
Client ID:	SS-K-005-091123					
Laboratory ID:	09-099-06					
Aroclor 1016	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	15	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	1.1	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	80	50-127				



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Matrix: Soil Units: mg/Kg (ppm)

				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	SS-K-006-091123					
Laboratory ID:	09-099-07					
Aroclor 1016	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	0.32	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.056	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	77	50-127				
Client ID:	SS-K-007-091123					
Laboratory ID:	09-099-08					
Aroclor 1016	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	0.29	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.052	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	77	50-127				
Client ID:	DUP-005-091123					
Laboratory ID:	09-099-09					
Aroclor 1016	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1221	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1232	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1242	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1248	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1254	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1260	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1262	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Aroclor 1268	ND	0.054	EPA 8082A	9-13-23	9-14-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	82	50-127				



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0 0 0 1 7				Date	Date	
Analyte	Result	PQL	Method	Prepared	Analyzed	Flags
Client ID:	OS-K-001-091123					
Laboratory ID:	09-099-10					
Aroclor 1016	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1221	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1232	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1242	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1248	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1254	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1260	3.5	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1262	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Aroclor 1268	ND	0.27	EPA 8082A	9-18-23	9-18-23	
Surrogate:	Percent Recovery	Control Limits				
DCB	65	50-127				



% MOISTURE

			Date
Client ID	Lab ID	% Moisture	Analyzed
EB-K-001-091123	09-099-01	5	9-13-23
SS-K-001-091123	09-099-02	6	9-13-23
SS-K-002-091123	09-099-03	10	9-13-23
SS-K-003-091123	09-099-04	8	9-13-23
SS-K-004-091123	09-099-05	6	9-13-23
SS-K-005-091123	09-099-06	8	9-13-23
SS-K-006-091123	09-099-07	11	9-13-23
SS-K-007-091123	09-099-08	4	9-13-23
DUP-005-091123	09-099-09	7	9-13-23
OS-K-001-091123	09-099-10	6	9-13-23



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