APPENDIX L

CHEMISTRY DATA VALIDATION REPORTS

Chemistry Data Validation Summary Tables

Water

Table L-1.
2018 RHMP Laboratory Data Validation Report Summary - Seawater

Compound Group	Qualification	Compound(s)	Compound(s)	Flag(s)	Issue	Stations Affected Count	Analytes Count	Samples Affected Count	Number of SDGs affected	% of RHMP Samples Affected (78 total [75 + 3 field reps])	% of SDGs affected (9 total)
Metals	CRM Recovery	Silver (Ag), Dissolved	Silver (Ag), Dissolved	UJ	%R below acceptable limit	7	1	7	1	9%	11%
		Silver (Ag), Total	Silver (Ag), Total	UJ	%R below acceptable limit	7	1	7	1	9%	11%
		Zinc (Zn), Dissolved	Zinc (Zn), Dissolved	J	%R above acceptable limit	10	1	10	1	13%	11%
		Zinc (Zn), Total	Zinc (Zn), Total	J	%R above acceptable limit	10	1	10	1	13%	11%
	Holding Time Exceedance	Mercury (Hg), Dissolved	Mercury (Hg), Dissolved	UJ	Holding Time Exceedance	73	1	73	7	94%	78%
		Mercury (Hg), Total	Mercury (Hg), Total	UJ	Holding Time Exceedance	73	1	73	7	94%	78%
	MS/MSD	Aluminum (Al), Total	Aluminum (Al), Total	J	%R above acceptable limit	23	1	23	2	29%	22%
		Aluminum (Al), Total	Aluminum (Al), Total	J	%R below acceptable limit	14	1	14	2	18%	22%
		Antimony (Sb), Dissolved	Antimony (Sb), Dissolved	J	%R above acceptable limit	7	1	7	1	9%	11%
		Antimony (Sb), Total	Antimony (Sb), Total	J	%R below acceptable limit	68	1	68	9	87%	100%
		Beryllium (Be), Total	Beryllium (Be), Total	J,UJ	%R below acceptable limit	40	1	40	4	51%	44%
		Iron (Fe), Dissolved	Iron (Fe), Dissolved	J	%R below acceptable limit	1	1	1	1	1%	11%
		Iron (Fe), Total	Iron (Fe), Total	J	%R below acceptable limit	42	1	42	6	54%	67%
		Manganese (Mn), Total	Manganese (Mn), Total	J	%R below acceptable limit	19	1	19	2	24%	22%
		Silver (Ag), Total	Silver (Ag), Total	J	%R below acceptable limit	13	1	13	2	17%	22%
		Tin (Sn), Total	Tin (Sn), Total	J	%R below acceptable limit	5	1	5	2	6%	22%
		Titanium (Ti), Total	Titanium (Ti), Total	J	%R above acceptable limit	12	1	12	3	15%	33%
		Titanium (Ti), Total	Titanium (Ti), Total	J	%R below acceptable limit	27	1	27	4	35%	44%
PAHs	LCS/LCSD Recovery	1-Methylnaphthalene, Total	1-Methylnaphthalene, Total	UJ, J	%R below acceptable limit	29	1	29	3	37%	33%
		2,6-Dimethylnaphthalene	2,6-Dimethylnaphthalene	UJ, J	%R below acceptable limit	17	1	17	2	22%	22%
		2-Methylnaphthalene, Total	2-Methylnaphthalene, Total	UJ, J	%R below acceptable limit	29	1	29	3	37%	33%
		Acenaphthene	Acenaphthene	J, UJ	%R below acceptable limit	17	1	17	2	22%	22%
		Biphenyl	Biphenyl	J, UJ	%R below acceptable limit	17	1	17	2	22%	22%
		Naphthalene, Total	Naphthalene, Total	J	%R above acceptable limit	1	1	1	1	1%	11%
		Naphthalene, Total	Naphthalene, Total	J, UJ	%R below acceptable limit	33	1	33	4	42%	44%
	MS/MSD	1-Methylnaphthalene, Total	1-Methylnaphthalene, Total	UJ	%R below acceptable limit	1	1	1	1	1%	11%
		2-Methylnaphthalene, Total	2-Methylnaphthalene, Total	UJ	%R below acceptable limit	1	1	1	1	1%	11%
		Naphthalene, Total	Naphthalene, Total	UJ (all non-detects)	%R below acceptable limit	2	1	2	2	3%	22%
Wet Chemistry	Holding Time Exceedance	Nitrate as N	Nitrate as N	J, R	Holding Time Exceedance	78	1	78	9	100%	100%
		Total Orthophosphate as P	Total Orthophosphate as P	J, R	Holding Time Exceedance	77	1	77	8	99%	89%

Red Text indicates "R" Flag

Black Text with red highlight indicates those that affect 50% or more of the samples

Sediment

Table L-2.
2018 RHMP Laboratory Data Validation Report Summary - Sediment

Compund Group	Qualification	Compund(s)	Flag(s)	Issue	% of RHMP Samples Affected (78 total [75 + 3 field reps])	% of SDGs affected (9 total)
Chlorinated Pesticides	CRM Recovery	gamma-Chlordane	J, NA	%R above acceptable limit	24%	56%
		gamma-Chlordane	NA, J	RPD above limit	4%	11%
		Endrin aldehyde	NA	RPD above limit	24%	22%
	Duplicate Sample Analysis	Endosulfan I, Endrin aldehyde	NA	RPD above limit	4%	11%
	LCS/LCSD Recovery	Methoxychlor, Perthane	NA	%R above acceptable limit	95%	100%
		Endosulfan II, Endrin aldehyde, alpha-BHC, Hexachlorobenzene	UJ (all non-detects)	%R below acceptable limit	24%	44%
		Endosulfan II, Endrin aldehyde, alpha-Chlordane, cis-Nonachlor	J, UJ	%R below acceptable limit	24%	33%
		Dicofol, Endosulfan I, Endosulfan II, Endrin aldehyde	UJ (all non-detects)	%R below acceptable limit	26%	33%
		Endosulfan II, Endrin aldehyde	UJ	%R below acceptable limit	26%	22%
		Endosulfan I	R	%R below acceptable limit	74%	89%
		Endrin aldehyde	NA	RPD above limit	26%	33%
		Endosulfan II	NA	RPD above limit	6%	11%
		Endosulfan I, Endrin aldehyde	NA	RPD above limit	14%	11%
	MS/MSD	Methoxychlor, Perthane	NA	%R above acceptable limit	4%	33%
		Dicofol, Endosulfan I, Endosulfan II, Endrin aldehyde	UJ (all non-detects)	%R below acceptable limit	1%	11%
		Endosulfan I	R	%R below acceptable limit	1%	11%
		Endosulfan II, Endrin aldehyde	UJ (all non-detects)	%R below acceptable limit	1%	11%
		Endosulfan I, Endosulfan II, Endrin aldehyde	UJ (all non-detects)	%R below acceptable limit	3%	22%
		Endrin aldehyde	NA	RPD above limit	5%	44%
Fipronyls	MS/MSD	Fipronil desulfinyl	NA	%R above acceptable limit	1%	11%
Metals	CRM Recovery	Aluminum	J	%R above acceptable limit	27%	11%
		Iron	J	%R slightly above acceptable limit	21%	33%
		Aluminum	J	RPD slightly above limit	10%	11%
	Duplicate Sample Analysis	Chromium	J	RPD above limit	5%	11%
		Barium	J	RPD above limit	12%	11%
		Cadmium	J	RPD slightly above limit	17%	11%
	Holding Time Exceedance	Mercury	J	Holding Time Exceedance	100%	100%
	LCS/LCSD Recovery	Aluminum	J	%R above acceptable limit	22%	11%
	MS/MSD	Barium	J	%R above acceptable limit	17%	22%
		Mercury	J	%R above acceptable limit	26%	22%
		Iron	J	%R below acceptable limit	12%	11%
		Silver	UJ (all non-detects)	%R below acceptable limit	13%	11%
		Chromium	J	%R slightly above acceptable limit	5%	11%
		Barium	J	RPD above limit	18%	22%
		Aluminum, Iron	J	RPD above limit	22%	22%
PAHs	CRM Recovery	Benzo(k)fluoranthene	J	%R below acceptable limit	49%	67%
		2-Methylnaphthalene	J	%R slightly below acceptable limit	26%	33%
	Duplicate Sample Analysis	Acenaphthene	NA	RPD above limit	1%	11%
		Benzo(a)pyrene, Benzo(e)pyrene, Benzo(k)fluoranthene, Chrysene, Fluoranthene, Pyrene	J	RPD above limit	1%	11%
		Anthracene, Chrysene, Dibenzo(a,h)anthracene, Dibenzothiophene, Fluoranthene, Phenanthrene, Pyrene	J	RPD above limit	1%	11%
		1-Methylnaphthalene, 2,6-Dimethylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Dibenzo(a,h)anthracene, Fluorene, Naphthalene	J	RPD above limit	1%	11%
		1-Methylnaphthalene, 2-Methylnaphthalene	J	RPD slightly above limit	1%	11%
	LCS/LCSD Recovery	Benzo(a)anthracene, Indeno(1,2,3-cd)pyrene	J	%R above acceptable limit	26%	33%
		1-Methylnaphthalene, 2-Methylnaphthalene, Biphenyl, Naphthalene, 2,6-Dimethylnaphthalene, Acenaphthene	J	%R below acceptable limit	76%	78%
		Anthracene	J	%R slightly below acceptable limit	24%	44%

Table L-2.
2018 RHMP Laboratory Data Validation Report Summary - Sediment

Compund Group	Qualification	Compund(s)	Flag(s)	Issue	% of RHMP Samples Affected (78 total [75 + 3 field reps])	% of SDGs affected (9 total)
PAHs	MS/MSD	Benzo(a)anthracene, Benzo(b)fluoranthene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Fluoranthene	J	%R above acceptable limit	1%	11%
		Benzo(b)fluoranthene, Fluoranthene	J	%R above acceptable limit	1%	11%
		2-Methylnaphthalene	J	%R below acceptable limit	1%	11%
		Naphthalene	J	%R below acceptable limit	4%	33%
		1-Methylnaphthalene	J	%R below acceptable limit	3%	22%
		Benzo(a)anthracene	J	%R slightly above acceptable limit	1%	11%
		Naphthalene	J	RPD above limit	1%	11%
		2-Methylnaphthalene	J	RPD slightly above limit	1%	11%
PBDEs	Duplicate Sample Analysis	PBDE 099, PBDE 100, PBDE 153, PBDE 154, PBDE 209	J	RPD above limit	1%	11%
	LCS/LCSD Recovery	PBDE 190, PBDE 209	J, UJ	%R below acceptable limit	76%	56%
		PBDE 209	J, NA	RPD above limit	32%	22%
	MS/MSD	PBDE 183, PBDE 190, PBDE 209	J, UJ	%R below acceptable limit	5%	44%
		PBDE 183, PBDE 209	NA, J	%R slightly above acceptable limit	3%	11%
		PBDE 190, PBDE 209	NA	RPD above limit	3%	22%
PCBs	CRM Recovery	PCB-105, PCB-118, PCB-128, PCB-156, PCB-206	J, UJ	%R below acceptable limit	35%	44%
		PCB-105, PCB-118, PCB-156	J, UJ	%R below acceptable limit	44%	67%
		PCB-128, PCB-156	J, UJ	RPD above limit	22%	11%
	Duplicate Sample Analysis	PCB-099, PCB-180, PCB-209	J	RPD above limit	1%	11%
		PCB-031	J	RPD slightly above limit	1%	11%
	LCS/LCSD Recovery	PCB-180, PCB-206, PCB-209	J	%R above acceptable limit	24%	44%
		PCB-169, PCB-189,PCB-195	NA, J	%R above acceptable limit	82%	89%
		PCB-003, PCB-005	UJ (all non-detects)	%R below acceptable limit	24%	44%
		PCB-049	J	RPD slightly above limit	1%	11%
	MS/MSD	PCB-189, PCB-194, PCB-195, PCB-206	NA	%R slighly above limit	1%	11%
		PCB-099, PCB-118, PCB-138, PCB-158, PCB-177, PCB-206	J	RPD slightly above limit	1%	11%
Synthetic Pyrethroid Pesticides	Duplicate Sample Analysis	Danitol (Fenpropathrin)	J	RPD slightly above limit	1%	11%
	MS/MSD	Allethrin	UJ	%R above acceptable limit	1%	11%
		Cyhalothrin, total lambda	NA	%R above acceptable limit	4%	33%
		Permethrin, cis-	NA, UJ	%R above acceptable limit	3%	22%
		Deltamethrin/Tralomethrin, Prallethrin	UJ	%R below acceptable limit	1%	11%
		Prallethrin	NA, UJ	%R below acceptable limit	4%	33%
		Deltamethrin/Tralomethrin, Prallethrin	NA	RPD above limit	1%	11%
		Fluvalinate, Prallethrin	NA	RPD above limit	1%	11%
		Prallethrin	NA	RPD slightly above limit	1%	11%
Wet Chemistry	Duplicate Sample Analysis	Grain size (Phi 1.5)	J	RPD above limit	17%	11%
		Grain size-Phi 2.0	J, UJ	RPD slightly above limit	22%	11%
	Holding Time Exceedance	Total nitrogen	R	Holding Time Exceedance	3%	11%
		AVS, Ammonia as N, Total Nitrogen	J	Holding Time Exceedance	100%	100%
	MS/MSD	AVS	J	%R below acceptable limit	45%	44%

Red Text indicates "R" Flag

Black Text with red highlight indicates those that affect 50% or more of the samples

Chemistry Data Validation Reports (LDC)

Water

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Wood Environment & Infrastructure
9210 Sky Park Ct
San Diego, CA 92123
Attn: Ms. Corey Sheredy
corey.sheredy@woodplc.com

July 31, 2019

SUBJECT: 2018 Regional Harbor Monitoring Program, Data Validation

Dear Ms. Sheredy

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 27, 2019. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #45386:

SDG #	Fraction
1807003-001, 1807003-003 1807003-005, 1807003-007 1807003-009, 1807003-011 1807003-013, 1807003-015 1807003-017	Polynuclear Aromatic Hydrocarbons, Metals, Wet Chemistry

The data validation was performed under Level II & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California; August 2013
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review, January 2017
- USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review; January 2017
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

Level II/IV - Client Select

LDC #45386 (Wood Environment & Infrastructure Solutions-San Diego, CA / 2018 Regional Harbor Monitoring Program)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAH (625)		Metals (1640 /200.8 /245.7)		Diss. Metals (1640 /200.8 /245.7)		NH_3-N (4500)		DOC (5310B)		MBAS (5540C)		NO_3-N (4500E)		Oil & Grease (1664B)		PO_4 P. (4500 PE)		TSS (2540D)															
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	1807003-001	06/27/19	07/19/19	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0														
B	1807003-003	06/27/19	07/19/19	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0														
C	1807003-005	06/27/19	07/19/19	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0														
D	1807003-007	06/27/19	07/19/19	9	0	9	0	9	0	9	0	9	0	9	0	9	0	9	0	9	0	9	0														
D	1807003-007	06/27/19	07/19/19	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0														
E	1807003-009	06/27/19	07/19/19	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0														
F	1807003-011	06/27/19	07/19/19	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0														
G	1807003-013	06/27/19	07/19/19	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0														
H	1807003-015	06/27/19	07/19/19	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0														
I	1807003-017	06/27/19	07/19/19	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0														
Total	J/PG			79	0	79	0	79	0	79	0	79	0	79	0	79	0	79	0	79	0	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	790

Shaded cells indicate Level IV validation (all other cells are Level II review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

LDC Report# 45386A2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 10, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-001

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SW-EB	56370	Water	07/10/18
B18-10065	56371	Water	07/10/18
B18-10066	56372	Water	07/10/18
B18-10067	56373	Water	07/10/18
B18-10068	56374	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

The chain-of-custodies were reviewed for documentation of cooler temperatures. Cooler temperatures all samples was reported at 10.9°C upon receipt by the laboratory.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SW-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

No field replicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-001	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-001

Sample	Compound	Flag	A or P	Reason (Code)
B18-SW-EB B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-001

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-001

No Sample Data Qualified in this SDG

LDC #: 45386A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/9/19
SDG #: 1807003-001 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	~~SW/A~~	Temp @ 10.9°c ~~SW/A~~ Text
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	B18-SW-EB	56370	Water	07/10/18
2	B18-10065	56371	Water	07/10/18
3	B18-10066	56372	Water	07/10/18
4	B18-10067	56373	Water	07/10/18
5	B18-10068	56374	Water	07/10/18
6				
7				
8				

Notes:

	0-20036						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-001

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SW-EB	56370	Water	07/10/18
B18-10065	56371	Water	07/10/18
B18-10066	56372	Water	07/10/18
B18-10067	56373	Water	07/10/18
B18-10068	56374	Water	07/10/18
B18-SW-EBF	56370F	Water	07/10/18
B18-10065F	56371F	Water	07/10/18
B18-10066F	56372F	Water	07/10/18
B18-10067F	56373F	Water	07/10/18
B18-10068F	56374F	Water	07/10/18
B18-10065MS	56371MS	Water	07/10/18
B18-10065MSD	56371MSD	Water	07/10/18
B18-10065DUP	56371DUP	Water	07/10/18
B18-10066MS	56372MS	Water	07/10/18
B18-10066MSD	56372MSD	Water	07/10/18
B18-10066DUP	56372DUP	Water	07/10/18
B18-10068MS	56374MS	Water	07/10/18
B18-10068MSD	56374MSD	Water	07/10/18
B18-10068DUP	56374DUP	Water	07/10/18
B18-10065FDUP	56371FDUP	Water	07/10/18
B18-10066FDUP	56372FDUP	Water	07/10/18
B18-10068FDUP	56374FDUP	Water	07/10/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-SW-EB B18-10065 B18-10066 B18-10067 B18-10068 B18-SW-EBF B18-10065F B18-10066F B18-10067F B18-10068F	Mercury	45	28	UJ (all non-detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples B18-SW-EB and B18-SW-EBF were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
B18-SW-EB	07/10/18	Cadmium Copper Lead Molybdenum Nickel Tin Zinc	0.0242 ug/L 0.0762 ug/L 0.0276 ug/L 0.034 ug/L 0.0206 ug/L 0.0303 ug/L 3.98 ug/L	B18-10065 B18-10066 B18-10067 B18-10068

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
B18-SW-EBF	07/10/18	Antimony Cadmium Copper Iron Lead Tin Titanium Zinc	0.0125 ug/L 0.00412 ug/L 0.113 ug/L 2.75 ug/L 0.0101 ug/L 0.0191 ug/L 0.0443 ug/L 2.12 ug/L	B18-10065F B18-10066F B18-10067F B18-10068F

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
B18-10065	Cadmium Lead Zinc	0.0432 ug/L 0.0859 ug/L 13.3 ug/L	0.0432U ug/L 0.0859U ug/L 13.3U ug/L
B18-10066	Cadmium Lead	0.0817 ug/L 0.084 ug/L	0.0817U ug/L 0.084U ug/L
B18-10067	Cadmium Lead Zinc	0.0469 ug/L 0.115 ug/L 18.2 ug/L	0.0469U ug/L 0.115U ug/L 18.2U ug/L
B18-10068	Cadmium Lead Zinc	0.0415 ug/L 0.109 ug/L 8.29 ug/L	0.0415U ug/L 0.109U ug/L 8.29U ug/L
B18-10065F	Lead Tin Zinc	0.0289 ug/L 0.018 ug/L 10.6 ug/L	0.0289U ug/L 0.018U ug/L 10.6U ug/L
B18-10066F	Iron	0.538 ug/L	0.538U ug/L
B18-10067F	Iron Lead	0.533 ug/L 0.0387 ug/L	0.533U ug/L 0.0387U ug/L
B18-10068F	Lead Zinc	0.02 ug/L 8.46 ug/L	0.02U ug/L 8.46U ug/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10065MS/MSD (B18-10065 B18-10066 B18-10067 B18-10068)	Aluminum Antimony	2 (75-125) 10 (75-125)	33 (75-125) 10 (75-125)	J (all detects) J (all detects)	A
B18-10065MS/MSD (B18-10065 B18-10066 B18-10067 B18-10068)	Iron Titanium	51 (75-125) 30 (75-125)	50 (75-125) 62 (75-125)	J (all detects) J (all detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10065MS/MSD (B18-10065 B18-10066 B18-10067 B18-10068)	Aluminum Titanium	177 (≤25) 70 (≤25)	J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10065DUP (B18-10065 B18-10066 B18-10067 B18-10068)	Lead	26 (≤25)	J (all detects)	A
B18-10065FDUP (B18-10065F B18-10066F B18-10067F B18-10068F)	Lead	27 (≤25)	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

No field replicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-001	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

Due to equipment blank contamination, data were qualified as not detected in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-001

Sample	Analyte	Flag	A or P	Reason (Code)
B18-SW-EB B18-10065 B18-10066 B18-10067 B18-10068 B18-SW-EBF B18-10065F B18-10066F B18-10067F B18-10068F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10065 B18-10066 B18-10067 B18-10068	Aluminum Antimony Iron Titanium	J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10065 B18-10066 B18-10067 B18-10068	Aluminum Titanium	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10065 B18-10066 B18-10067 B18-10068 B18-10065F B18-10066F B18-10067F B18-10068F	Lead	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-SW-EB B18-10065 B18-10066 B18-10067 B18-10068 B18-SW-EBF B18-10065F B18-10066F B18-10067F B18-10068F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-001

