High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry
PCCDs/PCDFs (EPA Method 1613B)
Stage 2A Review
Data Quality Control (QC)

Site: PHSS-Swan Island Basin	SDG #: 20568
Laboratory: CFA	Project #: DT2002.03.03.04.01
HydroGeoLogic, Inc. Validator: John Tracy	Validation Date: 07.20.23
HGL Peer Reviewer: Ken Rapuano	Peer Review Date: 8.3.23

Client Sample ID	Laboratory Sample ID	Matrix
SIB-098-OHW-0-1-10072022	20568001	Riverbank Soil
SIB-098-TOB-0-1-10072022	20568002	Riverbank Soil
SIB-098-MLW-0-1-10072022	20568003	Riverbank Soil
SIB-097-MLW-0-1-10072022	20568004	Riverbank Soil
SIB-097-OHW-0-1-10072022	20568005	Riverbank Soil
SIB-097-TOB-0-1-10072022	20568006	Riverbank Soil
SIB-096-MLW-0-1-10072022	20568007	Riverbank Soil
SIB-096-OHW-0-1-10072022	20568008	Riverbank Soil
SIB-096-TOB-0-1-10072022	20568009	Riverbank Soil
SIB-095-MLW-0-1-10072022	20568010	Riverbank Soil
SIB-095-OHW-0-1-10072022	20568011	Riverbank Soil
SIB-095-TOB-0-1-10072022	20568012	Riverbank Soil
FD03-10072022	20568013	Riverbank Soil
SIB-094-MLW-0-1-10072022	20568014	Riverbank Soil
SIB-094-OHW-0-1-10072022	20568015	Riverbank Soil
SIB-094-TOB-0-1-10072022	20568016	Riverbank Soil
SIB-093-MLW-0-1-10072022	20568017	Riverbank Soil
SIB-093-OHW-0-1-10072022	20568018	Riverbank Soil
SIB-093-TOB-0-1-10072022	20568019	Riverbank Soil
SIB-092-MLW-0-1-10102022	20568020	Riverbank Soil
SIB-092-OHW-0-1-10102022	20568021	Riverbank Soil
SIB-092-TOB-0-1-10102022	20568022	Riverbank Soil
SIB-091-MLW-0-1-10102022	20568023	Riverbank Soil
SIB-091-MLW-0-1-10102022 MS	20568024	Riverbank Soil
SIB-091-MLW-0-1-10102022 MSD	20568025	Riverbank Soil

The following Stage 2A review was performed on the requested analyses. No results were rejected, and analytical completeness is 100%.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No completeness issues were noted.

Qualification: None required.

Sample Delivery and Condition – With the exception of several labeling discrepancies, which were resolved, all samples arrived intact at the laboratory in acceptable condition and temperature and were properly preserved. The laboratory used sample SIB-091-MLW-0-1-10102022 for MS/MSD analysis instead of sample SIB-095-OHW-0-1-10072022 as requested on the chain of custody. This change was approved by HGL, and no further action is required. No other discrepancies were noted.

Qualification: None required.

Holding Times – All samples were prepared and analyzed within their required holding times.

Qualification: None required.

Method Blanks – The method 1613B method blank in batch 51886 was contaminated with the following analytes:

- 0.300 pg/g of 1,2,3,4,6,7,8-HpCDD, leading to a qualification limit of 1.50 pg/g (15.0 pg/g for 5x dilutions)
- 0.656 pg/g of 1,2,3,4,6,7,8,9-OCDD, leading to a qualification limit of 3.28 pg/g (32.8 pg/g for 5x dilutions)
- 0.200 pg/g of 1,2,3,7,8-PeCDF, leading to a qualification limit of 1.00 pg/g (10.0 pg/g for 5x dilutions)
- 0.222 pg/g of 1,2,3,4,7,8-HxCDF, leading to a qualification limit of 1.11 pg/g (11.1 pg/g for 5x dilutions)
- 0.144 pg/g of 1,2,3,6,7,8-HxCDF, leading to a qualification limit of 0.720 pg/g (7.20 pg/g for 5x dilutions)
- 0.374 pg/g of 1,2,3,4,6,7,8-HpCDF, leading to a qualification limit of 1.87 pg/g (9.35 pg/g for 5x dilutions), respectively

All associated detections at or below qualification limits should be qualified U-MBL.

The method 1613B method blank in batch 52079 was contaminated with 0.618 pg/g of 1,2,3,4,6,7,8,9-OCDD and 0.414 pg/g of 1,2,3,4,6,7,8-HpCDF, leading to qualification limits of 3.09 pg/g and 2.07 pg/g, respectively. All associated results are detections above the qualification limits and no qualification is required.