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-001

Sample	Analyte	Modified Final Concentration	A or P	Code
B18-10065	Cadmium Lead Zinc	0.0432U ug/L 0.0859U ug/L 13.3U ug/L	A	FB
B18-10066	Cadmium Lead	0.0817U ug/L 0.084U ug/L	A	FB
B18-10067	Cadmium Lead Zinc	0.0469U ug/L 0.115U ug/L 18.2U ug/L	A	FB
B18-10068	Cadmium Lead Zinc	0.0415U ug/L 0.109U ug/L 8.29U ug/L	A	FB
B18-10065F	Lead Tin Zinc	0.0289U ug/L 0.018U ug/L 10.6U ug/L	A	FB
B18-10066F	Iron	0.538U ug/L	A	FB
B18-10067F	Iron Lead	0.533U ug/L 0.0387U ug/L	A	FB
B18-10068F	Lead Zinc	0.02U ug/L 8.46U ug/L	A	FB

LDC #: 45386A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-001 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A ~~A~~ SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	SW	EB=1,6
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCSD, SRM1/SRM2
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-SW-EB	56370	Water	07/10/18
2	B18-10065	56371	Water	07/10/18
3	B18-10066	56372	Water	07/10/18
4	B18-10067	56373	Water	07/10/18
5	B18-10068	56374	Water	07/10/18
6	B18-SW-EBF	56370F	Water	07/10/18
7	B18-10065F	56371F	Water	07/10/18
8	B18-10066F	56372F	Water	07/10/18
9	B18-10067F	56373F	Water	07/10/18
10	B18-10068F	56374F	Water	07/10/18
11	B18-10065MS	56371MS	Water	07/10/18
12	B18-10065MSD	56371MSD	Water	07/10/18
13	B18-10065DUP	56371DUP	Water	07/10/18
14	B18-10066MS	56372MS	Water	07/10/18
15	B18-10066MSD	56372MSD	Water	07/10/18

LDC #: 45386A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-001 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: CA
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10066DUP	56372DUP	Water	07/10/18
17	B18-10068MS	56374MS	Water	07/10/18
18	B18-10068MSD	56374MSD	Water	07/10/18
19	B18-10068DUP	56374DUP	Water	07/10/18
20	B18-10065FDUP	56371FDUP	Water	07/10/18
21	B18-10066FDUP	56372FDUP	Water	07/10/18
22	B18-10068FDUP	56374FDUP	Water	07/10/18
23				
24				
25				

Notes:

LDC #: 45386A4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-10		[✓ Al, Sb, As, Ba, Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC:11-13, 20		[✓ Al, Sb, As,] Ba, [✓ Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn,] Hg, [✓ Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___
14-16, 21		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg,] Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
17-19, 22		Al, Sb, As, [✓ Ba,] Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 45386A4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: GT
2nd reviewer: GT

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: H	Det/ND		
~~1-10~~ All	7/10/18	8/24/18	45	J/UJ/P	~~Det~~ ND		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45386A4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: C
2nd Reviewer: CV

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 7/10/18
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: 2-5

FB

Analyte	Blank ID	Sample Identification											
	1	Action Limit	2	3	4	5							
Cd	0.0242	0.121	0.0432	0.0817	0.0469	0.0415							
Cu	0.0762	0.381											
Pb	0.0276	0.138	0.0859	0.084	0.115	0.109							
Mo	0.034	0.17											
Ni	0.0206	0.103											
Sn	0.0303	0.1515											
Zn	3.98	19.9	13.3		18.2	8.29							

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: 7-10

Analyte	Blank ID	Sample Identification											
	6	Action Limit	7	8	9	10							
Sb	0.0125	0.0625											
Cd	0.00412	0.0206											
Cu	0.113	0.565											
Fe	2.75	13.75		0.538	0.533								
Pb	0.0101	0.0505	0.0289		0.0387	0.02							
Sn	0.0191	0.0955	0.018										
Ti	0.0443	0.2215											
Zn	2.12	10.6	10.6			8.46							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 45386A4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of ___
Reviewer: ___
2nd Reviewer: ___

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	11/12		Al	2	33		2-5	J/R/A (Det) LM
			Sb	10	10			J/R/A (Det)
			Fe	51	50			J/UJ/A (Det)
			Ti	30	62			J/UJ/A (Det)
			Al			177		J/UJ/A (Det) HD
			Ti			70		J/UJ/A (Det)

Comments: ___

LDC #: 45386A4c

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? (25)

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

(HD)

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		13		Pb	26		2-5	J (all det)
		20		Pb	27		7-10	J (all det)

Comments: _____

DUP.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-001

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SW-EB	56370	Water	07/10/18
B18-10065	56371	Water	07/10/18
B18-10066	56372	Water	07/10/18
B18-10067	56373	Water	07/10/18
B18-10068	56374	Water	07/10/18
B18-10065MS	56371MS	Water	07/10/18
B18-10065MSD	56371MSD	Water	07/10/18
B18-10065DUP	56371DUP	Water	07/10/18
B18-10066MS	56372MS	Water	07/10/18
B18-10066MSD	56372MSD	Water	07/10/18
B18-10066DUP	56372DUP	Water	07/10/18
B18-10068MS	56374MS	Water	07/10/18
B18-10068MSD	56374MSD	Water	07/10/18
B18-10068DUP	56374DUP	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-SW-EB	Nitrate as N Total orthophosphate as P	58 days 43 days	2 days 2 days	R (all non-detects) R (all non-detects)	P
B18-10065 B18-10066 B18-10067 B18-10068	Nitrate as N Total orthophosphate as P	58 days 43 days	2 days 2 days	J (all detects) J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample B18-SW-EB was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
B18-SW-EB	07/10/18	Dissolved organic carbon	0.167 mg/L	B18-10065 B18-10066 B18-10067 B18-10068

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10066DUP (B18-10065 B18-10066 B18-10067 B18-10068)	Total organic carbon	28 (≤25)	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

No field replicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-001	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in one sample.

Due to technical holding time, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-001

Sample	Analyte	Flag	A or P	Reason (Code)
B18-SW-EB	Nitrate as N Total orthophosphate as P	R (all non-detects) R (all non-detects)	P	Technical holding times (H)
B18-10065 B18-10066 B18-10067 B18-10068	Nitrate as N Total orthophosphate as P	J (all detects) J (all detects)	P	Technical holding times (H)
B18-10065 B18-10066 B18-10067 B18-10068	Total organic carbon	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-SW-EB B18-10065 B18-10066 B18-10067 B18-10068	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-001

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-001

No Sample Data Qualified in this SDG

LDC #: 45386A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-001 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC (SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / ~~A~~SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	SW	EB=1
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SW-EB	56370	Water	07/10/18
2	B18-10065	56371	Water	07/10/18
3	B18-10066	56372	Water	07/10/18
4	B18-10067	56373	Water	07/10/18
5	B18-10068	56374	Water	07/10/18
6	B18-10065MS	56371MS	Water	07/10/18
7	B18-10065MSD	56371MSD	Water	07/10/18
8	B18-10065DUP	56371DUP	Water	07/10/18
9	B18-10066MS	56372MS	Water	07/10/18
10	B18-10066MSD	56372MSD	Water	07/10/18
11	B18-10066DUP	56372DUP	Water	07/10/18
12	B18-10068MS	56374MS	Water	07/10/18
13	B18-10068MSD	56374MSD	Water	07/10/18
14	B18-10068DUP	56374DUP	Water	07/10/18
15				
16				
17				

LDC #: 45386A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-5	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 6-8	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
9-11	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC]
12-14	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ MBAS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CF
2nd reviewer: CF

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1	7/10/18	9/6/18	58	J/R/P (ND)	8/22/18	43	J/R/P (ND)
2-5	7/10/18	9/6/18	58	J/R/P (Det)	8/22/18	43	J/R/P (Det)

LDC #: 45386A6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See Cover
Blank units: mg/L **Associated sample units:** mg/L
Sampling date: 7/10/18
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: 2-5

Analyte	Blank ID	Action Limit	Sample Identification							
	1		No Qualifiers (>5x)							
DOC	0.167	0.835								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 45366A6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		11		TOC	28 (≤25)		2-5	J / UJ / A (DET)

Comments: _____

LDC Report# 45386B2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 10, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-003

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56400	Water	07/12/18
B18-10016	56401	Water	07/12/18
B18-10438 (overdraw)	56402	Water	07/12/18
B18-10020	56403	Water	07/12/18
B18-10073	56404	Water	07/12/18
B18-10074	56405	Water	07/12/18
B18-10075	56406	Water	07/12/18
B18-10017	56407	Water	07/13/18
B18-10019	56408	Water	07/13/18
B18-10069	56409	Water	07/11/18
B18-10070	56410	Water	07/11/18
B18-10071	56411	Water	07/11/18
B18-10072	56412	Water	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

No field replicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-003	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-003

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-003

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-003

No Sample Data Qualified in this SDG

LDC #: 45386B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/9/19
SDG #: 1807003-003 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56400	Water	07/12/18
2	B18-10016	56401	Water	07/12/18
3	B18-10438 (overdraw)	56402	Water	07/12/18
4	B18-10020	56403	Water	07/12/18
5	B18-10073	56404	Water	07/12/18
6	B18-10074	56405	Water	07/12/18
7	B18-10075	56406	Water	07/12/18
8	B18-10017	56407	Water	07/13/18
9	B18-10019	56408	Water	07/13/18
10	B18-10069	56409	Water	07/11/18
11	B18-10070	56410	Water	07/11/18
12	B18-10071	56411	Water	07/11/18
13	B18-10072	56412	Water	07/11/18

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-003

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56400	Water	07/12/18
B18-10016	56401	Water	07/12/18
B18-10438 (overdraw)	56402	Water	07/12/18
B18-10020	56403	Water	07/12/18
B18-10073	56404	Water	07/12/18
B18-10074	56405	Water	07/12/18
B18-10075	56406	Water	07/12/18
B18-10017	56407	Water	07/13/18
B18-10019	56408	Water	07/13/18
B18-10069	56409	Water	07/11/18
B18-10070	56410	Water	07/11/18
B18-10071	56411	Water	07/11/18
B18-10072	56412	Water	07/11/18
B18-10015F	56400F	Water	07/12/18
B18-10016F	56401F	Water	07/12/18
B18-10438 (overdraw)F	56402F	Water	07/12/18
B18-10020F	56403F	Water	07/12/18
B18-10073F	56404F	Water	07/12/18
B18-10074F	56405F	Water	07/12/18
B18-10075F	56406F	Water	07/12/18
B18-10017F	56407F	Water	07/13/18
B18-10019F	56408F	Water	07/13/18
B18-10069F	56409F	Water	07/11/18
B18-10070F	56410F	Water	07/11/18
B18-10071F	56411F	Water	07/11/18
B18-10072F	56412F	Water	07/11/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015MS	56400MS	Water	07/12/18
B18-10015MSD	56400MSD	Water	07/12/18
B18-10015DUP	56400DUP	Water	07/12/18
B18-10074MS	56405MS	Water	07/12/18
B18-10074MSD	56405MSD	Water	07/12/18
B18-10074DUP	56405DUP	Water	07/12/18
B18-10069MS	56409MS	Water	07/11/18
B18-10069MSD	56409MSD	Water	07/11/18
B18-10069DUP	56409DUP	Water	07/11/18
B18-10070MS	56410MS	Water	07/11/18
B18-10070MSD	56410MSD	Water	07/11/18
B18-10070DUP	56410DUP	Water	07/11/18
B18-10072MS	56412MS	Water	07/11/18
B18-10072MSD	56412MSD	Water	07/11/18
B18-10072DUP	56412DUP	Water	07/11/18
B18-10015FDUP	56400FDUP	Water	07/12/18
B18-10074FDUP	56405FDUP	Water	07/12/18
B18-10069FDUP	56409FDUP	Water	07/11/18
B18-10070FDUP	56410FDUP	Water	07/11/18
B18-10072FDUP	56412FDUP	Water	07/11/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10015F B18-10016F B18-10438 (overdraw)F B18-10020F B18-10073F B18-10074F B18-10075F	Mercury	49	28	UJ (all non-detects)	P
B18-10017 B18-10019 B18-10017F B18-10019F	Mercury	48	28	UJ (all non-detects)	P
B18-10069 B18-10070 B18-10071 B18-10072 B18-10069F B18-10070F B18-10071F B18-10072F	Mercury	50	28	UJ (all non-detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10015MS/MSD (B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069)	Aluminum	180 (75-125)	-	J (all detects)	A
B18-10015MS/MSD (B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069)	Antimony Manganese	7 (75-125) -5 (75-125)	7 (75-125) 46 (75-125)	J (all detects) J (all detects)	A
B18-10015MS/MSD (B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069)	Iron Beryllium	35 (75-125) -	50 (75-125) 72 (75-125)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
B18-10070MS/MSD (B18-10070 B18-10071 B18-10072)	Aluminum Iron	126 (75-125) -	- 126 (75-125)	J (all detects) J (all detects)	A
B18-10070MS/MSD (B18-10070 B18-10071 B18-10072)	Antimony	10 (75-125)	10 (75-125)	J (all detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10070MS/MSD (B18-10070 B18-10071 B18-10072)	Beryllium Manganese Titanium	72 (75-125) 59 (75-125) 66 (75-125)	72 (75-125) 71 (75-125) 73 (75-125)	J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10015MS/MSD (B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069)	Aluminum Iron Manganese	53 (≤25) 35 (≤25) 249 (≤25)	J (all detects) J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10015FDUP (B18-10015F B18-10016F B18-10438 (overdraw)F B18-10020F B18-10073F B18-10074F B18-10075F B18-10017F B18-10019F B18-10069F)	Cadmium Lead Nickel Zinc	61 (≤25) 43 (≤25) 37 (≤25) 71 (≤25)	J (all detects) J (all detects) J (all detects) J (all detects)	A
B18-10070FDUP (B18-10070F B18-10071F B18-10072F)	Lead Titanium	60 (≤25) 30 (≤25)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
B18-10072FDUP (B18-10070F B18-10071F B18-10072F)	Barium	29 (≤25)	J (all detects)	A

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10015DUP (B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069)	Copper	29 (≤25)	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

No field replicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-003	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in twenty-six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-003

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072 B18-10015F B18-10016F B18-10438 (overdraw)F B18-10020F B18-10073F B18-10074F B18-10075F B18-10017F B18-10019F B18-10069F B18-10070F B18-10071F B18-10072F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069	Aluminum	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069	Antimony Manganese	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069	Iron Beryllium	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10070 B18-10071 B18-10072	Aluminum Iron	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10070 B18-10071 B18-10072	Antimony	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10070 B18-10071 B18-10072	Beryllium Manganese Titanium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069	Aluminum Iron Manganese	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10015F B18-10016F B18-10438 (overdraw)F B18-10020F B18-10073F B18-10074F B18-10075F B18-10017F B18-10019F B18-10069F	Cadmium Lead Nickel Zinc Copper	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10070F B18-10071F B18-10072F	Lead Titanium Barium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (HD)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072 B18-10015F B18-10016F B18-10438 (overdraw)F B18-10020F B18-10073F B18-10074F B18-10075F B18-10017F B18-10019F B18-10069F B18-10070F B18-10071F B18-10072F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-003

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-003

No Sample Data Qualified in this SDG

LDC #: 45386B4a

SDG #: 1807003-003

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 7/15/19

Page: 1 of 2

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, SRM/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56400	Water	07/12/18
2	B18-10016	56401	Water	07/12/18
3	B18-10438 (overdraw)	56402	Water	07/12/18
4	B18-10020	56403	Water	07/12/18
5	B18-10073	56404	Water	07/12/18
6	B18-10074	56405	Water	07/12/18
7	B18-10075	56406	Water	07/12/18
8	B18-10017	56407	Water	07/13/18
9	B18-10019	56408	Water	07/13/18
10	B18-10069	56409	Water	07/11/18
11	B18-10070	56410	Water	07/11/18
12	B18-10071	56411	Water	07/11/18
13	B18-10072	56412	Water	07/11/18
14	B18-10015F	56400F	Water	07/12/18
15	B18-10016F	56401F	Water	07/12/18

LDC #: 45386B4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-003 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10438 (overdraw)F	56402F	Water	07/12/18
17	B18-10020F	56403F	Water	07/12/18
18	B18-10073F	56404F	Water	07/12/18
19	B18-10074F	56405F	Water	07/12/18
20	B18-10075F	56406F	Water	07/12/18
21	B18-10017F	56407F	Water	07/13/18
22	B18-10019F	56408F	Water	07/13/18
23	B18-10069F	56409F	Water	07/11/18
24	B18-10070F	56410F	Water	07/11/18
25	B18-10071F	56411F	Water	07/11/18
26	B18-10072F	56412F	Water	07/11/18
27	B18-10015MS	56400MS	Water	07/12/18
28	B18-10015MSD	56400MSD	Water	07/12/18
29	B18-10015DUP	56400DUP	Water	07/12/18
30	B18-10074MS	56405MS	Water	07/12/18
31	B18-10074MSD	56405MSD	Water	07/12/18
32	B18-10074DUP	56405DUP	Water	07/12/18
33	B18-10069MS	56409MS	Water	07/11/18
34	B18-10069MSD	56409MSD	Water	07/11/18
35	B18-10069DUP	56409DUP	Water	07/11/18
36	B18-10070MS	56410MS	Water	07/11/18
37	B18-10070MSD	56410MSD	Water	07/11/18
38	B18-10072MS	56412MS	Water	07/11/18
39	B18-10072MSD	56412MSD	Water	07/11/18
40	B18-10072DUP	56412DUP	Water	07/11/18
41	B18-10015DUP F	56400DUP	Water	07/12/18
42	B18-10074DUP F	56405DUP	Water	07/12/18
43	B18-10069DUP F	56409DUP	Water	07/11/18
44	B18-10072DUP F	56412DUP	Water	07/11/18
45	~~#11 DUP~~			
46	~~#24 DUP~~			
47				

Notes:

LDC #: 45386B-6

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-26		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
QC:27-29,41,36,37		[✓ Al, Sb, As], Ba, [✓ Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn], Hg, [✓ Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], __ __
30-32,42		Al, Sb, As, [✓ Ba], Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
33-35,43		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
45,46		[✓ Al, Sb, As], Ba, [✓ Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn], Hg, [✓ Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], __ __
38-40,44		Al, Sb, As, [✓ Ba], Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __

Comments: Mercury by CVAA if performed

LDC #: 45386B4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd reviewer: [illegible]

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code:	Det/ND		
1-7, 14-20	7/12/18	8/30/18	49	J/UJ/P	Det ND		
8, 9, 21, 22	7/13/18	8/30/18	48	J/UJ/P	Det		
10-13, 23-26	7/11/18	8/30/18	50	J/UJ/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45386B4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: C
2nd Reviewer: CL

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	27/28		Al	180			1-10	J det | A (Det) HM
			Sb	7	7			J | R | A LM
			Fe	35	50			J | UJ | A
			Mn	-5	46			J | R | A
			Be		72			J | UJ | A (Det NC)
			Al			53		J | UJ | A Det HD
			Fe			35		
			Mn			249		
	36/37		Al	126			11-13	J det | A (Det) HM
			Sb	10	10			J | R | A LM
			Be	72	72			J | UJ | A (ND)
			Mn	59	71			J | UJ | A (Det)
			Ti	66	73			
			Fe		126			J det | A (Det) HM

Comments:

LDC #: 53866B4a

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: G
2nd Reviewer: Q

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? (25)

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ~~20%~~ samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. HD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		41		Cd	61		14-~~26~~ 23	J (U) J (A) (Det)
				Pb	43			
				Ni	37			
				Zn	71			
		46		Pb	60		24-26	(Det+MD)
				Tl	30			Det)
		44		Ba	29			
		29		Cu	29		~~1~~-~~3~~ 1-10	J (U) J (A) (Det)

Comments: _____

DUP.wpd

LDC Report# 45386B6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-003

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56400	Water	07/12/18
B18-10016	56401	Water	07/12/18
B18-10438 (overdraw)	56402	Water	07/12/18
B18-10020	56403	Water	07/12/18
B18-10073	56404	Water	07/12/18
B18-10074	56405	Water	07/12/18
B18-10075	56406	Water	07/12/18
B18-10017	56407	Water	07/13/18
B18-10019	56408	Water	07/13/18
B18-10069	56409	Water	07/11/18
B18-10070	56410	Water	07/11/18
B18-10071	56411	Water	07/11/18
B18-10072	56412	Water	07/11/18
B18-10015MS	56400MS	Water	07/12/18
B18-10015MSD	56400MSD	Water	07/12/18
B18-10015DUP	56400DUP	Water	07/12/18
B18-10075MS	56406MS	Water	07/12/18
B18-10075MSD	56406MSD	Water	07/12/18
B18-10075DUP	56406DUP	Water	07/12/18
B18-10072MS	56412MS	Water	07/11/18
B18-10072MSD	56412MSD	Water	07/11/18
B18-10072DUP	56412DUP	Water	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10020	Nitrate as N	56 days	2 days	J (all detects)	P
B18-10015 B18-10016 B18-10438 (overdraw) B18-10073 B18-10074 B18-10075	Nitrate as N	56 days	2 days	R (all non-detects)	P
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075	Total orthophosphate as P	41 days	2 days	J (all detects)	P
B18-10017 B18-10019	Nitrate as N	55 days	2 days	R (all non-detects)	P
B18-10017 B18-10019	Total orthophosphate as P	40 days	2 days	J (all detects)	P
B18-10069 B18-10072	Nitrate as N	57 days	2 days	J (all detects)	P
B18-10070 B18-10071	Nitrate as N	57 days	2 days	R (all non-detects)	P
B18-10069 B18-10070 B18-10071 B18-10072	Total orthophosphate as P	42 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

No field replicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-003	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in ten samples.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-003

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10020 B18-10069 B18-10072	Nitrate as N	J (all detects)	P	Technical holding times (H)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10070 B18-10071	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-003

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-003

No Sample Data Qualified in this SDG

LDC #: 45386B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-003 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 9
2nd Reviewer: 9

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56400	Water	07/12/18
2	B18-10016	56401	Water	07/12/18
3	B18-10438 (overdraw)	56402	Water	07/12/18
4	B18-10020	56403	Water	07/12/18
5	B18-10073	56404	Water	07/12/18
6	B18-10074	56405	Water	07/12/18
7	B18-10075	56406	Water	07/12/18
8	B18-10017	56407	Water	07/13/18
9	B18-10019	56408	Water	07/13/18
10	B18-10069	56409	Water	07/11/18
11	B18-10070	56410	Water	07/11/18
12	B18-10071	56411	Water	07/11/18
13	B18-10072	56412	Water	07/11/18
14	B18-10015MS	56400MS	Water	07/12/18
15	B18-10015MSD	56400MSD	Water	07/12/18
16	B18-10015~~DUP~~ DUP	56400DUP	Water	07/12/18
17	B18-10075MS	56406MS	Water	07/12/18

LDC #: 45386B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-003 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

18	B18-10075MSD	56406MSD	Water	07/12/18
19	B18-10075DUP	56406DUP	Water	07/12/18
20	B18-10072MS	56412MS	Water	07/11/18
21	B18-10072MSD	56412MSD	Water	07/11/18
22	B18-10072DUP	56412DUP	Water	07/11/18
23				
24				
25				

Notes:

LDC #: 45386B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-13	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC.14-16	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC]
17-19	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
20-22	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386B6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: G
2nd reviewer: GK

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-7	7/12/18	9/6/18	56	J/R/P (ND=1-3, 5-7)	8/22/18	41	J/R/P (Det)
8, 9	7/13/18	9/6/18	55	J/R/P (ND)	8/22/18	40	J/R/P (Det)
10-13	7/11/18	9/6/18	57	J/R/P (ND=11, 12)	8/22/18	42	J/R/P (Det)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 10, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-005

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56500	Water	07/16/18
B18-10030	56501	Water	07/16/18
B18-10078	56502	Water	07/16/18
B18-10079	56503	Water	07/16/18
B18-10117	56504	Water	07/16/18
B18-10080	56505	Water	07/17/18
B18-10081	56506	Water	07/17/18
B18-10082	56507	Water	07/17/18
B18-10083	56508	Water	07/17/18
B18-10084	56509	Water	07/17/18
B18-10023MS	56500MS	Water	07/16/18
B18-10023MSD	56500MSD	Water	07/16/18
B18-10023DUP	56500DUP	Water	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	Naphthalene	40 (50-150)	-	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	1-Methylnaphthalene Naphthalene	36 (≤25) 55 (≤25)	NA	-
B18-10023MS/MSD (B18-10023)	2-Methylnaphthalene	38 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

No field replicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-005	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and RPD and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-005

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023	Naphthalene	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023	2-Methylnaphthalene	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-005

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-005

No Sample Data Qualified in this SDG

LDC #: 45386C2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/9/19
SDG #: 1807003-005 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	N/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56500	Water	07/16/18
2	B18-10030	56501	Water	07/16/18
3	B18-10078	56502	Water	07/16/18
4	B18-10079	56503	Water	07/16/18
5	B18-10117	56504	Water	07/16/18
6	B18-10080	56505	Water	07/17/18
7	B18-10081	56506	Water	07/17/18
8	B18-10082	56507	Water	07/17/18
9	B18-10083	56508	Water	07/17/18
10	B18-10084	56509	Water	07/17/18
11	B18-10023MS	56500MS	Water	07/16/18
12	B18-10023MSD	56500MSD	Water	07/16/18
13	B18-10023DUP	56500DUP	Water	07/16/18

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45386C26

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Q
2nd Reviewer: ________

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A — Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A — Was a MS/MSD analyzed every 20 samples of each matrix?

Y ~~N~~ (N)/A — Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	11/12	S	40 (50-150)	( )	( )	1 (ND)	J/UJ/A (LM)
		TTT	( )	( )	36 (≤25)	↓	J dets/A (HD)
		S	( )	( )	55 (↓)	↓	↓
		W	( )	( )	38 (↓)	(dets)	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-005

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56500	Water	07/16/18
B18-10030	56501	Water	07/16/18
B18-10078	56502	Water	07/16/18
B18-10079	56503	Water	07/16/18
B18-10117	56504	Water	07/16/18
B18-10080	56505	Water	07/17/18
B18-10081	56506	Water	07/17/18
B18-10082	56507	Water	07/17/18
B18-10083	56508	Water	07/17/18
B18-10084	56509	Water	07/17/18
B18-10023F	56500F	Water	07/16/18
B18-10030F	56501F	Water	07/16/18
B18-10078F	56502F	Water	07/16/18
B18-10079F	56503F	Water	07/16/18
B18-10117F	56504F	Water	07/16/18
B18-10080F	56505F	Water	07/17/18
B18-10081F	56506F	Water	07/17/18
B18-10082F	56507F	Water	07/17/18
B18-10083F	56508F	Water	07/17/18
B18-10084F	56509F	Water	07/17/18
B18-10023MS	56500MS	Water	07/16/18
B18-10023MSD	56500MSD	Water	07/16/18
B18-10023DUP	56500DUP	Water	07/16/18
B18-10084MS	56509MS	Water	07/17/18
B18-10084MSD	56509MSD	Water	07/17/18
B18-10084DUP	56509DUP	Water	07/17/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023FDUP	56500FDUP	Water	07/16/18
B18-10084FDUP	56509FDUP	Water	07/17/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10023F B18-10030F B18-10078F B18-10079F B18-10117F	Mercury	45	28	UJ (all non-detects)	P
B18-10080 B18-10081 B18-10082 B18-10083 B18-10084 B18-10080F B18-10081F B18-10082F B18-10083F B18-10084F	Mercury	44	28	UJ (all non-detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Aluminum	131 (75-125)	-	J (all detects)	A
B18-10023MS/MSD (B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Antimony	14 (75-125)	13 (75-125)	J (all detects) J (all detects)	A
B18-10023MS/MSD (B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Beryllium Titanium	65 (75-125) 65 (75-125)	63 (75-125) -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10023FDUP (B18-10023F B18-10030F B18-10078F B18-10079F B18-10117F B18-10080F B18-10081F B18-10082F B18-10083F B18-10084F)	Copper Zinc	88 (≤25) 56 (≤25)	J (all detects) J (all detects)	A
B18-10023DUP (B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Titanium	66 (≤25)	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

No field replicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-005	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in twenty samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-005

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084 B18-10023F B18-10030F B18-10078F B18-10079F B18-10117F B18-10080F B18-10081F B18-10082F B18-10083F B18-10084F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Aluminum	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Antimony	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Beryllium Titanium	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10023F B18-10030F B18-10078F B18-10079F B18-10117F B18-10080F B18-10081F B18-10082F B18-10083F B18-10084F	Copper Zinc	J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Titanium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084 B18-10023F B18-10030F B18-10078F B18-10079F B18-10117F B18-10080F B18-10081F B18-10082F B18-10083F B18-10084F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-005

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-005

No Sample Data Qualified in this SDG

LDC #: 45386C4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-005 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: C
2nd Reviewer: CF

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, SRM/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56500	Water	07/16/18
2	B18-10030	56501	Water	07/16/18
3	B18-10078	56502	Water	07/16/18
4	B18-10079	56503	Water	07/16/18
5	B18-10117	56504	Water	07/16/18
6	B18-10080	56505	Water	07/17/18
7	B18-10081	56506	Water	07/17/18
8	B18-10082	56507	Water	07/17/18
9	B18-10083	56508	Water	07/17/18
10	B18-10084	56509	Water	07/17/18
11	B18-10023F	56500F	Water	07/16/18
12	B18-10030F	56501F	Water	07/16/18
13	B18-10078F	56502F	Water	07/16/18
14	B18-10079F	56503F	Water	07/16/18
15	B18-10117F	56504F	Water	07/16/18

LDC #: 45386C4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-005 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10080F	56505F	Water	07/17/18
17	B18-10081F	56506F	Water	07/17/18
18	B18-10082F	56507F	Water	07/17/18
19	B18-10083F	56508F	Water	07/17/18
20	B18-10084F	56509F	Water	07/17/18
21	B18-10023MS	56500MS	Water	07/16/18
22	B18-10023MSD	56500MSD	Water	07/16/18
23	B18-10023DUP	56500DUP	Water	07/16/18
24	B18-10084MS	56509MS	Water	07/17/18
25	B18-10084MSD	56509MSD	Water	07/17/18
26	B18-10084FDUP	56509FDUP	Water	07/17/18
27	B18-10023FDUP	56500FDUP	Water	07/16/18
28	B18-10084FDUP	56509FDUP	Water	07/17/18
29				
30				
31				

Notes:

LDC #: US366C4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-20		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
QC: 21-23,27		[✓ Al, Sb, As], Ba, [✓ Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn], [✓ Hg], [✓ Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], ___ ___
24-26, 28		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45386C4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: GV
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: H	Det/ND		
1-5, 11-15	7/16/18	8/30/18	45	J/UJ/P	ND		
6-10, 16-20	7/17/18	8/30/18	44	J/UJ/P	ND		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45386C4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: G
2nd Reviewer: G

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications	
	21/22		Al	131			1-10	Jdet/A	(Det) HM
			Sb	14	13			J/R/A	↓ LM
			Be	65	63			J/UJ/A	Det/ND
			Ti	65				J/UJ/A	Det ↓

Comments:

LDC #: 45366C4a

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? 2S

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		27		Cu	88		11-20	J (all detects)
				Zn	56			↓
		23		Ti	66		1-10	J (all detects)

Comments: _____

DUP.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-005

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56500	Water	07/16/18
B18-10030	56501	Water	07/16/18
B18-10078	56502	Water	07/16/18
B18-10079	56503	Water	07/16/18
B18-10117	56504	Water	07/16/18
B18-10080	56505	Water	07/17/18
B18-10081	56506	Water	07/17/18
B18-10082	56507	Water	07/17/18
B18-10083	56508	Water	07/17/18
B18-10084	56509	Water	07/17/18
B18-10023MS	56500MS	Water	07/16/18
B18-10023MSD	56500MSD	Water	07/16/18
B18-10023DUP	56500DUP	Water	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117	Nitrate as N	56 days	2 days	R (all non-detects)	P
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117	Total orthophosphate as P	38 days	2 days	J (all detects)	P
B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Nitrate as N	55 days	2 days	R (all non-detects)	P
B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Total orthophosphate as P	37 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10023DUP (All samples in SDG 1807003-005)	Total suspended solids	46 (≤25)	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

No field replicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-005	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in ten samples.

Due to technical holding time, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-005

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Total suspended solids	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-005

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-005

No Sample Data Qualified in this SDG

LDC #: 45386C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19

SDG #: 1807003-005 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56500	Water	07/16/18
2	B18-10030	56501	Water	07/16/18
3	B18-10078	56502	Water	07/16/18
4	B18-10079	56503	Water	07/16/18
5	B18-10117	56504	Water	07/16/18
6	B18-10080	56505	Water	07/17/18
7	B18-10081	56506	Water	07/17/18
8	B18-10082	56507	Water	07/17/18
9	B18-10083	56508	Water	07/17/18
10	B18-10084	56509	Water	07/17/18
11	B18-10023MS	56500MS	Water	07/16/18
12	B18-10023MSD	56500MSD	Water	07/16/18
13	B18-10023DUP	56500DUP	Water	07/16/18
14				

Notes:

LDC #: 45386C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-10	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 11-13	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ O&G]
13	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ TSS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386C6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-5	7/16/18	9/10/18	56	J/R/P (ND)	8/23/18	38	J/R/P (Det)
6-10	7/17/18	9/10/18	55	J/R/P (ND)	8/23/18	37	J/R/P (Det)

LDC #: 45366C6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: CQ
2nd Reviewer: CQ

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? (25)

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. HD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		13		TSS	46 (≤25)		All	J/UJ/AC (Det)

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 11, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II & IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-007

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022**	56561**	Water	07/18/18
B18-10076**	56562**	Water	07/18/18
B18-10077**	56563**	Water	07/18/18
B18-10112	56564	Water	07/18/18
B18-10113**	56565**	Water	07/18/18
B18-10024**	56566**	Water	07/19/18
B18-10029	56567	Water	07/19/18
B18-10114**	56568**	Water	07/19/18
B18-10115**	56569**	Water	07/19/18
B18-10116**	56570**	Water	07/19/18
B18-20116	56571	Water	07/19/18
B18-10031	56572	Water	07/20/19
B18-10032	56573	Water	07/20/19
B18-10119	56574	Water	07/20/19
B18-10121	56575	Water	07/20/19
B18-10123	56576	Water	07/20/19
B18-10178	56577	Water	07/20/19
B18-10076MS	56562MS	Water	07/18/18
B18-10076MSD	56562MSD	Water	07/18/18
B18-10076DUP	56562DUP	Water	07/18/18

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Date	Compound	r^2	Associated Samples	Flag	A or P
08/06/18	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene Acenaphthene	0.9816 0.9860 0.9853 0.9888 0.9891	B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116**	J (all detects) UJ (all non-detects)	A

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/07/18	Naphthalene	36	B18-10022**	J (all detects)	A
	2-Methylnaphthalene	30	B18-10076**	UJ (all non-detects)	
	1-Methylnaphthalene	34	B18-10077**		
	Biphenyl	28	B18-10113**		
	2,6-Dimethylnaphthalene	27	B18-10024**		
	Acenaphthylene	34	B18-10114**		
	Acenaphthene	38	B18-10115**		
	Fluorene	35	B18-10116**		
	Dibenzothiophene	34			
	Phenanthrene	37			
	Anthracene	42			
	1-Methylphenanthrene	31			
	Fluoranthene	31			
	Pyrene	25			
	Benzo(a)anthracene	29			
	Chrysene	29			
	Benzo(g,h,i)perylene	24			

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/08/18	Fluoranthene	23	B18-10022**	J (all detects)	A
	Pyrene	26	B18-10076**	UJ (all non-detects)	
	Benzo(b)fluoranthene	38	B18-10077**		
	Indeno(1,2,3-cd)pyrene	41	B18-10113**		
	Dibenzo(a,h)anthracene	37	B18-10024**		
			B18-10114**		
			B18-10115**		
			B18-10116**		

All of the continuing calibration relative response factors (RRF) were within validation criteria.

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	Benzo(b)fluoranthene	31 (≤25)	J (all detects)	A

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10116** and B18-20116 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/L)		RPD
	B18-10116**	B18-20116	
Benzo(b)fluoranthene	1.82	2.36	26
Fluoranthene	3.12	3.06	2
Pyrene	1.96	2.04	4
Acenaphthylene	5U	1.22	Not calculable

XI. Internal Standards

All internal standard areas and retention times were within QC limits for samples which underwent Level IV validation with the following exceptions:

Sample	Internal Standards	Area (Limits)	Affected Compound	Flag	A or P
B18-10114**	d10-Anthracene	2708837 (4818849-8949291)	Fluoranthene Pyrene	J (all detects)	P
B18-10114**	d10-Anthracene	2708837 (4818849-8949291)	Naphthalene 2-Methylnaphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 2,3,5-Trimethylnaphthalene Dibenzothiophene Biphenyl 1-Methylphenanthrene	NA	-
B18-10076**	d12-Benzo(a)pyrene	4666325 (1075347-4301390)	Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Benzo(e)pyrene Perylene	J (all detects) UJ (all non-detects)	A

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-007	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level II validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, continuing calibration %D, DUP RPD, internal standard area, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-007

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116**	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene Acenaphthene	J (all detects) UJ (all non-detects)	A	Initial calibration (r^2) (BC)
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116**	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl 2,6-Dimethylnaphthalene Acenaphthylene Acenaphthene Fluorene Dibenzothiophene Phenanthrene Anthracene 1-Methylphenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Initial calibration verification (%D) (HV)
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116**	Fluoranthene Pyrene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (CH)
B18-10076	Benzo(b)fluoranthene	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10114**	Fluoranthene Pyrene	J (all detects)	P	Internal standards (area) (*XI)
B18-10076**	Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Benzo(e)pyrene Perylene	J (all detects) UJ (all non-detects)	A	Internal standards (area) (*XI)

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-007

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-007

No Sample Data Qualified in this SDG

LDC #: 45386D2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/10/19
SDG #: 1807003-007 Level II/IV Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 9
2nd Reviewer: 1

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	Not reviewed for Level II validation
III.	Initial calibration/ICV	A/SW	Not reviewed for Level II validation r^2, ICV ≤ 20%
IV.	Continuing calibration	SW	Not reviewed for Level II validation CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates (Bup)	A/SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D=10+11
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level II validation
XIII.	Target compound identification	A	Not reviewed for Level II validation
XIV.	System performance	A	Not reviewed for Level II validation
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
**Indicates samples underwent Level IV review

	Client ID	Lab ID	Matrix	Date
1	B18-10022**	56561**	Water	07/18/18
2	B18-10076**	56562**	Water	07/18/18
3	B18-10077**	56563**	Water	07/18/18
4	B18-10112	56564	Water	07/18/18
5	B18-10113**	56565**	Water	07/18/18
6	B18-10024**	56566**	Water	07/19/18
7	B18-10029	56567	Water	07/19/18
8	B18-10114**	56568**	Water	07/19/18
9	B18-10115**	56569**	Water	07/19/18
10	B18-10116**	56570**	Water	07/19/18
11	B18-20116	56571	Water	07/19/18
12	B18-10031	56572	Water	07/20/19
13	B18-10032	56573	Water	07/20/19

LDC #: 45386D2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/10/19
SDG #: 1807003-007 Level II/IV Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

14	B18-10119	56574	Water	07/20/19
15	B18-10121	56575	Water	07/20/19
16	B18-10123	56576	Water	07/20/19
17	B18-10178	56577	Water	07/20/19
18	B18-10076MS	56562MS	Water	07/18/18
19	B18-10076MSD	56562MSD	Water	07/18/18
20	B18-10076DUP	56562DUP	Water	07/18/18
21				
22				
23				

Notes:

LDC #: 45386D2b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: 9

Method: Semivolatiles (EPA Method 625)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	✓			
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 35%? . $r^2 \geq 0.99$?		✓		
IIIa. Initial Calibration Verification calibration				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?	✓			
Were all percent differences (%D) of continuing calibration ≤ 20%?		✓		
V.Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed with each analysis batch?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓	✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 45386b2b

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) within 70-130%?	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?		✓		
Were retention times within +/-30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

d10 - VV O - d12 - III

LDC #: 45386-36

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer:
2nd Reviewer: R

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
(Y) N N/A Were all percent relative standard deviations (%RSD) ≤ ~~15~~ 35 and relative response factors (RRF) within method criteria?
Y N N/A Was a curve fit used for evaluation?
Y (N) N/A Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤15.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	8/6/18	ICAL	S	r^2=0.9816		1-3, 5-6, 8-10, MB (ND)	✓/M1/A (BC)
			W	=0.9860			
			TTT	=0.9853			
			XXX	=0.9888			
			~~YY~~	=0.9891			

LDC #: ~~45386~~ 6b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA ~~SW-846~~ Method ~~8270D)~~ 625)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y (N) N/A Were all %D within the validation criteria of ≤~~30 %D ?~~ 20% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤30.0%)~~ 20%)	Associated Samples	Qualifications (HV)
	8/7/18	PAH CV	S	26	~~All~~ (lab + NB)	J (HV) A (~~all~~)
			W	30	1-3, 5-6, 8-10, MB	
			TTT	34		
			EEEE	28		
			XXX	27		
			DD	34		
			~~FF~~	38		
			NN	35		
			~~AAAA~~	~~35~~ 34		
			UU	37		
			VV	45		
			HHHH	31		
			YY	31		
			ZZ	25		
			CCC	29		
			DDD	29		
			LLL	24		

LDC #: 45386D-b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA ~~SW 846~~ Method ~~8270D~~) 625

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	8/8/18	PAHccV	YY	23		1-3.5-6, 8-10.MB (dets + ND)	Y/N/A (=H)
			22	26			
			~~FFF~~	38			
			NN	41			
			~~KK~~	37			

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LDC #: 45386D3b

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	20	GGG	( )	( )	31 (≤ 25)	2 (dets)	J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#45386D2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/L)		RPD
	10	11	
GGG	1.82	2.36	26
YY	3.12	3.06	2
ZZ	1.96	2.04	4
DD	5U	1.22	NC