***Qualification:* The following results were qualified U-MDL:**

- **1,2,3,7,8-PeCDF results in samples SIB-097-MLW-0-1-10072022, SIB-095-MLW-0-1-10072022, SIB-094-MLW-0-1-10072022, SIB-093-MLW-0-1-10072022, SIB-092-MLW-0-1-10102022, and SIB-091-MLW-0-1-10102022**
- **1,2,3,4,7,8-HxCDF results in samples SIB-096-MLW-0-1-10072022, SIB-095-MLW-0-1-10072022, SIB-094-MLW-0-1-10072022, SIB-093-MLW-0-1-10072022, SIB-092-MLW-0-1-10102022, and SIB-091-MLW-0-1-10102022**
- **1,2,3,6,7,8-HxCDF result in sample SIB-091-MLW-0-1-10102022**
- **1,2,3,4,6,7,8-HpCDF results in samples SIB-096-MLW-0-1-10072022, SIB-094-MLW-0-1-10072022, and SIB-093-MLW-0-1-10072022**

Rinsate Blanks – Rinse blank EB01-10052022 (results reported in SDG 20574) is associated with all samples in this SDG with sample date 10/07/2022 and was free from contamination. Rinse blank EB02-10102022 (results reported in SDG 20574) is associated with all samples in this SDG with sample date 10/10/2022 and was free from contamination with the exception of 1,2,3,4,6,7,8,9-OCDD; however, this OCDD result was not substantially different from the corresponding result reported in the method blank associated with this EB. The detected OCDD result reported for EB02-10102022 represents contamination associated with aqueous sample preparation and is not related to cross-contamination in the field. No additional qualification is required.

Qualification: None required.

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) – All LCS/LCSD %Rs and RSDs were within QAPP control limits.

Qualification: None required.

Surrogates – All surrogates (labeled standards) were within control limits.

Qualification: None required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) – An MS/MSD was performed using sample SIB-091-MLW-0-1-10102022. All %Rs were within QAPP control limits with the exception of 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD recovering above control limits. These results should be qualified J-MSH in the parent sample. All RSDs were within control limits.

***Qualification:* The 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD results in sample SIB-095-OHW-0-1-10102022 are qualified J-MSH.**

Field Duplicate – Sample FD03-10072022 was submitted as a field duplicate of sample SIB-095-TOB-0-1-10072022. All precision criteria were met with the exception of 1,2,3,4,6,7,8-HpCDD, which failed RPD criteria. These results should be qualified J-FDPR.

***Qualification:* The 1,2,3,4,6,7,8-HpCDD results in samples FD03-10072022 and SIB-095-TOB-0-1-10072022 are qualified J-FDPR.**

Compound Quantitation – Analyte non-detections were reported as the EDL and qualified U. Analytes detected between the EDL and PQL were reported as J-qualified results by the laboratory. These J qualifiers were retained unless superseded by a more severe qualifier.

If a detected analyte has an ion ration outside the characteristic ion ratio window, the result is reported as an estimated maximum potential concentration. All results reported as an EMPC (a "K" flag is present in the laboratory qualifier) are qualified J-EMPC unless superseded by a higher priority qualifier.

2,3,7,8-TCDF is not fully resolved on the DB-5MS column; when detected above the PQL on the DB-5MS column, the result was confirmed on a DB-225 column using the instrument ID listed in the case narrative. In cases where two results are reported for 2,3,7,8-TCDF for a sample, the result from the DB-225 column is selected for use and the result from the DB-5MS is qualified DNR-EXC.

In cases where a target analyte is detected at a concentration above the calibrated range, the laboratory's practice is to report the result with a laboratory qualifier of E without running a dilution so long as the detector is not saturated. The OCDD results for 2 affected samples are qualified J-ACR.

***Qualification:* The following results are qualified:**

- **All results reported with a laboratory qualifier of K are qualified J with reason code EMPC.**
- **All 2,3,7,8-TCDF results reported from the DB-5MS column that are paired with a 2,3,7,8-TCDF result from the DB-225 column are qualified DNR, reason code EXC; note that the reportable_result field for these results are populated with "Yes" by the laboratory and are changed to "No" for the affected results.**
- **2 OCDD results reported with a laboratory qualifier of E are qualified J with reason code ACR; note that the reportable_result field for these results are populated with "No" by the laboratory and are changed to "Yes" for the affected results.**
- **One Heptachloro-p-dioxin result reported with a laboratory qualifier of E has the reportable_result field populated with "No" by the laboratory and is changed to "Yes". Although total congener results are not validated, this result is reportable.**

Qualification Summary Table (results in pg/g):