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2019\45386D2b_RHMP.wpd

LDC #: 46386 B-b

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: R

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all internal standard area counts within ~~-50~~ -58 to ~~+100~~ +136 of the associated calibration standard?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications (*#)
		8 (dots+ND)	d10- VV	2708837 (4818849-8949291)		dots/P *
		(XY, ZZ-dots)				
		~~20 (Lab dup)~~	~~d10-111~~	~~5435767 (1749170-3248458)~~		Q
		2 (dots+ND)	d10-111	4666335 (1075247-4301390)		V/UV A *
		20 (Lab dup)	d12-111	5435767 ( )		No Cmail
			d12-LLL	3958406 (970036- 3880144)		V
						* see cpd list

(DCB) = 1,4-Dichlorobenzene-d4
(NPT) = Naphthalene-d8
(ANT) = Acenaphthene-d10
(PHN) = Phenanthrene-d10
(CRY) = Chrysene-d12
(PRY) = Perylene-d12

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Method: GC/MS (EPA Method 625)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
8/6/2018	Fluoranthene	1	50	0.0179006000
		2	100	0.0401597000
		3	250	0.1200643000
		4	500	0.2636598000
		5	1000	0.5716119000

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.00055726*	0.00055726
Correlation Coefficient	*0.998615*	0.99449
Coefficient of Determination (r^2)	*0.997232*	

Method: GC/MS (EPA Method 625)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
8/6/2018	Benzo(a)pyrene	1	50	0.040952200
		2	100	0.074028400
		3	250	0.184882600
		4	500	0.369202200
		5	1000	0.652374000

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.00067370*	0.000674
Correlation Coefficient	*0.998449*	0.99264
Coefficient of Determination (r^2)	*0.996901*	

Method: GC/MS (EPA Method 625)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
8/6/2018	Benzo(g,h,i)perylene	1	50	0.0316482
		2	100	0.0626504
		3	250	0.1563291
		4	500	0.333455600
		5	1000	0.609684000

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.00062139*	0.000621
Correlation Coefficient	*0.999359*	0.99711
Coefficient of Determination (r^2)	*0.998718*	

LDC #: 46386D-b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: D
2nd Reviewer: R

METHOD: GC/MS Semivolatiles (EPA Method 625.1)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	PAH-CCV	8/8/18	~~Phen~~ol (1st internal standard) YY	500	612.5605	612.560	23	22.5
			~~Naphthalen~~e (2nd internal standard) 111	↓	AT2.557T	AT2.339	5	5.5
			~~Pentachl~~orophenol (3rd internal standard) LLL	↓	A93.1696	A93.169T	1	1.4
			Pyrene (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Indeno(1,2,3-cd)pyrene (6th internal standard)~~					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Pentachlorophenol (3rd internal standard)					
			Pyrene (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Indeno(1,2,3-cd)pyrene (6th internal standard)~~					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Pentachlorophenol (3rd internal standard)					
			Pyrene (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Indeno(1,2,3-cd)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45386D36

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: h

METHOD: GC/MS Semivolatiles (EPA Method 625.1)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
d10-GG	10000	690.30	69	69	
d10-UU		986.42	99	99	
d12-DDD		763.42	76	76	
d12-ZZZ		803.53	80	80	
d8-S		463.89	46	46	

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d6					
2-Fluorophenol					
2,4,6-Tribromophenol					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d6					
2-Fluorophenol					
2,4,6-Tribromophenol					

LDC #: 45385b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 2

METHOD: GC/MS Semivolatiles (EPA Method 625.1)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 18/19

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Acenaphthene	562	568	ND	464	419	83	83	74	74	11	10
Pyrene	V	V	2.51	587	613	104	104	107	107	3	4

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45586D3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

METHOD: GC/MS Semivolatiles (EPA Method 625.1)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 56559-BS1/-BS2

Compound	Spike Added (µg/L)		Spike Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Acenaphthene	500	500	425	447	85	85	89	89	5	5
Pyrene	↓	↓	449	418	90	90	84	84	7	7

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45386D-6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: 4

METHOD: GC/MS Semivolatiles (EPA Method 625.1)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2, YY:

Conc. = $\frac{(60 \times 5)(0.574)(\quad)(\quad)(\quad)}{(566824)(0.000557 \times 2)(\quad)}$

= 4.735 ng/L

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration ( )	Qualification
	2	YY	4.74		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II & IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-007

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022**	56561**	Water	07/18/18
B18-10076**	56562**	Water	07/18/18
B18-10077**	56563**	Water	07/18/18
B18-10112	56564	Water	07/18/18
B18-10113**	56565**	Water	07/18/18
B18-10024**	56566**	Water	07/19/18
B18-10029	56567	Water	07/19/18
B18-10114**	56568**	Water	07/19/18
B18-10115**	56569**	Water	07/19/18
B18-10116**	56570**	Water	07/19/18
B18-20116	56571	Water	07/19/18
B18-10031	56572	Water	07/20/19
B18-10032	56573	Water	07/20/19
B18-10119	56574	Water	07/20/19
B18-10121	56575	Water	07/20/19
B18-10123	56576	Water	07/20/19
B18-10178	56577	Water	07/20/19
B18-10022F**	56561F**	Water	07/18/18
B18-10076F**	56562F**	Water	07/18/18
B18-10077F**	56563F**	Water	07/18/18
B18-10112F	56564F	Water	07/18/18
B18-10113F**	56565F**	Water	07/18/18
B18-10024F**	56566F**	Water	07/19/18
B18-10029F	56567F	Water	07/19/18
B18-10114F**	56568F**	Water	07/19/18
B18-10115F**	56569F**	Water	07/19/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10116F**	56570F**	Water	07/19/18
B18-20116F	56571F	Water	07/19/18
B18-10031F	56572F	Water	07/20/19
B18-10032F	56573F	Water	07/20/19
B18-10119F	56574F	Water	07/20/19
B18-10121F	56575F	Water	07/20/19
B18-10123F	56576F	Water	07/20/19
B18-10178F	56577F	Water	07/20/19
B18-10076MS	56562MS	Water	07/18/18
B18-10076MSD	56562MSD	Water	07/18/18
B18-10076DUP	56562DUP	Water	07/18/18
B18-10116MS	56570MS	Water	07/19/18
B18-10116MSD	56570MSD	Water	07/19/18
B18-10116DUP	56570DUP	Water	07/19/18
B18-20116MS	56571MS	Water	07/19/18
B18-20116MSD	56571MSD	Water	07/19/18
B18-20116DUP	56571DUP	Water	07/19/18
B18-10178MS	56577MS	Water	07/20/19
B18-10178MSD	56577MSD	Water	07/20/19
B18-10178DUP	56577DUP	Water	07/20/19
B18-10076FDUP	56562FDUP	Water	07/18/18
B18-10116FDUP	56570FDUP	Water	07/19/18
B18-20116FMS	56571FMS	Water	07/19/18
B18-20116FMSD	56571FMSD	Water	07/19/18
B18-20116FDUP	56571FDUP	Water	07/19/18
B18-10178FDUP	56577FDUP	Water	07/20/19

Samples appended with "F" were analyzed for dissolved metals
**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F**	Mercury	45	28	UJ (all non-detects)	P
B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F** B18-20116F	Mercury	44	28	UJ (all non-detects)	P
B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178 B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F	Mercury	43	28	UJ (all non-detects)	P

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods with the following exceptions:

Sample	Analyte	Finding	Criteria
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	All analytes except Mercury	More than ten samples were run between CCVs.	No more than ten samples to be run between CCVs.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
10/15/19	ICV (19:02)	Selenium	110.8 (90-110)	B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	J (all detects)	P
10/15/19	CCV (23:43)	Selenium	118.2 (90-110)	B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	J (all detects)	P

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
10/15/19	CCV (18:23)	Beryllium	85.9 (90-110)	B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	J (all detects) UJ (all non-detects)	P

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods with the following exceptions:

Sample	Analyte	Finding	Criteria
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	All analytes	No closing CCB associated with these samples.	Closing CCB required for all samples.

No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**)	Antimony	11 (75-125)	11 (75-125)	J (all detects)	A
B18-10076MS/MSD (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**)	Iron	130 (75-125)	155 (75-125)	J (all detects)	A
B18-10076MS/MSD (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**)	Titanium	44 (75-125)	44 (75-125)	J (all detects)	A
B18-20116FMS/MSD (B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F)	Antimony	10 (75-125)	10 (75-125)	J (all detects)	A
B18-20116FMS/MSD (B18-10178F)	Iron	690 (75-125)	630 (75-125)	J (all detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-20116FMS/MSD (B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F)	Iron	690 (75-125)	630 (75-125)	NA	-
B18-20116MS/MSD (B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178)	Beryllium Silver	73 (75-125) 74 (75-125)	71 (75-125) -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
B18-20116MS/MSD (B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178)	Titanium	155 (75-125)	-	J (all detects)	A

For B18-10076MS/MSD and B18-10116MS/MSD, no data were qualified for aluminum percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-20116MS/MSD (B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178)	Aluminum Titanium	67 (≤25) 37 (≤25)	J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10076DUP (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**)	Cadmium Selenium	67 (≤25) -	- 0.019 ug/L (≤0.015)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
B18-20116DUP (B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178)	Zinc	38 (≤25)	-	J (all detects)	A
B18-10076FDUP (B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F**)	Cadmium Lead	31 (≤25) 52 (≤25)	- -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
B18-20116FDUP (B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F)	Titanium	44 (≤25)	-	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56560-LCS1/2 (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F**)	Zinc	121 (72-116)	-	J (all detects)	P
57249-LCS1/2 (B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178 B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F)	Silver	-	56 (61-113)	UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
56560-LCS1/2 (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F**)	Zinc Titanium	33 (≤30) 35 (≤30)	J (all detects) J (all detects)	P

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

Samples B18-10116** and B18-20116 and samples B18-10116F** and B18-20116F were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	B18-10116**	B18-20116	
Aluminum	216	246	13
Antimony	0.115	0.102	12
Arsenic	1.27	1.51	17
Barium	8.1	7.71	5
Beryllium	0.005U	0.0154	Not calculable
Cadmium	0.0274	0.0521	62
Chromium	0.261	0.521	66
Cobalt	0.0971	0.115	17

Analyte	Concentration (ug/L)		RPD
	B18-10116**	B18-20116	
Copper	1.96	3.01	42
Iron	128	112	13
Lead	0.285	0.378	28
Manganese	8.27	8.4	2
Molybdenum	8.84	7.27	19
Nickel	0.432	0.473	9
Selenium	0.0201	0.012	50
Thallium	0.009	0.00847	6
Tin	0.00692	0.0102	38
Titanium	22	33.6	42
Vanadium	2.63	2.96	12
Zinc	6.22	5.71	9

Analyte	Concentration (ug/L)		RPD
	B18-10116F**	B18-20116F	
Antimony	0.14	0.169	19
Arsenic	1.33	1.5	12
Barium	9.14	8.82	4
Beryllium	0.00549	0.005U	Not calculable
Cadmium	0.0281	0.049	54
Chromium	0.0531	0.104	65
Cobalt	0.0451	0.052	14
Copper	1.56	2.42	43

Analyte	Concentration (ug/L)		RPD
	B18-10116F**	B18-20116F	
Lead	0.0025U	0.0388	Not calculable
Manganese	3.47	3.65	5
Molybdenum	9.6	8.58	11
Nickel	0.375	0.436	15
Selenium	0.0225	0.0188	Not calculable
Thallium	0.00736	0.00804	9
Tin	0.005U	0.00902	Not calculable
Titanium	22	18	20
Vanadium	2.3	2.54	10
Zinc	4.28	6.01	34

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation with the following exceptions:

Sample	Internal Standard	%R (Limits)	Affected Analyte	Flag	A or P
B18-10024**	Rhodium (Tune 1)	0.1 (60-125)	Selenium	J (all detects)	P
B18-10024**	Rhodium (Tune 2)	59.3 (60-125)	Iron Nickel Copper Molybdenum Cadmium Tin Antimony	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation.

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-007	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, ICV and CCV %R, MS/MSD %R and RPD, DUP RPD and difference, LCS/LCSD %R and RPD, internal standard %R, and results reported below the RL and above the MDL, data were qualified as estimated in thirty-four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-007

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178 B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F** B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	Selenium	J (all detects)	P	Instrument calibration (ICV %R) (HV)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	Selenium	J (all detects)	P	Instrument calibration (CCV %R) (CH)
B18-10022** B18-10076** B18-10077** B18-10113** B18-10024** B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10113F** B18-10024F** B18-10114F** B18-10115F** B18-10116F**	Beryllium	J (all detects) UJ (all non-detects)	P	Instrument calibration (CCV %R) (LC)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**	Antimony Titanium	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-10178F	Iron	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F	Antimony	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Beryllium Silver	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Titanium	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Aluminum Titanium	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**	Cadmium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116**	Selenium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference) (HD)
B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Zinc	J (all detects)	A	Duplicate sample analysis (RPD) (HD)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F**	Cadmium Lead	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (HD)
B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F	Titanium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
56560-LCS1/2 (B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F**)	Zinc	J (all detects)	P	Laboratory control samples (%R) (HP)
B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178 B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F	Silver	UJ (all non-detects)	P	Laboratory control samples (%R) (LP)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F**	Zinc Titanium	J (all detects) J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10024**	Selenium Iron Nickel Copper Molybdenum Cadmium Tin Antimony	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Internal standards (%R) (*XII)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178 B18-10022F** B18-10076F** B18-10077F** B18-10112F B18-10113F** B18-10024F** B18-10029F B18-10114F** B18-10115F** B18-10116F** B18-20116F B18-10031F B18-10032F B18-10119F B18-10121F B18-10123F B18-10178F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-007

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-007

No Sample Data Qualified in this SDG

LDC #: 45386D4a

SDG #: 1807003-007

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II/IV

Date: 7/15/19

Page: 1 of 23

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	A	Not reviewed for Level II validation
III.	Instrument Calibration	SW	Not reviewed for Level II validation
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not reviewed for Level II validation
V.	Laboratory Blanks	SW	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A/SW	LCS/D, SRM/D
XI.	Field Duplicates	SW	(10,11) (27,28)
XII.	Internal Standard (ICP-MS)	SW	Not reviewed for Level II validation
XIII.	Sample Result Verification	A	Not reviewed for Level II validation
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

**Indicates samples underwent Level IV review / Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10022**	56561**	Water	07/18/18
2	B18-10076**	56562**	Water	07/18/18
3	B18-10077**	56563**	Water	07/18/18
4	B18-10112	56564	Water	07/18/18
5	B18-10113**	56565**	Water	07/18/18
6	B18-10024**	56566**	Water	07/19/18
7	B18-10029	56567	Water	07/19/18
8	B18-10114**	56568**	Water	07/19/18
9	B18-10115**	56569**	Water	07/19/18
10	B18-10116**	56570**	Water	07/19/18
11	B18-20116	56571	Water	07/19/18
12	B18-10031	56572	Water	07/20/19
13	B18-10032	56573	Water	07/20/19
14	B18-10119	56574	Water	07/20/19
15	B18-10121	56575	Water	07/20/19

LDC #: 45386D4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-007 Level II/IV Page: 2 of 23
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10123	56576	Water	07/20/19
17	B18-10178	56577	Water	07/20/19
18	B18-10022F**	56561F**	Water	07/18/18
19	B18-10076F**	56562F**	Water	07/18/18
20	B18-10077F**	56563F**	Water	07/18/18
21	B18-10112F	56564F	Water	07/18/18
22	B18-10113F**	56565F**	Water	07/18/18
23	B18-10024F**	56566F**	Water	07/19/18
24	B18-10029F	56567F	Water	07/19/18
25	B18-10114F**	56568F**	Water	07/19/18
26	B18-10115F**	56569F**	Water	07/19/18
27	B18-10116F**	56570F**	Water	07/19/18
28	B18-20116F	56571F	Water	07/19/18
29	B18-10031F	56572F	Water	07/20/19
30	B18-10032F	56573F	Water	07/20/19
31	B18-10119F	56574F	Water	07/20/19
32	B18-10121F	56575F	Water	07/20/19
33	B18-10123F	56576F	Water	07/20/19
34	B18-10178F	56577F	Water	07/20/19
35	B18-10076MS	56562MS	Water	07/18/18
36	B18-10076MSD	56562MSD	Water	07/18/18
37	B18-10076DUP	56562DUP	Water	07/18/18
38	B18-10116MS	56570MS	Water	07/19/18
39	B18-10116MSD	56570MSD	Water	07/19/18
40	B18-10116DUP	56570DUP	Water	07/19/18
41	B18-20116MS	56571MS	Water	07/19/18
42	B18-20116MSD	56571MSD	Water	07/19/18
43	B18-20116DUP	56571DUP	Water	07/19/18
44	B18-10178MS	56577MS	Water	07/20/19
45	B18-10178MSD	56577MSD	Water	07/20/19
46	B18-10178DUP	56577DUP	Water	07/20/19
47	B18-10076FDUP	56562FDUP	Water	07/18/18
48	B18-10116FDUP	56570FDUP	Water	07/19/18
49	B18-20116FDUP	56571FDUP	Water	07/19/18
50	B18-10178FDUP	56577FDUP	Water	07/20/19

LDC #: 45386D4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/15
SDG #: 1807003-007 Level II/IV Page: 2 of 3
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

51	#28 MS			
52	#28 MSD			
53				

Notes:

LDC #: US3860 4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: Q

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-34		[✓ Al, Sb, As, Ba, Be, Cd,] Ca [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC:35-37, 47		[✓ Al, Sb, As,] Ba, [✓ Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___
~~38-40, 48~~		~~[✓ Al, Sb, As,] [✓ Ba,] [✓ Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,]~~ ___
38-40, 48		Al, Sb, As, [✓ Ba,] Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
41-42		[✓ Al,] Sb, [✓ As,] Ba, [✓ Be,] Cd, Ca, [✓ Cr, Co,] [✓ Cu,] Fe, Pb, Mg, [✓ Mn,] [✓ Hg,] Ni, K, Se, [✓ Ag,] Na, [✓ Tl,] [✓ V,] Zn, Mo, B, Sn, [✓ Ti,] ___
51, 52		Al, [✓ Sb,] As, Ba, Be, [✓ Cd,] Ca, Cr, Co, [✓ Cu,] [✓ Fe, Pb,] Mg, Mn, Hg, [✓ Ni,] K, [✓ Se,] Ag, Na, Tl, V, Zn, [✓ Mo,] B, [✓ Sn,] Ti, ___
43, 49		[✓ Al, Sb, As,] Ba, [✓ Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___
44-46, 50		Al, Sb, As, [✓ Ba,] Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45386Q1a

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: CR

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?		✓		
Were the low standard checks within 70-130%			✓	
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.		✓		
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?		✓		

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?		✓		
If the %Rs were outside the criteria, was a reanalysis performed?		✓		
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?			✓	
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.				✓
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓	✓	
Target analytes were detected in the field blanks.				

LDC #: 45386D4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CQ
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Code: H	Det/ND		
1-5, 18-22	7/18/18	9/1/18	45	J/UJ/P	ND		
6-11, 23-28	7/19/18	9/1/18	44	J/UJ/P	ND		
12-17, 29-34	7/20/18	9/1/18	43	J/UJ/P	ND		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45356D1

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: AT
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%)?

LEVEL IV ONLY:

Y N N/A Was a midrange cyanide standard distilled?

Y N N/A Are all correlation coefficients ≥0.995?

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data	
		CCV	All except ~~Ba~~ Hg	7 10 samples between CCVs	1-3,5,6,8-10,18-20, 22,23,25-27	Text	
	10/15/19	ICV (19:02)	Se	110.8 (90-110)	1-3,5,6,8-10,18-20,22,23,25-27	J det/P (Det)	HV
	10/15/19	CCV (23:43)	Se	118.2	↓	↓	HC
	10/15/19	CCV (18:23)	Be	85.9	↓	J UJ/P (Det/ND)	LC

Comments:

LDC #:_____
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: CR
2nd Reviewer: A

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

#	Date	Blank ID	Analyte	Finding	Associated Samples	Qualifications
			~~Hg~~ All	no closing CCB	1-3, 5, 6, 8-10, 18-20, 22, 23, 25-27	Text
			~~All except Ba Hg~~	no closing CCB	↓	Text C

Comments:_____

LDC #: 45386D4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications	
	35/36		Sb	11	11		1-10	J/R/A (Det)	LM
			Fe	130	155			Jdet/A (Det)	HM
			Ti	44	44			J/UJ/A (Det)	LM
	51/52		Sb	10	10		28-34	J/R/A (Det)	LM
			Fe	690	630			Jdet/A (34=Det)	HM
	41/42		Be	73	71		11-17	J/UJ/A (Det/ND)	LM
			Ag	74				J/UJ/A (ND)	LM
			Ti	155				Jdet/A (Det)	HM
			Al			67		J/UJ/A (Det)	HD
			Ti			37		J/UJ/A (Det)	J

Comments: 35/36, 38/39: Al>4x

LDC #: 45386D4

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? 25

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits) (S/L)	Associated Samples	Qualifications
		37		Cd	67		1-10	J/UJ/A (Det)
				Se		0.019 (≤0.015)	↓	↓ (Det/ND)
		43		Zn	38		11-17	J/UJ/A (Det)
		47		Cd	31		18-27	J/UJ/A (Det/ND)
				Pb	52		↓	↓ ↓
		49		Ti	44		28-34	J/UJ/A (Det)

Comments: _____

DUP.wpd

LDC #: 45386D4a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS/LCSD ID	Matrix	Analyte	LCS %R (limits)	LCSD %R (limits)	RPD (limits)	Associated Samples	Qualifications HF
	56560-LCS	1/2	Zn	121 (72-116)			1-10, 18-27	J det/P(Det) HF HO
			Zn			33 (≤30)	↓	J det/P(Det) ↓ ↓ ↓
			Ti			35 (≤30)	↓	
	57249-LCS	1/2	Ag	~~56 (61-113)~~	56 (61-113)		11-17, 28-34	J/UJ/P(MD) LP

Comments: _____

LCSD.wpd

LDC#: 45386D4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	10	11	
Aluminum	216	246	13
Antimony	0.115	0.102	12
Arsenic	1.27	1.51	17
Barium	8.1	7.71	5
Beryllium	0.005U	0.0154	NC
Cadmium	0.0274	0.0521	62
Chromium	0.261	0.521	66
Cobalt	0.0971	0.115	17
Copper	1.96	3.01	42
Iron	128	112	13
Lead	0.285	0.378	28
Manganese	8.27	8.4	2
Molybdenum	8.84	7.27	19
Nickel	0.432	0.473	9
Selenium	0.0201	0.012	50
Thallium	0.009	0.00847	6
Tin	0.00692	0.0102	38
Titanium	22	33.6	42
Vanadium	2.63	2.96	12

LDC#: 45386D4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	10	11	
Zinc	6.22	5.71	9

Analyte	Concentration (ug/L)		RPD
	27	28	
Antimony	0.14	0.169	19
Arsenic	1.33	1.5	12
Barium	9.14	8.82	4
Beryllium	0.00549	0.005U	NC
Cadmium	0.0281	0.049	54
Chromium	0.0531	0.104	65
Cobalt	0.0451	0.052	14
Copper	1.56	2.42	43
Lead	0.0025U	0.0388	NC
Manganese	3.47	3.65	5
Molybdenum	9.6	8.58	11
Nickel	0.375	0.436	15
Selenium	0.0225	0.0188	~~NC~~ 18
Thallium	0.00736	0.00804	9
Tin	0.005U	0.00902	NC
Titanium	22	18	20

LDC#: 45386D4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	27	28	
Vanadium	2.3	2.54	10
Zinc	4.28	6.01	34

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45386D4a.wpd

LDC #: 45366Q1k

VALIDATION FINDINGS WORKSHEET
Internal Standards (ICP-MS)

Page: 1 of 1
Reviewer: CW
2nd Reviewer: CW

METHOD: Metals (EPA Method 200.8)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard percent recoveries within 60-125% of the intensity of the internal standard in the initial calibration standard ?

Y N N/A If the response to the above question is no, were the samples reanalyzed as required ?

#	Date	Internal Standard	Associated Metals	%R (Limits)	Associated Samples	Qualifications
		Rh (Tune 1)	Se	0.1	6	J/R1P (Det)
		Rh (Tune 2)	Fe, Ni, Cu, Mo, Cd, Sn, Sb	59.3	6	J/UJ/P (Det)

LDC #: 53860 4T

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: a
2nd Reviewer: a

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV	ICP/MS (Initial calibration)	Cd	107.172	100	107	—	Y
IPR	CVAA (Initial calibration)	Hg	1020	1000	102	~~102~~	Y
	ICP (Continuing calibration)						
CCV	ICP/MS (Continuing calibration)	Ba	100	98.56	99	—	Y
CRR	CVAA (Continuing calibration)	Hg	986	1000	99	—	Y

Comments:

LDC #: 45386D4T

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: CR
2nd Reviewer: CR

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{Found}{True} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N	ICP interference check						
LCS	Laboratory control sample	Hg	0.901	1.0	90	90	Y
35	Matrix spike	Be	(SSR-SR) 17.2	20	86	86	↓
35/36	Duplicate	Sb	2.33	2.29	0	0	↓
N	ICP serial dilution						

Comments: _____

LDC #: 45366O1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: CA
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Al were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

Recalculation:
Raw data = 158.246ug/L

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	1	Al	158	158	
	2	Ba	8.16	8.16	
	3	As	1.33	1.326	
	5	Cd	0.0975	0.0975	
	6	Tl	0.0071	0.0071	
	8	Mo	8.80	8.82	
	9	Sn	0.0188	0.0188	
	10	Pb	0.285	0.285	
	18	Co	0.0324	0.0329	
	19	Be	7.33	7.33	
	20	Mn	3.38	3.38	
	22	Cu	0.811	0.811	
	23	V	2.0	2.3	
	25	Ni	0.361	0.361	
	26	Sn	0.0185	0.0185	
	27	As	1.33	1.33	

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II & IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-007

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022**	56561**	Water	07/18/18
B18-10076**	56562**	Water	07/18/18
B18-10077**	56563**	Water	07/18/18
B18-10112	56564	Water	07/18/18
B18-10113**	56565**	Water	07/18/18
B18-10024**	56566**	Water	07/19/18
B18-10029	56567	Water	07/19/18
B18-10114**	56568**	Water	07/19/18
B18-10115**	56569**	Water	07/19/18
B18-10116**	56570**	Water	07/19/18
B18-20116	56571	Water	07/19/18
B18-10031	56572	Water	07/20/19
B18-10032	56573	Water	07/20/19
B18-10119	56574	Water	07/20/19
B18-10121	56575	Water	07/20/19
B18-10123	56576	Water	07/20/19
B18-10178	56577	Water	07/20/19
B18-10076MS	56562MS	Water	07/18/18
B18-10076MSD	56562MSD	Water	07/18/18
B18-10076DUP	56562DUP	Water	07/18/18
B18-10077MS	56563MS	Water	07/18/18
B18-10077MSD	56563MSD	Water	07/18/18
B18-10077DUP	56563DUP	Water	07/18/18

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10112 B18-10113**	Nitrate as N	55 days	2 days	J (all detects)	P
B18-10022** B18-10076** B18-10077**	Nitrate as N	55 days	2 days	R (all non-detects)	P
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113**	Total orthophosphate as P	37 days	2 days	J (all detects)	P
B18-10024** B18-10029 B18-10114** B18-10115**	Nitrate as N	54 days	2 days	J (all detects)	P
B18-10116** B18-20116	Nitrate as N	54 days	2 days	R (all non-detects)	P
B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116	Total orthophosphate as P	36 days	2 days	J (all detects)	P
B18-10031 B18-10119 B18-10121 B18-10123 B18-10178	Nitrate as N	53 days	2 days	J (all detects)	P
B18-10032	Nitrate as N	53 days	2 days	R (all non-detects)	P
B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Total orthophosphate as P	35 days	2 days	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (All samples in SDG 1807003-007)	Methylene blue active substances	26 (≤25)	J (all detects) UJ (all non-detects)	A

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10076DUP (All samples in SDG 1807003-007)	Total suspended solids	29 (≤25)	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

Samples B18-10116** and B18-20116 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	B18-10116**	B18-20116	
Ammonia as N	0.0246	0.0423	53
Dissolved organic carbon	1.65	2.02	20
Methylene blue active substances	0.0155	0.0223	36
Total organic carbon	1.62	2.27	33
Total orthophosphate as P	0.0378	0.0386	2
Total suspended solids	5.45	6.2	13

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation.

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-007	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in six samples.

Due to technical holding time, MS/MSD RPD, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-007

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10031 B18-10119 B18-10121 B18-10123 B18-10178	Nitrate as N	J (all detects)	P	Technical holding times (H)
B18-10022** B18-10076** B18-10077** B18-10116** B18-20116 B18-10032	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Methylene blue active substances	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Total suspended solids	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022** B18-10076** B18-10077** B18-10112 B18-10113** B18-10024** B18-10029 B18-10114** B18-10115** B18-10116** B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-007

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-007

No Sample Data Qualified in this SDG

LDC #: 45386D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-007 Level II/IV Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 2
2nd Reviewer:

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	A	Not reviewed for Level II validation
III.	Calibration verification	A	Not reviewed for Level II validation
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	(10,11)
X.	Sample result verification	A	Not reviewed for Level II validation
XI.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
**Indicates samples underwent Level IV review

	Client ID	Lab ID	Matrix	Date
1	B18-10022**	56561**	Water	07/18/18
2	B18-10076**	56562**	Water	07/18/18
3	B18-10077**	56563**	Water	07/18/18
4	B18-10112	56564	Water	07/18/18
5	B18-10113**	56565**	Water	07/18/18
6	B18-10024**	56566**	Water	07/19/18
7	B18-10029	56567	Water	07/19/18
8	B18-10114**	56568**	Water	07/19/18
9	B18-10115**	56569**	Water	07/19/18
10	B18-10116**	56570**	Water	07/19/18
11	B18-20116	56571	Water	07/19/18
12	B18-10031	56572	Water	07/20/19
13	B18-10032	56573	Water	07/20/19
14	B18-10119	56574	Water	07/20/19
15	B18-10121	56575	Water	07/20/19
16	B18-10123	56576	Water	07/20/19
17	B18-10178	56577	Water	07/20/19

LDC #: 45386D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-007 Level II/IV Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

18	B18-10076MS	56562MS	Water	07/18/18
19	B18-10076MSD	56562MSD	Water	07/18/18
20	B18-10076DUP	56562DUP	Water	07/18/18
21	B18-10077MS	56563MS	Water	07/18/18
22	B18-10077MSD	56563MSD	Water	07/18/18
23	B18-10077DUP	56563DUP	Water	07/18/18
24				
25				
26				

Notes:

LDC #: 45386D6

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		✓		
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.		✓		
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓	✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓	✓	
Target analytes were detected in the field blanks.				

LDC #: 45386D6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-17	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O+G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 18-20	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS]
21-23	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN NH_3 TKN TOC Cr6+ ClO_4
20	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ TSS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386D6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria? Code: H

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-5	7/18/18	9/11/18	55	J/R/P (ND = 1-3)	8/24/18	37	J/R/P (Det)
6-11	7/19/18	9/11/18	54	J/R/P (ND = 10, 11)	8/24/18	36	J/R/P (Det)
12-17	7/20/18	9/11/18	53	J/R/P (ND = 13)	8/24/18	35	J/R/P (Det)

LDC #: 45386J6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

(Y) N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	18/19		MBAS			26 (≤30 25)	All	J (all detects/MD)

Comments:

LDC #: 45366D6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: G
2nd Reviewer: [illegible]

METHOD: Inorganics, Method_____

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		20		TSS	29 (≤25)		All	J (all detects)

Comments:_____

LDC#: 45386D6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer: [signature]
2nd Reviewer: [signature]

Inorganics, Method See Cover

Analyte	Concentration (mg/L)		RPD
	10	11	
Ammonia as N	0.0246	0.0423	53
DOC	1.65	2.02	20
MBAS	0.0155	0.0223	36
TOC	1.62	2.27	33
Total orthophosphate as P	0.0378	0.0386	2
TSS	5.45	6.2	13

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45386D6.wpd

LDC #: 45386D6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of MBAS was recalculated. Calibration date: 10/10/16

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	MBAS	s1	0.0	0	*0.9983*	*0.9984*	Y
		s2	0.05	0.0065			
		s3	0.1	0.0163			
		s4	0.5	0.0937			
		s5	0.75	0.1584			
		s6	1	0.2156			
Calibration verification	NH_3	ICV	0.0702 → 0.075		94	-	
Calibration verification	CCV → TOC	10	9.8688		99	-	
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45356QC

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	TOC	8.51	10	85	85	Y
21	Matrix spike sample	NO_3N	(SSR-SR) 0.553	0.5	111	111	
20	Duplicate sample	TSS	3.9	5.2	29	29	

Comments: _____

LDC #: 45366D6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CK
2nd reviewer:

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for oPO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = 0.6153x - 0.002078$

Recalculation: $\frac{0.011 + 0.002078}{0.6153} = 0.02126$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	NH_3-N	0.079	0.0779	Y
	2	DOC	1.66	1.66	↓
	3	MBAS	0.0191	0.0201	
	5	NO_3-N	0.0242	0.0242	
	6	TOC	1.61	1.61	
	8	oPO4	0021	~~0.0218~~ 0.021	Y
	9	TSS	3.35	3.35	Y
	10	↓	5.45	5.45	Y

Note:

LDC Report# 45386E2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-009

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56669	Water	07/26/18
B18-10126	56670	Water	07/26/18
B18-10127	56671	Water	07/26/18
B18-10132	56672	Water	07/26/18
B18-10133	56673	Water	07/26/18
B18-20133	56674	Water	07/26/18
B18-10136	56675	Water	07/27/18
B18-10137	56676	Water	07/27/18
B18-10139	56677	Water	07/27/18
B18-10140	56678	Water	07/27/18
B18-10141	56679	Water	07/27/18
B18-10142	56680	Water	07/27/18
B18-10133MS	56673MS	Water	07/26/18
B18-10133MSD	56673MSD	Water	07/26/18
B18-10133DUP	56673DUP	Water	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	43 (50-150) 46 (50-150) 37 (50-150)	- - -	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	45 (≤25) 44 (≤25) 60 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133DUP (B18-10133)	Acenaphthene Fluorene	31 (≤25) 41 (≤25)	NA	-

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56667-BS1/BS2 (All samples in SDG 1807003-009)	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	49 (70-130) 52 (70-130) 41 (70-130)	67 (70-130) - 69 (70-130)	J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56667-BS1/BS2 (All samples in SDG 1807003-009)	1-Methylnaphthalene Naphthalene	31 (≤30) 51 (≤30)	NA	-
56667-BS1/BS2 (B18-10124 B18-10126 B18-10137 B18-10139 B18-10141)	2-Methylnaphthalene	31 (≤30)	J (all detects)	P
56667-BS1/BS2 (B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10140 B18-10142)	2-Methylnaphthalene	31 (≤30)	NA	-

X. Field Replicates

Samples B18-10133 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/L)		RPD
	B18-10133	B18-20133	
Acenaphthene	2.89	2.44	17
Fluoranthene	3.01	2.60	15
Phenanthrene	2.51	1.94	26
Pyrene	1.71	2.06	19
Fluorene	5U	1.58	Not calculable

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-009	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, LCS/LCSD %R and RPD, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-009

Sample	Compound	Flag	A or P	Reason (Code)
B18-10133	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	J (all detects) UJ (all non-detects)	A	Laboratory control samples (%R) (LL)
B18-10124 B18-10126 B18-10137 B18-10139 B18-10141	2-Methylnaphthalene	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-009

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-009

No Sample Data Qualified in this SDG

LDC #: 45386E2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/9/19
SDG #: 1807003-009 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: Q
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	Temp @ 11.4 °C - Not enough time
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /OMP	SW	
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	SW	D=5+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56669	Water	07/26/19
2	B18-10126	56670	Water	07/26/19
3	B18-10127	56671	Water	07/26/19
4	B18-10132	56672	Water	07/26/19
5	B18-10133	56673	Water	07/26/19
6	B18-20133	56674	Water	07/26/19
7	B18-10136	56675	Water	07/27/19
8	B18-10137	56676	Water	07/27/19
9	B18-10139	56677	Water	07/27/19
10	B18-10140	56678	Water	07/27/19
11	B18-10141	56679	Water	07/27/19
12	B18-10142	56680	Water	07/27/19
13	B18-10133MS	56673MS	Water	07/26/19

LDC #: 45386E2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/8/19
SDG #: 1807003-009 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 9
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

14	B18-10133MSD	56673MSD	Water	07/26/19
15	B18-10133DUP	56673DUP	Water	07/26/19
16				
17				
18				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 15386c2b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: _____

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	13	TTT	43 (50-150)	( )	( )	5 (ND)	J/UJ/A (LM)
		W	46 (	)	( )	( )	↓
		S	37 ↓	)	( )	( )	
		TTT	( )	( )	45 (≤25)		J/UJ/A (HD)
		W	( )	( )	44 (	)	↓
		S	( )	( )	60 ↓	)	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	15	~~TTT~~	( )	( )	31 (≤25)	5 (13)	J/UJ/A (HD)
		NN	( )	( )	41 ↓	)	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Privileged and Confidential

LDC #: 45386Z2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
[✓ Y] N ~~N/A~~ Was a LCS required?
Y [✓ N] ~~N/A~~ Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56667-BS1/	TTT	49 (70-130)	67 (70-130)	( )	All (dets + ND)	J/UJ/A (<R)
		-BS2	W	52 (↓)	(↓)	( )		↓
			S	41 (↓)	69 (↓)	( )		↓
			TTT	( )	( )	31 (≤30)	(ND)	J dets/A (HD)
			W	( )	( )	31 (↓)	(dets=1-2,8-9,11)	↓
			S	( )	( )	51 (↓)	(ND)	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC#: 45386E2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 6of 7
Reviewer: 9
2nd Reviewer:

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/L)		RPD
	5	6	
GG	2.89	2.44	17
YY	3.01	2.60	15
UU	2.51	1.94	26
ZZ	1.71	2.06	19
NN	5U	1.58	NC

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2019\45386E2b_RHMP.wpd

LDC Report# 45386E4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-009

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56669	Water	07/26/18
B18-10126	56670	Water	07/26/18
B18-10127	56671	Water	07/26/18
B18-10132	56672	Water	07/26/18
B18-10133	56673	Water	07/26/18
B18-20133	56674	Water	07/26/18
B18-10136	56675	Water	07/27/18
B18-10137	56676	Water	07/27/18
B18-10139	56677	Water	07/27/18
B18-10140	56678	Water	07/27/18
B18-10141	56679	Water	07/27/18
B18-10142	56680	Water	07/27/18
B18-10124F	56669F	Water	07/26/18
B18-10126F	56670F	Water	07/26/18
B18-10127F	56671F	Water	07/26/18
B18-10132F	56672F	Water	07/26/18
B18-10133F	56673F	Water	07/26/18
B18-20133F	56674F	Water	07/26/18
B18-10136F	56675F	Water	07/27/18
B18-10137F	56676F	Water	07/27/18
B18-10139F	56677F	Water	07/27/18
B18-10140F	56678F	Water	07/27/18
B18-10141F	56679F	Water	07/27/18
B18-10142F	56680F	Water	07/27/18
B18-10133MS	56673MS	Water	07/26/18
B18-10133MSD	56673MSD	Water	07/26/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10133DUP	56673DUP	Water	07/26/18
B18-10133FDUP	56673FDUP	Water	07/26/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10124F B18-10126F B18-10127F B18-10132F B18-10133F B18-20133F	Mercury	39	28	UJ (all non-detects)	P
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142 B18-10136F B18-10137F B18-10139F B18-10140F B18-10141F B18-10142F	Mercury	38	28	UJ (all non-detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140)	Aluminum Beryllium Iron	70 (75-125) 72 (75-125) -	60 (75-125) 71 (75-125) 65 (75-125)	J (all detects) UJ (all non-detects)	A
B18-10133MS/MSD (B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140)	Antimony	10 (75-125)	9 (75-125)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10133FDUP (B18-10124F B18-10126F B18-10127F B18-10132F B18-10133F B18-20133F B18-10136F B18-10137F B18-10139F B18-10140F)	Cadmium Iron Lead	29 (≤25) 26 (≤25) 65 (≤25)	J (all detects) UJ (all non-detects)	A

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10133DUP (B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140)	Cadmium Lead Zinc	79 (≤25) 71 (≤25) 28 (≤25)	J (all detects) J (all detects) J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

Samples B18-10133 and B18-20133 and samples B18-10133F and B18-20133F were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	B18-10133	B18-20133	
Aluminum	115	220	63
Antimony	0.142	0.102	33
Arsenic	1.46	1.51	3
Barium	8.44	7.9	7
Cadmium	0.116	0.0561	70
Chromium	0.297	0.454	42
Cobalt	0.0285	0.0572	67

Analyte	Concentration (ug/L)		RPD
	B18-10133	B18-20133	
Copper	3.81	3.91	3
Iron	77.4	134	54
Lead	0.38	0.355	7
Manganese	10.4	11.6	11
Molybdenum	9.25	8.28	11
Nickel	0.624	0.557	11
Selenium	0.0198	0.0241	20
Silver	0.0162	0.017	5
Tin	0.0269	0.0128	71
Titanium	23.3	26.4	12
Vanadium	2.49	2.68	7
Zinc	7.32	5.56	27

Analyte	Concentration (ug/L)		RPD
	B18-10133F	B18-20133F	
Antimony	0.149	0.12	22
Arsenic	1.36	1.49	9
Barium	8.21	9.76	17
Cadmium	0.0645	0.0616	5
Chromium	0.115	0.12	4
Copper	3.4	3.02	12
Iron	1.09	0.5U	Not calculable
Lead	0.0729	0.0433	51

Analyte	Concentration (ug/L)		RPD
	B18-10133F	B18-20133F	
Manganese	8.19	8.47	3
Molybdenum	9.42	9.33	1
Nickel	0.597	0.571	4
Selenium	0.0161	0.0325	67
Silver	0.0154	0.0132	15
Titanium	17.5	19.8	12
Vanadium	2.4	2.47	3
Zinc	4.95	4.61	7

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-009	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in twenty-four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-009