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-098-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.05	--	1.05	DNR	EXC
SIB-098-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.25	--	1.25	DNR	EXC
SIB-098-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.39	K	2.39	J	EMPC
SIB-098-MLW-0-1-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.681	JK	0.681	J	EMPC
SIB-098-MLW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.582	JK	0.582	J	EMPC
SIB-098-MLW-0-1-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1.21	JK	1.21	J	EMPC
SIB-097-MLW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.37	BJ	0.37	U	MBL
SIB-097-OHW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.59	JK	1.59	J	EMPC
SIB-097-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.77	--	4.77	DNR	EXC
SIB-097-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.63	K	4.63	J	EMPC
SIB-097-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.445	JK	0.445	J	EMPC
SIB-097-TOB-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.48	JK	1.48	J	EMPC
SIB-097-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.6	--	3.6	DNR	EXC
SIB-096-MLW-0-1-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.02	BJK	1.02	UJ	MBL,EMPC
SIB-096-MLW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.234	BJK	0.234	UJ	MBL,EMPC
SIB-096-MLW-0-1-10072022	OCTACHLORODIBENZOFURAN	1.05	JK	1.05	J	EMPC
SIB-096-OHW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	37.6	K	37.6	J	EMPC
SIB-096-OHW-0-1-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	19.4	JK	19.4	J	EMPC
SIB-096-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	6.95	--	6.95	DNR	EXC
SIB-096-OHW-0-1-10072022	OCTACHLORODIBENZO-P-DIOXIN	24900	E	24900	J	ACR
SIB-096-TOB-0-1-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	2.08	JK	2.08	J	EMPC
SIB-096-TOB-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.821	JK	0.821	J	EMPC
SIB-096-TOB-0-1-10072022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	1.67	JK	1.67	J	EMPC
SIB-096-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.64	K	1.64	DNR	EXC
SIB-095-MLW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.04	BJ	1.04	U	MBL
SIB-095-MLW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.383	JK	0.383	J	EMPC
SIB-095-MLW-0-1-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.417	JK	0.417	J	EMPC
SIB-095-MLW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.325	BJK	0.325	UJ	MBL,EMPC
SIB-095-OHW-0-1-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.841	JK	0.841	J	EMPC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-095-OHW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.466	JK	0.466	J	EMPC
SIB-095-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.77	K	1.77	DNR	EXC
SIB-095-TOB-0-1-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	60.6	--	60.6	J	FDPR
SIB-095-TOB-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	4.61	JK	4.61	J	EMPC
SIB-095-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.18	K	3.18	DNR	EXC
FD03-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	110	--	110	J	FDPR
FD03-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.78	--	3.78	DNR	EXC
FD03-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.36	K	2.36	J	EMPC
FD03-10072022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.279	JK	0.279	J	EMPC
SIB-094-MLW-0-1-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.4	BJ	0.4	U	MBL
SIB-094-MLW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.11	BJ	0.11	U	MBL
SIB-094-MLW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.193	BJK	0.193	UJ	MBL,EMPC
SIB-094-MLW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.299	JK	0.299	J	EMPC
SIB-094-OHW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	2.56	JK	2.56	J	EMPC
SIB-094-OHW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.51	JK	1.51	J	EMPC
SIB-094-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.01	--	4.01	DNR	EXC
SIB-094-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.7	K	1.7	J	EMPC
SIB-094-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.452	JK	0.452	J	EMPC
SIB-094-TOB-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	6.22	K	6.22	J	EMPC
SIB-094-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	13.2	--	13.2	DNR	EXC
SIB-094-TOB-0-1-10072022	OCTACHLORODIBENZO-P-DIOXIN	9560	E	9560	J	ACR
SIB-093-MLW-0-1-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.931	BJ	0.931	U	MBL
SIB-093-MLW-0-1-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.14	BJ	0.14	U	MBL
SIB-093-MLW-0-1-10072022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.261	JK	0.261	J	EMPC
SIB-093-MLW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.221	BJK	0.221	UJ	MBL,EMPC
SIB-093-OHW-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.32	JK	1.32	J	EMPC
SIB-093-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.75	--	3.75	DNR	EXC
SIB-093-OHW-0-1-10072022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1.4	K	1.4	J	EMPC
SIB-093-TOB-0-1-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	2.06	JK	2.06	J	EMPC
SIB-093-TOB-0-1-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.35	--	4.35	DNR	EXC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-092-MLW-0-1-10102022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.666	JK	0.666	J	EMPC
SIB-092-MLW-0-1-10102022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.889	BJ	0.889	U	MBL
SIB-092-MLW-0-1-10102022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.379	BJ	0.379	U	MBL
SIB-092-OHW-0-1-10102022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.18	JK	2.18	J	EMPC
SIB-092-OHW-0-1-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.58	K	1.58	DNR	EXC
SIB-092-TOB-0-1-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	3.05	K	3.05	J	EMPC
SIB-092-TOB-0-1-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	11.6	--	11.6	DNR	EXC
SIB-091-MLW-0-1-10102022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	3.59	J	3.59	J	MSH
SIB-091-MLW-0-1-10102022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.293	BJ	0.293	U	MBL
SIB-091-MLW-0-1-10102022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.217	BJ	0.217	U	MBL
SIB-091-MLW-0-1-10102022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.317	BJK	0.317	UJ	MBL,EMPC
SIB-091-MLW-0-1-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.374	JK	0.374	J	EMPC
SIB-091-MLW-0-1-10102022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.167	JK	0.167	J	EMPC
SIB-091-MLW-0-1-10102022	OCTACHLORODIBENZO-P-DIOXIN	28.2	--	28.2	J	MSH