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142 B18-10124F B18-10126F B18-10127F B18-10132F B18-10133F B18-20133F B18-10136F B18-10137F B18-10139F B18-10140F B18-10141F B18-10142F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140	Aluminum Beryllium Iron	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140	Antimony	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124F B18-10126F B18-10127F B18-10132F B18-10133F B18-20133F B18-10136F B18-10137F B18-10139F B18-10140F	Cadmium Iron Lead	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (HD)

LDC #: 45386E4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-009 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D Sam/D
XI.	Field Duplicates	SW	(5,6) (17,18)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56669	Water	07/26/19
2	B18-10126	56670	Water	07/26/19
3	B18-10127	56671	Water	07/26/19
4	B18-10132	56672	Water	07/26/19
5	B18-10133	56673	Water	07/26/19
6	B18-20133	56674	Water	07/26/19
7	B18-10136	56675	Water	07/27/19
8	B18-10137	56676	Water	07/27/19
9	B18-10139	56677	Water	07/27/19
10	B18-10140	56678	Water	07/27/19
11	B18-10141	56679	Water	07/27/19
12	B18-10142	56680	Water	07/27/19
13	B18-10124F	56669F	Water	07/26/19
14	B18-10126F	56670F	Water	07/26/19
15	B18-10127F	56671F	Water	07/26/19

LDC #: 45386E4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-009 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10132F	56672F	Water	07/26/19
17	B18-10133F	56673F	Water	07/26/19
18	B18-20133F	56674F	Water	07/26/19
19	B18-10136F	56675F	Water	07/27/19
20	B18-10137F	56676F	Water	07/27/19
21	B18-10139F	56677F	Water	07/27/19
22	B18-10140F	56678F	Water	07/27/19
23	B18-10141F	56679F	Water	07/27/19
24	B18-10142F	56680F	Water	07/27/19
25	B18-10133MS	56673MS	Water	07/26/19
26	B18-10133MSD	56673MSD	Water	07/26/19
27	B18-10133DUP	56673DUP	Water	07/26/19
28	B18-10133FDUP	56673FDUP	Water	07/26/19
29				
30				
31				

Notes:

LDC #: 45386E4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-24		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti,] ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, ~~Sn,~~ Ti, ___ ___
QC:25-26		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti,] ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45386E4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: H	Det/ND		
1-6, 13-18	7/26/18	9/3/18	39	J/UJ/P	ND		
7-12, 19-24	7/27/18	9/3/18	38	J/UJ/P	ND		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45386E4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: CW
2nd Reviewer: AV

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	25/26		Al	70	60		1-10	Jdet/A (Det) LM
			Sb	10	9			J/R/A (Det)
			Be	72	71			J/UJ/A (Det/ND)
			Fe		65			J/UJ/A (Det)

Comments:

LDC #: 45386E4

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? 25

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		28		Cd	29		13-22	J/UJ/A (Det)
				Fe	26			
				Pb	65			
		27		Cd	79		1-10	J/UJ/A (Det)
				Pb	71			
				Zn	28			

Comments: _____

DUP.wpd

LDC#: 45386E4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: A
2nd Reviewer: S

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	5	6	
Aluminum	115	220	63
Antimony	0.142	0.102	33
Arsenic	1.46	1.51	3
Barium	8.44	7.9	7
Cadmium	0.116	0.0561	70
Chromium	0.297	0.454	42
Cobalt	0.0285	0.0572	67
Copper	3.81	3.91	3
Iron	77.4	134	54
Lead	0.38	0.355	7
Manganese	10.4	11.6	11
Molybdenum	9.25	8.28	11
Nickel	0.624	0.557	11
Selenium	0.0198	0.0241	20
Silver	0.0162	0.017	5
Tin	0.0269	0.0128	71
Titanium	23.3	26.4	12
Vanadium	2.49	2.68	7
Zinc	7.32	5.56	27

LDC#: 45386E4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	17	18	
Antimony	0.149	0.12	22
Arsenic	1.36	1.49	9
Barium	8.21	9.76	17
Cadmium	0.0645	0.0616	5
Chromium	0.115	0.12	4
Copper	3.4	3.02	12
Iron	1.09	0.5U	NC
Lead	0.0729	0.0433	51
Manganese	8.19	8.47	3
Molybdenum	9.42	9.33	1
Nickel	0.597	0.571	4
Selenium	0.0161	0.0325	67
Silver	0.0154	0.0132	15
Titanium	17.5	19.8	12
Vanadium	2.4	2.47	3
Zinc	4.95	4.61	7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-009

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56669	Water	07/26/18
B18-10126	56670	Water	07/26/18
B18-10127	56671	Water	07/26/18
B18-10132	56672	Water	07/26/18
B18-10133	56673	Water	07/26/18
B18-20133	56674	Water	07/26/18
B18-10136	56675	Water	07/27/18
B18-10137	56676	Water	07/27/18
B18-10139	56677	Water	07/27/18
B18-10140	56678	Water	07/27/18
B18-10141	56679	Water	07/27/18
B18-10142	56680	Water	07/27/18
B18-10133MS	56673MS	Water	07/26/18
B18-10133MSD	56673MSD	Water	07/26/18
B18-10133DUP	56673DUP	Water	07/26/18
B18-20133MS	56674MS	Water	07/26/18
B18-20133MSD	56674MSD	Water	07/26/18
B18-20133DUP	56674DUP	Water	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133	Nitrate as N	47 days	2 days	R (all non-detects)	P
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133	Total orthophosphate as P	5 days	2 days	J (all detects)	P
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Nitrate as N	46 days	2 days	R (all non-detects)	P
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Total orthophosphate as P	4 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10133DUP (All samples in SDG 1807003-009)	Total suspended solids	44 (≤25)	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

Samples B18-10133 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	B18-10133	B18-20133	
Ammonia as N	0.0175	0.0498	96
Dissolved organic carbon	1.73	1.52	13
Methylene blue active substances	0.0109	0.0169	43
Total organic carbon	1.75	1.83	4
Total orthophosphate as P	0.0383	0.0462	19
Total suspended solids	2.89	3.6	22

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-009	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in twelve samples.

Due to technical holding time, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-009

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Total suspended solids	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-009

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-009

No Sample Data Qualified in this SDG

LDC #: 45386E6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-009 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	A	LCS ID (5,6)
IX.	Field duplicates	SW	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56669	Water	07/26/19
2	B18-10126	56670	Water	07/26/19
3	B18-10127	56671	Water	07/26/19
4	B18-10132	56672	Water	07/26/19
5	B18-10133	56673	Water	07/26/19
6	B18-20133	56674	Water	07/26/19
7	B18-10136	56675	Water	07/27/19
8	B18-10137	56676	Water	07/27/19
9	B18-10139	56677	Water	07/27/19
10	B18-10140	56678	Water	07/27/19
11	B18-10141	56679	Water	07/27/19
12	B18-10142	56680	Water	07/27/19
13	B18-10133MS	56673MS	Water	07/26/19
14	B18-10133MSD	56673MSD	Water	07/26/19
15	B18-10133DUP	56673DUP	Water	07/26/19
16	B18-20133MS	56674MS	Water	07/26/19
17	B18-20133MSD	56674MSD	Water	07/26/19

LDC #: 45386E6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-009 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: G
2nd Reviewer: G

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

18	B18-20133DUP	56674DUP	Water	07/26/19
19				
20				
21				

Notes:

LDC #: 45386E6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-12	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:13-15	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ O&G]
16 18	pH TDS Cl F [✓ NO_3] NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
15	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ TSS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386E6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

(HT)

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/26/18	9/11/18	47	J/R/P (ND)	7/31/18	5	J/R/P (Det)
7-12	7/27/18	9/11/18	46	J/R/P (ND)	7/31/18	4	J/UJ/P (Det)

LDC #: 45366E6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: C
2nd Reviewer: CA

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

ND

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		1S		TSS	44 (≤25)		All	J (UJ/AC (Bat))

Comments:

LDC#: 45386E6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/L)		RPD
	5	6	
Ammonia as N	0.0175	0.0498	96
DOC	1.73	1.52	13
MBAS	0.0109	0.0169	43
TOC	1.75	1.83	4
Total orthophosphate as P	0.0383	0.0462	19
TSS	2.89	3.6	22

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45386E6.wpd

LDC Report# 45386F2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 10, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-011

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56736	Water	07/30/18
B18-10035	56737	Water	07/30/18
B18-10036	56738	Water	07/30/18
B18-10143	56739	Water	07/30/18
B18-10144	56740	Water	07/30/18
B18-10039	56741	Water	07/30/18
B18-10144MS	56740MS	Water	07/30/18
B18-10144MSD	56740MSD	Water	07/30/18
B18-10144DUP	56740DUP	Water	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56734-BS1/BS2 (All samples in SDG 1807003-011)	Naphthalene	67 (70-130)	31 (70-130)	J (all detects) UJ (all non-detects)	P
	1-Methylnaphthalene	-	43 (70-130)		
	2,6-Dimethylnaphthalene	-	69 (70-130)		
	2-Methylnaphthalene	-	45 (70-130)		
	Acenaphthylene	-	69 (70-130)		
	Biphenyl	-	68 (70-130)		

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56734-BS1/BS2 (All samples in SDG 1807003-011)	1-Methylnaphthalene	53 (≤30)	NA	-
56734-BS1/BS2 (B18-10144 B18-10039)	2-Methylnaphthalene	54 (≤30)	J (all detects)	P
56734-BS1/BS2 (B18-10034 B18-10035 B18-10036 B18-10143)	2-Methylnaphthalene	54 (≤30)	NA	-
56734-BS1/BS2 (B18-10039)	Biphenyl	32 (≤30)	J (all detects)	P
56734-BS1/BS2 (B18-10034 B18-10035 B18-10036 B18-10143 B18-10144)	Biphenyl	32 (≤30)	NA	-
56734-BS1/BS2 (B18-10144)	Naphthalene	73 (≤30)	J (all detects)	P
56734-BS1/BS2 (B18-10034 B18-10035 B18-10036 B18-10143 B18-10039)	Naphthalene	73 (≤30)	NA	-

X. Field Replicates

No field replicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-011	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and RPD and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-011

Sample	Compound	Flag	A or P	Reason (Code)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Naphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthylene Biphenyl	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10144 B18-10039	2-Methylnaphthalene	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10039	Biphenyl	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10144	Naphthalene	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-011

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-011

No Sample Data Qualified in this SDG

LDC #: 45386F2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/9/19
SDG #: 1807003-011 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates/DUP	A/A	
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56736	Water	07/30/18
2	B18-10035	56737	Water	07/30/18
3	B18-10036	56738	Water	07/30/18
4	B18-10143	56739	Water	07/30/18
5	B18-10144	56740	Water	07/30/18
6	B18-10039	56741	Water	07/30/18
7	B18-10144MS	56740MS	Water	07/30/18
8	B18-10144MSD	56740MSD	Water	07/30/18
9	B18-10144DUP	56740DUP	Water	07/30/18
10				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45384F2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: 9
2nd Reviewer: _____

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5634-BS1/-BS2	S	67 (70-130)	31 (70-130)	( )	All (dets+ND)	J/UJ/A (LL)
			TTT	( )	43 ( )	( )		
			XXX	( )	59 ( )	( )		
			W	( )	45 ( )	( )		
			DD	( )	69 ( )	( )		
			EEEE	( )	68 ( )	( )		
			TTT	( )	( )	53 (≤30)		J dets/A (HD)
			W	( )	( )	54 ( )	(dets=5-6)	
			EEEE	( )	( )	32 ( )	(dets=6)	
			S	( )	( )	73 ( )	(dets=5)	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC Report# 45386F4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-011

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56736	Water	07/30/18
B18-10035	56737	Water	07/30/18
B18-10036	56738	Water	07/30/18
B18-10143	56739	Water	07/30/18
B18-10144	56740	Water	07/30/18
B18-10039	56741	Water	07/30/18
B18-10034F	56736F	Water	07/30/18
B18-10035F	56737F	Water	07/30/18
B18-10036F	56738F	Water	07/30/18
B18-10143F	56739F	Water	07/30/18
B18-10144F	56740F	Water	07/30/18
B18-10039F	56741F	Water	07/30/18
B18-10144MS	56740MS	Water	07/30/18
B18-10144MSD	56740MSD	Water	07/30/18
B18-10144DUP	56740DUP	Water	07/30/18
B18-10144FDUP	56740FDUP	Water	07/30/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039 B18-10034F B18-10035F B18-10036F B18-10143F B18-10144F B18-10039F	Mercury	35	28	UJ (all non-detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039)	Antimony	12 (75-125)	11 (75-125)	J (all detects)	A
B18-10144MS/MSD (B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039)	Manganese Silver	55 (75-125) -	42 (75-125) 57 (75-125)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

For B18-10144MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039)	Aluminum Iron Manganese Silver	39 (≤25) 360 (≤25) 27 (≤25) 31 (≤25)	J (all detects) UJ (all non-detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	Difference (Limits)	Flag	A or P
B18-10144FDUP (B18-10034F B18-10035F B18-10036F B18-10143F B18-10144F B18-10039F)	Selenium Tin	0.0259 ug/L (≤0.015) 0.0662 ug/L (≤0.01)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

No field replicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-011	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, DUP difference, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-011

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039 B18-10034F B18-10035F B18-10036F B18-10143F B18-10144F B18-10039F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Antimony	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Manganese Silver	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Aluminum Iron Manganese Silver	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10034F B18-10035F B18-10036F B18-10143F B18-10144F B18-10039F	Selenium Tin	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference) (HD)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039 B18-10034F B18-10035F B18-10036F B18-10143F B18-10144F B18-10039F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-011

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-011

No Sample Data Qualified in this SDG

LDC #: 45386F4a

SDG #: 1807003-011

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 7/5/19

Page: 1 of 2

Reviewer: E

2nd Reviewer: T

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, SRM/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56736	Water	07/30/18
2	B18-10035	56737	Water	07/30/18
3	B18-10036	56738	Water	07/30/18
4	B18-10143	56739	Water	07/30/18
5	B18-10144	56740	Water	07/30/18
6	B18-10039	56741	Water	07/30/18
7	B18-10034F	56736F	Water	07/30/18
8	B18-10035F	56737F	Water	07/30/18
9	B18-10036F	56738F	Water	07/30/18
10	B18-10143F	56739F	Water	07/30/18
11	B18-10144F	56740F	Water	07/30/18
12	B18-10039F	56741F	Water	07/30/18
13	B18-10144MS	56740MS	Water	07/30/18
14	B18-10144MSD	56740MSD	Water	07/30/18
15	B18-10144DUP	56740DUP	Water	07/30/18

LDC #: 45386F4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-011 Level II Page: 2 of 3
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: C
2nd Reviewer: CL

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10144FDUP	56740FDUP	Water	07/30/18
17				
18				
19				

Notes:

LDC #: 45366F4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-12		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
QC:13-16		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti], ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45386F4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	**Sampling Date**	**Analysis Date**	**Total Time until Analysis (days)**	**Qualifier Code:** H	**Det/ND**		
All	7/30/18	9/3/18	35	J/UJ/P	ND		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45386F4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: CA
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	13/14		Sb	12	11		1-6	J/R/A (Det) LM
			Mn	55	42			J/UJ/A (Det) LM
			Ag		57			J/UJ/A (Det/ND) LM
			Al			39		J/UJ/A (Det) HD
			Fe			360		J/UJ/A (Det)
			Mn			27		J/UJ/A (Det)
			Ag			31		J/UJ/A (Det/ND)

Comments: 13/14: Al, Fe >4x

LDC #: 45386F4

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: C
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

HD

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		16		Se		0.0259 U ug/L (≤0.015)	7-12	J (UJ/A (Det.)
				Sn		0.0662 U ug/L (≤0.01)	7-12	J (UJ/A (Det./ND)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-011

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56736	Water	07/30/18
B18-10035	56737	Water	07/30/18
B18-10036	56738	Water	07/30/18
B18-10143	56739	Water	07/30/18
B18-10144	56740	Water	07/30/18
B18-10039	56741	Water	07/30/18
B18-10144MS	56740MS	Water	07/30/18
B18-10144MSD	56740MSD	Water	07/30/18
B18-10144DUP	56740DUP	Water	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Nitrate as N	42 days	2 days	R (all non-detects)	P
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Total orthophosphate as P	24 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

No field replicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-011	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in six samples.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-011

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-011

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-011

No Sample Data Qualified in this SDG

LDC #: 45386F6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-011 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56736	Water	07/30/18
2	B18-10035	56737	Water	07/30/18
3	B18-10036	56738	Water	07/30/18
4	B18-10143	56739	Water	07/30/18
5	B18-10144	56740	Water	07/30/18
6	B18-10039	56741	Water	07/30/18
7	B18-10144MS	56740MS	Water	07/30/18
8	B18-10144MSD	56740MSD	Water	07/30/18
9	B18-10144DUP	56740DUP	Water	07/30/18
10				
11				
12				

Notes:

LDC #: US386F6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-6	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:7-9	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ O&G]
9	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ TSS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386F6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CG
2nd reviewer: CH

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/30/18	9/10/18	42	J/R/P (ND)	8/23/18	24	J/R/P (Det)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 10, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-013

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56794	Water	07/31/18
B18-10038	56795	Water	07/31/18
B18-10041	56796	Water	07/31/18
B18-10179	56797	Water	07/31/18
B18-10180	56798	Water	07/31/18
B18-10181	56799	Water	07/31/18
B18-10042	56800	Water	08/01/18
B18-10085	56801	Water	08/01/18
B18-10086	56802	Water	08/01/18
B18-10087	56803	Water	08/01/18
B18-10088	56804	Water	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56792-BS1/BS2 (All samples in SDG 1807003-013)	Naphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthylene Biphenyl	67 (70-130) - - - - -	31 (70-130) 43 (70-130) 69 (70-130) 45 (70-130) 69 (70-130) 68 (70-130)	J (all detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56792-BS1/BS2 (All samples in SDG 1807003-013)	1-Methylnaphthalene Biphenyl	53 (≤30) 32 (≤30)	NA	-
56792-BS1/BS2 (B18-10041 B18-10042 B18-10085 B18-10087)	2-Methylnaphthalene	54 (≤30)	J (all detects)	P
56792-BS1/BS2 (B18-10037 B18-10038 B18-10179 B18-10180 B18-10181 B18-10086 B18-10088)	2-Methylnaphthalene	54 (≤30)	NA	-
56792-BS1/BS2 (B18-10085 B18-10086 B18-10087)	Naphthalene	73 (≤30)	J (all detects)	P
56792-BS1/BS2 (B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10088)	Naphthalene	73 (≤30)	NA	-

X. Field Replicates

No field replicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-013	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and RPD and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-013

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Naphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthylene Biphenyl	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10041 B18-10042 B18-10085 B18-10087	2-Methylnaphthalene	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10085 B18-10086 B18-10087	Naphthalene	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-013

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-013

No Sample Data Qualified in this SDG

LDC #: 45386G2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/9/19
SDG #: 1807003-013 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	SW	ccs/d
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56794	Water	07/31/18
2	B18-10038	56795	Water	07/31/18
3	B18-10041	56796	Water	07/31/18
4	B18-10179	56797	Water	07/31/18
5	B18-10180	56798	Water	07/31/18
6	B18-10181	56799	Water	07/31/18
7	B18-10042	56800	Water	08/01/18
8	B18-10085	56801	Water	08/01/18
9	B18-10086	56802	Water	08/01/18
10	B18-10087	56803	Water	08/01/18
11	B18-10088	56804	Water	08/01/18
12				
13				

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45386Fb

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: _____
2nd Reviewer: _____

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5492-BS1/BSD	S	67 (70-130)	31 (70-130)	( )	All (dots+ND)	J/UJ/A (LL)
			TTT	( )	43 (70-130)	( )		
			XXX	( )	69 ( )	( )		
			W	( )	45 ( )	( )		
			DD	( )	69 ( )	( )		
			ZZZZ	( )	68 ( )	( )		
			TTT	( )	( )	53 (<30)	(ND)	J/UJ/A (HD)
			W	( )	( )	54 ( )	(dots=3,7-8,10)	
			ZZZZ	( )	( )	36 ( )	(ND)	
			S	( )	( )	73 ( )	(dots=8-10)	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

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LDC Report# 45386G4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-013

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56794	Water	07/31/18
B18-10038	56795	Water	07/31/18
B18-10041	56796	Water	07/31/18
B18-10179	56797	Water	07/31/18
B18-10180	56798	Water	07/31/18
B18-10181	56799	Water	07/31/18
B18-10042	56800	Water	08/01/18
B18-10085	56801	Water	08/01/18
B18-10086	56802	Water	08/01/18
B18-10087	56803	Water	08/01/18
B18-10088	56804	Water	08/01/18
B18-10037F	56794F	Water	07/31/18
B18-10038F	56795F	Water	07/31/18
B18-10041F	56796F	Water	07/31/18
B18-10179F	56797F	Water	07/31/18
B18-10180F	56798F	Water	07/31/18
B18-10181F	56799F	Water	07/31/18
B18-10042F	56800F	Water	08/01/18
B18-10085F	56801F	Water	08/01/18
B18-10086F	56802F	Water	08/01/18
B18-10087F	56803F	Water	08/01/18
B18-10088F	56804F	Water	08/01/18
B18-10037MS	56794MS	Water	07/31/18
B18-10037MSD	56794MSD	Water	07/31/18
B18-10037DUP	56794DUP	Water	07/31/18
B18-10038MS	56795MS	Water	07/31/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10038MSD	56795MSD	Water	07/31/18
B18-10038DUP	56795DUP	Water	07/31/18
B18-10037FDUP	56794FDUP	Water	07/31/18
B18-10038FDUP	56795FDUP	Water	07/31/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10037F B18-10038F B18-10041F B18-10179F B18-10180F B18-10181F	Mercury	34	28	UJ (all non-detects)	P
B18-10042 B18-10085 B18-10086 B18-10087 B18-10088 B18-10042F B18-10085F B18-10086F B18-10087F B18-10088F	Mercury	33	28	UJ (all non-detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10038MS/MSD (B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088)	Antimony	7 (75-125)	7 (75-125)	J (all detects)	A

For B18-10038MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10038MS/MSD (B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088)	Aluminum	33 (≤25)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10038FDUP (B18-10038F B18-10041F B18-10179F B18-10180F B18-10181F B18-10042F B18-10085F B18-10086F B18-10087F B18-10088F)	Beryllium Cobalt Tin	- 37 (≤25) -	0.051 ug/L (≤0.01) - 0.01325 ug/L (≤0.01)	J (all detects) UJ (all non-detects)	A
B18-10038FDUP (B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088)	Tin	-	0.0169 ug/L (≤0.01)	J (all detects) UJ (all non-detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

No field replicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-013	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, DUP RPD and difference, and results reported below the RL and above the MDL, data were qualified as estimated in twenty-two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-013

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088 B18-10037F B18-10038F B18-10041F B18-10179F B18-10180F B18-10181F B18-10042F B18-10085F B18-10086F B18-10087F B18-10088F	Mercury	UJ (all non-detects)	P	Technical holding times (H)
B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Antimony	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Aluminum	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10038F B18-10041F B18-10179F B18-10180F B18-10181F B18-10042F B18-10085F B18-10086F B18-10087F B18-10088F	Beryllium Tin	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference) (HD)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10038F B18-10041F B18-10179F B18-10180F B18-10181F B18-10042F B18-10085F B18-10086F B18-10087F B18-10088F	Cobalt	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Tin	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference) (HD)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088 B18-10037F B18-10038F B18-10041F B18-10179F B18-10180F B18-10181F B18-10042F B18-10085F B18-10086F B18-10087F B18-10088F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-013

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-013

No Sample Data Qualified in this SDG

LDC #: 45386G4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-013 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: CF
2nd Reviewer: CF

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, SRM/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56794	Water	07/31/18
2	B18-10038	56795	Water	07/31/18
3	B18-10041	56796	Water	07/31/18
4	B18-10179	56797	Water	07/31/18
5	B18-10180	56798	Water	07/31/18
6	B18-10181	56799	Water	07/31/18
7	B18-10042	56800	Water	08/01/18
8	B18-10085	56801	Water	08/01/18
9	B18-10086	56802	Water	08/01/18
10	B18-10087	56803	Water	08/01/18
11	B18-10088	56804	Water	08/01/18
12	B18-10037F	56794F	Water	07/31/18
13	B18-10038F	56795F	Water	07/31/18
14	B18-10041F	56796F	Water	07/31/18
15	B18-10179F	56797F	Water	07/31/18

LDC #: 45386G4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-013 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: G
2nd Reviewer: G

METHOD: Metals (EPA Method 1640/200.8/245.7)

16	B18-10180F	56798F	Water	07/31/18
17	B18-10181F	56799F	Water	07/31/18
18	B18-10042F	56800F	Water	08/01/18
19	B18-10085F	56801F	Water	08/01/18
20	B18-10086F	56802F	Water	08/01/18
21	B18-10087F	56803F	Water	08/01/18
22	B18-10088F	56804F	Water	08/01/18
23	B18-10037MS	56794MS	Water	07/31/18
24	B18-10037MSD	56794MSD	Water	07/31/18
25	B18-10037DUP	56794DUP	Water	07/31/18
26	B18-10038MS	56795MS	Water	07/31/18
27	B18-10038MSD	56795MSD	Water	07/31/18
28	B18-10038DUP	56795DUP	Water	07/31/18
29	B18-10037FDUP	56794FDUP	Water	07/31/18
30	B18-10038FDUP	56795FDUP	Water	07/31/18
31				
32				
33				

Notes:

LDC #: US386G4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: Q

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-22		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn, Hg, Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti,] ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Q:23-25,29		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
26,28,30		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu, Fe, Pb], Mg, [✓ Mn], Hg, [✓ Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, [✓ Sn, Ti,] ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti

Comments: Mercury by CVAA if performed

LDC #: 45386G4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Code: H	Det/ND		
1-6, 12-17	7/31/18	9/3/18	34	J/UJ/P	ND		
7-11, 18-22	8/1/18	9/3/18	33	J/UJ/P	ND		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45386G4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	26/27		Sb	7	7		2-11	J/R/A (Det) (LM)
			Al			33		J/UJ/A (Det) (HD)

Comments: 26/27: Al, Fe >4x

LDC #: 45386G4G

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: CQ
2nd Reviewer: CQ

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

(HD)

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	~~mg/L~~ ug/L Difference (Limits)	Associated Samples	Qualifications
		30		Be		0.051 (≤0.01)	13-22	J (all Det) A (all ND)
				Co	37 (≤25)		↓	↓ Det
				Sn		0.01325 (≤0.01)	↓	↓ Det
		28		Sn		0.0169 (≤0.01)	2-11	J (all Det) A (all ND)

Comments: _____

DUP.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-013

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56794	Water	07/31/18
B18-10038	56795	Water	07/31/18
B18-10041	56796	Water	07/31/18
B18-10179	56797	Water	07/31/18
B18-10180	56798	Water	07/31/18
B18-10181	56799	Water	07/31/18
B18-10042	56800	Water	08/01/18
B18-10085	56801	Water	08/01/18
B18-10086	56802	Water	08/01/18
B18-10087	56803	Water	08/01/18
B18-10088	56804	Water	08/01/18
B18-10037MS	56794MS	Water	07/31/18
B18-10037MSD	56794MSD	Water	07/31/18
B18-10037DUP	56794DUP	Water	07/31/18
B18-10181MS	56799MS	Water	07/31/18
B18-10181MSD	56799MSD	Water	07/31/18
B18-10181DUP	56799DUP	Water	07/31/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181	Nitrate as N	41 days	2 days	R (all non-detects)	P
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181	Total orthophosphate as P	23 days	2 days	J (all detects)	P
B18-10085 B18-10086	Nitrate as N	40 days	2 days	J (all detects)	P
B18-10042 B18-10087 B18-10088	Nitrate as N	40 days	2 days	R (all non-detects)	P
B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Total orthophosphate as P	22 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

No field replicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-013	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in nine samples.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-013

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10087 B18-10088	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10085 B18-10086	Nitrate as N	J (all detects)	P	Technical holding times (H)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-013

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-013

No Sample Data Qualified in this SDG

LDC #: 45386G6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-013 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56794	Water	07/31/18
2	B18-10038	56795	Water	07/31/18
3	B18-10041	56796	Water	07/31/18
4	B18-10179	56797	Water	07/31/18
5	B18-10180	56798	Water	07/31/18
6	B18-10181	56799	Water	07/31/18
7	B18-10042	56800	Water	08/01/18
8	B18-10085	56801	Water	08/01/18
9	B18-10086	56802	Water	08/01/18
10	B18-10087	56803	Water	08/01/18
11	B18-10088	56804	Water	08/01/18
12	B18-10037MS	56794MS	Water	07/31/18
13	B18-10037MSD	56794MSD	Water	07/31/18
14	B18-10037DUP	56794DUP	Water	07/31/18
15	B18-10181MS	56799MS	Water	07/31/18
16	B18-10181MSD	56799MSD	Water	07/31/18
17	B18-10181DUP	56799DUP	Water	07/31/18

LDC #: U5386666

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-11	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:12-14	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS]
15-17	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386G6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CF
2nd reviewer: CF

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria? Code: H

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/31/18	9/10/18	41	J/R/P (ND)	8/23/18	23	J/R/P (Det)
7-11	8/1/18	9/10/18	40	J/R/P (Det=8)	8/23/18	22	J/R/P (Det)

LDC Report# 45386H2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 11, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-015

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57529	Water	08/14/18
B18-10043	57530	Water	08/14/18
B18-10044	57531	Water	08/14/18
B18-20043	57532	Water	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57527-BS1/BS2 (All samples in SDG 1807003-015)	Naphthalene	-	67 (70-130)	J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/L)		RPD
	B18-10043	B18-20043	
2-Methylnaphthalene	1.41	5U	Not calculable
Naphthalene	2.32	5U	Not calculable

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-015	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-015

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Naphthalene	J (all detects) UJ (all non-detects)	A	Laboratory control samples (%R) (LL)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-015

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-015

No Sample Data Qualified in this SDG

LDC #: 45386H2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/10/19
SDG #: 1807003-015 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	SW	D=2+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57529	Water	08/14/18
2	B18-10043	57530	Water	08/14/18
3	B18-10044	57531	Water	08/14/18
4	B18-20043	57532	Water	08/14/18
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45386H2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: ______
2nd Reviewer: ______

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		57527-BS1/	S	( )	67 (70-130)	( )	All (dets+ND)	J/UJ/P(LL)
		/-BS2		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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Privileged and Confidential

LDC#: 45386H-b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer:

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/L)		RPD
	2	4	
W	1.41	5U	NC
S	2.32	5U	NC

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2019\45386H2b_RHMP.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-015

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57529	Water	08/14/18
B18-10043	57530	Water	08/14/18
B18-10044	57531	Water	08/14/18
B18-20043	57532	Water	08/14/18
B18-10040F	57529F	Water	08/14/18
B18-10043F	57530F	Water	08/14/18
B18-10044F	57531F	Water	08/14/18
B18-20043F	57532F	Water	08/14/18
B18-10040MS	57529MS	Water	08/14/18
B18-10040MSD	57529MSD	Water	08/14/18
B18-10040DUP	57529DUP	Water	08/14/18
B18-10040FDUP	57529FDUP	Water	08/14/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10040MS/MSD (B18-10040 B18-10043 B18-10044 B18-20043)	Antimony Iron Tin	38 (75-125) 74 (75-125) 70 (75-125)	38 (75-125) 53 (75-125) -	J (all detects) J (all detects) J (all detects)	A
B18-10040MS/MSD (B18-10040 B18-10043 B18-10044 B18-20043)	Titanium	154 (75-125)	-	J (all detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10040MS/MSD (B18-10040 B18-10043 B18-10044 B18-20043)	Aluminum Iron Titanium	29 (≤25) 33 (≤25) 36 (≤25)	J (all detects) J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10040FDUP (B18-10040F B18-10043F B18-10044F)	Beryllium Cadmium Chromium Lead Titanium	- 37 (≤25) 92 (≤25) 62 (≤25) 100 (≤25)	0.031 ug/L (≤0.01) - - - -	J (all detects) UJ (all non-detects)	A
B18-10040DUP (B18-10040 B18-10043 B18-10044 B18-20043)	Cadmium Cobalt	35 (≤25) -	- 0.0553 ug/L (≤0.01)	J (all detects) J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
57528-LCS1/2 (All samples in SDG 1807003-015)	Manganese	53 (≤30)	J (all detects)	P

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

Samples B18-10043 and B18-20043 and samples B18-10043F and B18-20043F were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	B18-10043	B18-20043	
Aluminum	90.9	48	62
Antimony	0.128	0.116	10
Arsenic	1.61	1.83	13
Barium	15	13.9	8
Beryllium	0.005U	0.0124	Not calculable
Cadmium	0.0668	0.0445	40
Chromium	0.152	0.101	40
Cobalt	0.0733	0.0466	45
Copper	2.81	3.58	24
Iron	59.9	36.5	49
Lead	0.115	0.0582	66
Manganese	21.4	19.6	9
Molybdenum	8.43	8.74	4
Nickel	0.519	0.459	12
Selenium	0.0147	0.005U	Not calculable
Silver	0.0182	0.0131	33
Titanium	18.7	17.1	9
Vanadium	3.77	3.23	15
Zinc	2.92	3.22	10

Analyte	Concentration (ug/L)		RPD
	B18-10043F	B18-20043F	
Antimony	0.158	0.148	7
Arsenic	1.86	2.04	9
Barium	15.2	14.9	2
Beryllium	0.005U	0.0362	Not calculable
Cadmium	0.0681	0.0548	22
Chromium	0.0366	0.0214	52
Cobalt	0.0885	0.0261	109
Copper	2.59	5.43	71
Iron	0.978	1.58	Not calculable
Lead	0.0188	0.00407	129
Manganese	19.4	18.3	6
Molybdenum	8.98	9.09	1
Nickel	0.49	0.454	8
Selenium	0.005U	0.00932	Not calculable
Silver	0.031	0.024	25
Titanium	10.3	9.63	7
Vanadium	3.46	3.09	11
Zinc	2.3	3.29	35

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-015	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, DUP RPD and difference, LCS/LCSD RPD, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-015

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Antimony Iron Tin	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10040 B18-10043 B18-10044 B18-20043	Titanium	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10040 B18-10043 B18-10044 B18-20043	Aluminum Iron Titanium	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10040F B18-10043F B18-10044F	Beryllium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference) (HD)
B18-10040F B18-10043F B18-10044F	Cadmium Chromium Lead Titanium	J (all detects) J (all detects) J (all detects) J (all detects)		Duplicate sample analysis (RPD) (HD)
B18-10040 B18-10043 B18-10044 B18-20043	Cadmium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10040 B18-10043 B18-10044 B18-20043	Cobalt	J (all detects)	A	Duplicate sample analysis (difference) (HD)
B18-10040 B18-10043 B18-10044 B18-20043 B18-10040F B18-10043F B18-10044F B18-20043F	Manganese	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10040 B18-10043 B18-10044 B18-20043 B18-10040F B18-10043F B18-10044F B18-20043F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-015

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-015

No Sample Data Qualified in this SDG

LDC #: 45386H4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/18/19
SDG #: 1807003-015 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A/SW	LCS/D, SB, MB/D
XI.	Field Duplicates	SW	(2,4)(6,8)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57529	Water	08/14/18
2	B18-10043	57530	Water	08/14/18
3	B18-10044	57531	Water	08/14/18
4	B18-20043	57532	Water	08/14/18
5	B18-10040F	57529F	Water	08/14/18
6	B18-10043F	57530F	Water	08/14/18
7	B18-10044F	57531F	Water	08/14/18
8	B18-20043F	57532F	Water	08/14/18
9	B18-10040MS	57529MS	Water	08/14/18
10	B18-10040MSD	57529MSD	Water	08/14/18
11	B18-10040DUP	57529DUP	Water	08/14/18
12	B18-10040FDUP	57529FDUP	Water	08/14/18
13				

Notes:

LDC #: US366H4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-8		[✓ Al, Sb, As, Ba, Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
QC:9-12		[✓ Al, Sb, As, Ba, Be, Cd,] Ca, [✓ Cr, Co, Cu, Fe, Pb,] Mg, [✓ Mn, Hg, Ni,] K, [✓ Se, Ag,] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45386H4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	9/10		Sb	38	38		1-4	J/UJ/A (Det) LM
			Fe	74	53			J/UJ/A
			Sn	70				J/UJ/A
			Ti	157				JDet/A HM
			Al			29		J/UJ/A HD
			Fe			33		J/UJ/A
			Ti			36		J/UJ/A

Comments:

LDC #: 45386H4

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? 25

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

HD

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		12		Be		0.031 (≤0.01)	5-7	J (J/A (Be+/ND)
				Cd	37			(Det)
				Cr	92			
				Pb	62			
				Ti	100			
		11		Cd	35		1-4	J (J/A (Det)
				Co		0.0553 (≤0.01)		

Comments: _____

DUP.wpd

LDC #: 45366 HA

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	LCS/LCSD ID	Matrix	Analyte	LCS %R (limits)	LCSD %R (limits)	RPD (limits)	Associated Samples	Qualifications
	575288-LCS/2	S/2	Mn			53(≤30)	All	J/UJ/+ Jdet./P (Det.)

Comments:

LDC#: 45386H4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: C
2nd Reviewer: R

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	2	4	
Aluminum	90.9	48	62
Antimony	0.128	0.116	10
Arsenic	1.61	1.83	13
Barium	15	13.9	8
Beryllium	0.005U	0.0124	NC
Cadmium	0.0668	0.0445	40
Chromium	0.152	0.101	40
Cobalt	0.0733	0.0466	45
Copper	2.81	3.58	24
Iron	59.9	36.5	49
Lead	0.115	0.0582	66
Manganese	21.4	19.6	9
Molybdenum	8.43	8.74	4
Nickel	0.519	0.459	12
Selenium	0.0147	0.005U	NC
Silver	0.0182	0.0131	33
Titanium	18.7	17.1	9
Vanadium	3.77	3.23	15
Zinc	2.92	3.22	10

LDC#: 45386H4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/L)		RPD
	6	8	
Antimony	0.158	0.148	7
Arsenic	1.86	2.04	9
Barium	15.2	14.9	2
Beryllium	0.005U	0.0362	NC
Cadmium	0.0681	0.0548	22
Chromium	0.0366	0.0214	52
Cobalt	0.0885	0.0261	109
Copper	2.59	5.43	71
Iron	0.978	1.58	NC
Lead	0.0188	0.00407	129
Manganese	19.4	18.3	6
Molybdenum	8.98	9.09	1
Nickel	0.49	0.454	8
Selenium	0.005U	0.00932	NC
Silver	0.031	0.024	25
Titanium	10.3	9.63	7
Vanadium	3.46	3.09	11
Zinc	2.3	3.29	35

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-015

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57529	Water	08/14/18
B18-10043	57530	Water	08/14/18
B18-10044	57531	Water	08/14/18
B18-20043	57532	Water	08/14/18
B18-10040MS	57529MS	Water	08/14/18
B18-10040MSD	57529MSD	Water	08/14/18
B18-10040DUP	57529DUP	Water	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10040 B18-10043 B18-10044 B18-20043	Nitrate as N	27 days	2 days	R (all non-detects)	P
B18-10040 B18-10043 B18-10044 B18-20043	Total orthophosphate as P	9 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	B18-10043	B18-20043	
Ammonia as N	0.0165	0.021	24
Dissolved organic carbon	2.26	2.25	0
Methylene blue active substances	0.0287	0.0201	35
Total organic carbon	2.78	2.53	9
Total orthophosphate as P	0.0518	0.0485	7
Total suspended solids	3.04	3.46	13

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-015	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in four samples.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-015

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Nitrate as N	R (all non-detects)	P	Technical holding times (H)
B18-10040 B18-10043 B18-10044 B18-20043	Total orthophosphate as P	J (all detects)	P	Technical holding times (H)
B18-10040 B18-10043 B18-10044 B18-20043	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-015

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-015

No Sample Data Qualified in this SDG

LDC #: 45386H6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19
SDG #: 1807003-015 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	(2,4)
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57529	Water	08/14/18
2	B18-10043	57530	Water	08/14/18
3	B18-10044	57531	Water	08/14/18
4	B18-20043	57532	Water	08/14/18
5	B18-10040MS	57529MS	Water	08/14/18
6	B18-10040MSD	57529MSD	Water	08/14/18
7	B18-10040DUP	57529DUP	Water	08/14/18
8				
9				
10				
11				

Notes:

LDC #: 45386H6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: Q

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC57	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386H6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: G
2nd reviewer: Q

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria? Code: H

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	8/14/18	9/10/18	27	J/R/P (ND)	8/23/18	9	J/R/P (Det)

LDC#: 45386H6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/L)		RPD
	2	4	
Ammonia as N	0.0165	0.021	24
DOC	2.26	2.25	0
MBAS	0.0287	0.0201	35
TOC	2.78	2.53	9
Total orthophosphate as P	0.0518	0.0485	7
TSS	3.04	3.46	13

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45386H6.wpd

LDC Report# 45386I2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 10, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-017

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58089	Water	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
58087-BS1 (All samples in SDG 1807003-017)	Benzo(b)fluoranthene	136 (70-130)	139 (70-130)	NA	-
58087-BS1 (All samples in SDG 1807003-017)	Naphthalene	-	131 (70-130)	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

X. Field Replicates

No field replicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-017	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-017

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	Naphthalene	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-017

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-017

No Sample Data Qualified in this SDG

LDC #: 45386I2b

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 7/9/19

SDG #: 1807003-017

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: 9

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58089	Water	09/12/18
2				
3				
4				
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 15386I2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer: ______

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications (H)
		68087-BS1	GGG	136 (70-130)	139 (70-130)	( )	All (ND)	J dets/P
			S	( )	131 (✓)	( )	(dets)	✓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-017

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58089	Water	09/12/18
B18-10200F	58089F	Water	09/12/18

Samples appended with "F" were analyzed for dissolved metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Titanium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 1640 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10040MS/MSD (B18-10200)	Antimony Iron Tin	38 (75-125) 74 (75-125) 70 (75-125)	38 (75-125) 53 (75-125) -	J (all detects) J (all detects) J (all detects)	A
B18-10040MS/MSD (B18-10200)	Titanium	154 (75-125)	-	J (all detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10040MS/MSD (B18-10200)	Aluminum Iron Titanium	29 (≤25) 33 (≤25) 36 (≤25)	J (all detects) J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10040FDUP (B18-10200F)	Beryllium Cobalt Tin	- 37 (≤25) -	0.051 ug/L (≤0.01) - 0.01325 ug/L (≤0.01)	J (all detects) UJ (all non-detects)	A
B18-10040DUP (B18-10200F)	Tin	-	0.0169 ug/L (≤0.01)	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
57528-LCS1/2 (All samples in SDG 1807003-017)	Manganese	53 (≤30)	J (all detects)	P

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Replicates

No field replicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-017	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, DUP RPD and difference, LCS/LCSD RPD, and results reported below the RL and above the MDL, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-017

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10200	Antimony Iron Tin	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10200	Titanium	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10200	Aluminum Iron Titanium	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10200F	Beryllium Tin	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference) (HD)
B18-10200F	Cobalt	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10200F	Tin	J (all detects)	A	Duplicate sample analysis (difference) (HD)
B18-10200 B18-10200F	Manganese	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10200 B18-10200F	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-017

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-017

No Sample Data Qualified in this SDG

LDC #: 45386l4a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19

SDG #: 1807003-017 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: G

2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 1640/200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, SW, A	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A, SW	LCS/D, SRM/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58089	Water	09/12/18
2	B18-10200F	58089F	Water	09/12/18
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

LDC #45386I4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1,2		[✓ Al, Sb, As, Ba, Be, Cd] Ca, [✓ Cr, Co, Cu, Fe, Pb] Mg, [✓ Mn, Hg, Ni] K, [✓ Se, Ag] Na, [✓ Tl, V, Zn, Mo,] B, [✓ Sn, Ti,] ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___

Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45386H4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	~~B18-10038MS/MSD~~		Sb	38	38		1	J/UJ/A (Det) LM
	~~(SDG: 1807003-013)~~		Fe	74	53			J/UJ/A
	B18-10040 MS/D		Sn	70				J/UJ/A
	(1807003-015)		Ti	157				JDet/A HM
			Al			29		J/UJ/A HD
			Fe			33		J/UJ/A
			Ti			36		J/UJ/A

Comments:

LDC #: 45358H4a
I

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG? 25

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

TD

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits) (SL)	Associated Samples	Qualifications
		BL8-100388FD4P		Be		0.051 (≤0.01)	2	J (LOQ / MDL)
		40		Co	37			Det
				Sn		0.01325 (≤0.01)		Det
		BL8-100388DLP		Sn		0.0169 (≤0.01)	2	J (LOQ / MDL)
		40						Det

Comments: from 807003-015

LDC #: 45366I4a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: G
2nd Reviewer: Q

METHOD: Inorganics, Method _____

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	LCS/LCSD ID	Matrix	Analyte	LCS %R (limits)	LCSD %R (limits)	RPD (limits)	Associated Samples	Qualifications
	500885-LCS1/2		Mn			53	All	J det (P (Det)

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: July 16, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-017

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58089	Water	09/12/18
B18-10200MS	58089MS	Water	09/12/18
B18-10200MSD	58089MSD	Water	09/12/18
B18-10200DUP	58089DUP	Water	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Dissolved Organic Carbon by Standard Method 5310B
Methylene Blue Active Substances by Standard Method 5540C
Nitrate as Nitrogen by Standard Method 4500-NO3-E
Oil and Grease by Environmental Protection Agency (EPA) Method 1664B
Total Orthophosphate as Phosphorus by Standard Method 4500-P-E
Total Organic Carbon by Standard Method 5310B
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10200	Nitrate as N	21 days	2 days	J (all detects)	P

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

No field replicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-017	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-017

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10200	Nitrate as N	J (all detects)	P	Technical holding times (H)
B18-10200	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-017

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-017

No Sample Data Qualified in this SDG

LDC #: 45386I6 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/15/19

SDG #: 1807003-017 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), DOC SM 5310 B), MBAS (SM 5540 C), Nitrate as N (SM 4500-NO3 E), Oil & Grease (EPA Method 1664B), Total Orthophosphate as P (SM 4500-P E), TOC (SM 5310 B), TSS (SM 2540 D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58089	Water	09/12/18
2	B18-10200MS	58089MS	Water	09/12/18
3	B18-10200MSD	58089MSD	Water	09/12/18
4	B18-10200DUP	58089DUP	Water	09/12/18
5				
6				
7				
8				
9				
10				
11				

Notes:

LDC #: 45386I6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: q

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS] [✓ TSS] [✓ O&G]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:2-4	pH TDS Cl F [✓ NO_3] NO_2 SO_4 [✓ O-PO_4] Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ DOC] [✓ MBAS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45386I6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria? Code: H

Method:		SM4500 NO3-E			SM4500 P-E		
Parameters:		Nitrate as N			Total orthophosphate as P		
Technical holding time:		2 days			2 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	9/12/18	10/3/18	21	J/R/P (Det)			

LDC #: 45386

EDD POPULATION COMPLETENESS WORKSHEET

Date: 7/23
Page: 1 of 1
2nd Reviewer: CJ

The LDC job number listed above was entered by JE.
Entered from Body or Summary

	EDD Process		Comments/Action
I.	EDD Completeness	-	
Ia.	- All methods present?	Y	
Ib.	- All samples present/match report?	Y	
Ic.	- All reported analytes present?	Y	
Id.	- 10% or 100% verification of EDD?	Y	
II.	EDD Preparation/Entry	-	
IIa.	- Carryover U/J?	J	DL
IIb.	- Reason Codes used? If so, note which codes.	Y	
IIc.	- Additional Information (QC Level, Validator, Validated Y/N, etc.)	—	
III.	Reasonableness Checks	-	
IIIa.	- Do all qualified ND results have ND qualifier (e.g. UJ)?	Y	
IIIb.	- Do all qualified detect results have detect qualifier (e.g. J)?	Y	
IIIc.	- If reason codes are used, do all qualified results have reason code field populated, and vice versa?	Y	
IIId.	-Does the detect flag require changing for blank qualifier? If so, are all U results marked ND?	+	
IIIe.	- Do blank concentrations in report match EDD where data was qualified due to blank contamination?	Y	
IIIf.	- Were multiple results reported due to dilutions/reanalysis? If so, were results qualified appropriately?	+	
IIIg.	-Are there any discrepancies between the data packet and the EDD?	N	

Notes: *see discrepancy sheet

Sediment

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Wood Environment & Infrastructure
9210 Sky Park Ct
San Diego, CA 92123
Attn: Ms. Corey Sheredy
corey.sheredy@woodplc.com

June 6, 2019

SUBJECT: 2018 Regional Harbor Monitoring Program, Data Validation

Dear Ms. Sheredy

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 22, 2019. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #45128

SDG #	Fraction
1807003-002, 1807003-004 1807003-006, 1807003-008 1807003-010, 1807003-012 1807003-014, 1807003-016 1807003-018, 1807003-019	Polynuclear Aromatic Hydrocarbons, Polybrominated Diphenyl Ethers, Fipronil & Degradates, Synthetic Pyrethroid Pesticides, Chlorinated Pesticides, Polychlorinated Biphenyls as Congeners, Metals, Wet Chemistry

The data validation was performed under Level II guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California; June 2018
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review; January 2017
- USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review; January 2017
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

Level II Client Select

LDC #45128 (Wood Environment & Infrastructure Solutions-San Diego, CA / 2018 Regional Harbor Monitoring Program)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270D)		PBDE (8270D/ -NCI)		Fipronil. Degra. (8270D -NCI/)		Pyre. Pets. (8270D -MRM)		Pest. (8270D)		PCBs as Cong. (8270D)		Metals (6020)		Hg (245.7)		SEM Metals (200.8)		AVS (1981)		NH_3-N (4500D)		Part. Size (2560D)		% Solids (2540B)		Total N. (9060)		TOC (9060)					
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	T	S	T	S
A	1807003-002	05/22/19	06/13/19	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4				
B	1807003-004	05/22/19	06/13/19	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13	0	13				
C	1807003-006	05/22/19	06/13/19	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10				
D	1807003-008	05/22/19	06/13/19	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17				
E	1807003-010	05/22/19	06/13/19	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12	0	12				
F	1807003-012	05/22/19	06/13/19	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6				
G	1807003-014	05/22/19	06/13/19	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	11				
H	1807003-016	05/22/19	06/13/19	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4				
I	1807003-018	05/22/19	06/13/19	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1				
Total	J/PG			0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	78	0	0	0	1170

Level II Client Select

LDC #45128 (Wood Environment & Infrastructure Solutions-San Diego, CA / 2018 Regional Harbor Monitoring Program)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (625)		PBDE (625 -NCI)		Fipronil. Degra. (625 -NCI/)		Pyre. Pest. (625- MRM)		Pest. (625)		PCBs as Cong. (625)		Metals (200.8/ 245.7)		NH_3-N (4500D)		TOC (5310B)		NO3-N NO2-N (300.0)		P. (4500 PE)		TSS (2540D)											
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	T	S	T	S
J	1807003-019	05/22/19	06/13/19	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0										
Total	J/PG			1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	12

Shaded cells indicate Level IV validation (all other cells are Level II review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56375-BS1/BS2 (All samples in SDG 1807003-002)	1-Methylnaphthalene	49 (70-130)	53 (70-130)	J (all detects)	P
	2,6-Dimethylnaphthalene	59 (70-130)	60 (70-130)	J (all detects)	
	2-Methylnaphthalene	50 (70-130)	53 (70-130)	J (all detects)	
	Acenaphthene	60 (70-130)	61 (70-130)	J (all detects)	
	Acenaphthylene	59 (70-130)	61 (70-130)	J (all detects)	
	Biphenyl	55 (70-130)	57 (70-130)	J (all detects)	
	Naphthalene	41 (70-130)	46 (70-130)	J (all detects)	
56375-BS1/BS2 (All samples in SDG 1807003-002)	Benzo(a)anthracene	149 (70-130)	146 (70-130)	J (all detects)	P
	Indeno(1,2,3-cd)pyrene	131 (70-130)	-	J (all detects)	

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
SRM 1944	2-Methylnaphthalene	56 (60-140)	All samples in SDG 1807003-002	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-002

Sample	Compound	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Biphenyl Naphthalene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10065 B18-10066 B18-10067 B18-10068	Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10065 B18-10066 B18-10067 B18-10068	2-Methylnaphthalene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-002

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples /CRM	AW/SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
5				
6				
7				
8				

Notes:

	0-2100 8						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 43-88A-b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SB3[5-BS1/	TTT	49 (70-130)	53 (70-131)	( )	All (soils)	J/UJ/P (LL)
		-BS2	XXX	59 ( )	60 ( )	( )		
			W	50 ( )	53 ( )	( )		
			~~44~~	60 ( )	61 ( )	( )		
			DD	59 ( )	61 ( )	( )		
			ZZZZ	55 ( )	57 ( )	( )		
			S	41 ( )	46 ( )	( )		
			CCC	149 ( )	146 ( )	( )		J (all dets)/P (HL)
			VVV	131 ( )	( )	( )		
				( )	( )	( )		
		SRM1944	W	56 (60-140)	( )	( )	All (soils)	J/UJ/A (LL)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56375-BS1/BS2 (All samples in SDG 1807003-002)	PBDE 190	59 (70-130)	66 (70-130)	J (all detects) UJ (all non-detects)	P
	PBDE 209	23 (70-130)	25 (70-130)	J (all detects) UJ (all non-detects)	

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-002

Sample	Compound	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	PBDE 190 PBDE 209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A2c

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-002

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/9/19
Page: 1 of 1
Reviewer: 2
2nd Reviewer: JVC

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples LCSD	SW/A	LCS/D. LCSD
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
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Notes:

	0-21008						

LDC #: 45128A2c

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		563T5-BS1/	PBDE190	59 (70-130)	66 (70-130)	( )	All (dets+ND)	J/UJ/P (LL)
		-BS2	↓ 209	23 (↓)	25 (↓)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-002

Sample	Compound	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A2d

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-002

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 1 of 1

Reviewer: Q

2nd Reviewer: JW

METHOD: GC/MS Fipronil & Degradates(EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
5				
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-002

Sample	Compound	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A2e

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-002

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/9/19

Page: 1 of 1

Reviewer: CF

2nd Reviewer: JRG

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
5				
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56375-BS1/BS2 (All samples in SDG 1807003-002)	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	55 (70-130) 12 (70-130) 37 (70-130) 12 (70-130)	51 (70-130) 14 (70-130) 40 (70-130) 13 (70-130)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
56375-BS1/BS2 (All samples in SDG 1807003-002)	Methoxychlor	150 (70-130)	150 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-002

Sample	Compound	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A3a

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/9/19

SDG #: 1807003-002

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: Q

2nd Reviewer: QC

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	TW/A	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
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Notes:

	0-21008						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45128A3a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
[✓ Y] N N/A Was a LCS required?
Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		563T5-BS1/	Dicofol	55 (70-130)	51 (70-130)	( )	All (ND)	J/UJ/P(L)
		-BS2	H	12 ( )	14 ( )	( )		
			L	37 ( )	40 ( )	( )		
			R	12 ( )	13 ( )	( )		
			P	150 ( )	150 ( )	( )		J dets/P(H)
				( )	( )	( )		
				( )	( )	( )		
		~~563TT-CRM~~		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
SRM 1944	PCB-105 PCB-118 PCB-128 PCB-156 PCB-206	35 (60-140) 56 (60-140) 19 (60-140) 28 (60-140) 53 (60-140)	All samples in SDG 1807003-002	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to CRM %R and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-002

Sample	Compound	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	PCB-105 PCB-118 PCB-128 PCB-156 PCB-206	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10065 B18-10066 B18-10067 B18-10068	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-002

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 1 of 1

Reviewer: CY

2nd Reviewer: JVG

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples/CRM1	A FW	LCS/D, CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
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Notes:

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LDC #: 45P8A3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SRM 1944	PCB105	35 (60-140)	( )	( )	All (dets+ND)	J/UJ/A (+P)
			118	56 ( )	( )	( )		
			128	19 ( )	( )	( )		
			156	28 ( )	( )	( )		
			206	53 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18
B18-10065(SEM)	56380(SEM)	Sediment	07/10/18
B18-10066(SEM)	56381(SEM)	Sediment	07/10/18
B18-10067(SEM)	56382(SEM)	Sediment	07/10/18
B18-10068(SEM)	56383(SEM)	Sediment	07/10/18
B18-10065MS	56380MS	Sediment	07/10/18
B18-10065MSD	56380MSD	Sediment	07/10/18
B18-10065DUP	56380DUP	Sediment	07/10/18
B18-10065MS(SEM)	56380MS(SEM)	Sediment	07/10/18
B18-10065MSD(SEM)	56380MSD(SEM)	Sediment	07/10/18
B18-10065DUP(SEM)	56380DUP(SEM)	Sediment	07/10/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10065 B18-10066 B18-10067 B18-10068	Mercury	182	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10065MS/MSD (All samples in SDG 1807703-002)	Chromium Barium	131 (75-125) -	135 (75-125) 127 (75-125)	J (all detects) J (all detects)	A

For B18-10065MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10065MS/MSD (All samples in SDG 1807703-002)	Iron	32 (≤25)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10065DUP (All samples in SDG 1807003-002)	Chromium	52 (≤25)	-	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-002

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	Mercury	J (all detects)	P	Technical holding times (H)
B18-10065 B18-10066 B18-10067 B18-10068	Chromium Barium	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10065 B18-10066 B18-10067 B18-10068	Iron	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10065 B18-10066 B18-10067 B18-10068	Chromium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10065 B18-10066 B18-10067 B18-10068 B18-10065(SEM) B18-10066(SEM) B18-10067(SEM) B18-10068(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A4a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-002 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: CA
2nd Reviewer: CA

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, CRM
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
5	B18-10065(SEM)	56380(SEM)	Sediment	07/10/18
6	B18-10066(SEM)	56381(SEM)	Sediment	07/10/18
7	B18-10067(SEM)	56382(SEM)	Sediment	07/10/18
8	B18-10068(SEM)	56383(SEM)	Sediment	07/10/18
9	B18-10065MS	56380MS	Sediment	07/10/18
10	B18-10065MSD	56380MSD	Sediment	07/10/18
11	B18-10065DUP	56380DUP	Sediment	07/10/18
12	B18-10065MS(SEM)	56380MS(SEM)	Sediment	07/10/18
13	B18-10065MSD(SEM)	56380MSD(SEM)	Sediment	07/10/18
14	B18-10065DUP(SEM)	56380DUP(SEM)	Sediment	07/10/18
15				

LDC #: 45128A6a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-4		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
5-8		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC:9-11		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
12-14		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 45128A4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-4	7/10/18	1/8/19	182	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128A4

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: S
2nd Reviewer: Q

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ~~20%~~ 25 for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	9/10		Cr	131	135		All	JdetA (Det) (HM)
			Ba		127		↓	↓
			Fe			32	↓	JUJA (HQ)

Comments: 9/10: Al, Fe J/X

MS-MSD.wpd

LDC #: 45128A4a

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ~~≤ 20% for water samples and ≤ 35%~~ (25) for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		11		Cr	52 (≤25)		All	J/UJ/A (Det) HD

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-002

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10065	56380	Sediment	07/10/18
B18-10066	56381	Sediment	07/10/18
B18-10067	56382	Sediment	07/10/18
B18-10068	56383	Sediment	07/10/18
B18-10065MS	56380MS	Sediment	07/10/18
B18-10065MSD	56380MSD	Sediment	07/10/18
B18-10065DUP	56380DUP	Sediment	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
All samples in SDG 1807003-002	Acid volatile sulfide	178 days	14 days	J (all detects)	A
All samples in SDG 1807003-002	Ammonia as N	177 days	28 days	J (all detects)	A
All samples in SDG 1807003-002	Total nitrogen	184 days	28 days	J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10065MS/MSD (All samples in SDG 1807703-012)	Acid volatile sulfide	42 (80-120)	40 (80-120)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-002	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-002

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10065 B18-10066 B18-10067 B18-10068	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10065 B18-10066 B18-10067 B18-10068	Acid volatile sulfide	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10065 B18-10066 B18-10067 B18-10068	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-002

No Sample Data Qualified in this SDG

LDC #: 45128A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19

SDG #: 1807003-002 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]

2nd Reviewer: [illegible]

-NH3 D

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCSD, CRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10065	56380	Sediment	07/10/18
2	B18-10066	56381	Sediment	07/10/18
3	B18-10067	56382	Sediment	07/10/18
4	B18-10068	56383	Sediment	07/10/18
5	~~1 MS~~			
6	~~MSD~~ ~~MS2~~ MSD			
7	DUP			
8				
9				
10				

Notes:

LDC #: 45128A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ %Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC-5,6	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4 [✓ AVS]
7	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4 [✓ AVS] [✓ %Solids] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

CH1

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	7/10/18	1/4/19	178	J/R/A (Det)	1/3/19	177	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	7/10/18				1/10/19	184	J/R/A (Det)

LDC #: 45128A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: CA
2nd Reviewer: CA

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the QAPP limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) within QAPP limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	5/6		AVS	42 (80-120)	40		All	J/UJ/A (Det) (CLM)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56375-BS1/BS2 (All samples in SDG 1807003-004)	1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Biphenyl Naphthalene	49 (70-130) 59 (70-130) 50 (70-130) 60 (70-130) 59 (70-130) 55 (70-130) 41 (70-130)	53 (70-130) 60 (70-130) 53 (70-130) 61 (70-130) 61 (70-130) 57 (70-130) 46 (70-130)	J (all detects) UJ (all non-detects)	P
56375-BS1/BS2 (All samples in SDG 1807003-004)	Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	149 (70-130) 131 (70-130)	146 (70-130) -	J (all detects) J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
SRM 1944	2-Methylnaphthalene	56 (60-140)	All samples in SDG 1807003-004	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-004

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Biphenyl Naphthalene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	2-Methylnaphthalene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-004

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JVG

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples /CRM	W/SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
4	B18-10020	56420	Sediment	07/12/18
5	B18-10073	56421	Sediment	07/12/18
6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: ~~45-883~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		563/5-BS1	TTT	49 (70-130)	53 (70-130)	( )	All (dets+ND)	J/UJ/A (LL)
			XXX	59 ( )	60 ( )	( )		
			W	52 ( )	53 ( )	( )		
			~~44~~	60 ( )	61 ( )	( )		
			DD	59 ( )	61 ( )	( )		
			ZZZZ	55 ( )	57 ( )	( )		
			S	41 ( )	46 ( )	( )		
			CCC	149 ( )	146 ( )	( )		J dets/A (HL)
			VVV	131 ( )	( )	( )		
				( )	( )	( )		
		SRM 1944	W	56 (60-140)	( )	( )	All dets	J/UJ/A (LL)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56375-BS1/BS2 (All samples in SDG 1807003-004)	PBDE 190	59 (70-130)	66 (70-130)	J (all detects) UJ (all non-detects)	P
	PBDE 209	23 (70-130)	25 (70-130)	J (all detects) UJ (all non-detects)	

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-004

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	PBDE 190 PBDE 209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B2c

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-004

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 8/29/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JVL

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	M/A	LCS/D.
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
4	B18-10020	56420	Sediment	07/12/18
5	B18-10073	56421	Sediment	07/12/18
6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18

LDC #: 45128A2c

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVL

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		563T5-BS1/	PBDE190	59 (70-130)	66 (70-130)	( )	All (dets+ND)	J/UJ/P (LL)
		-BS2	↓ 209	23 (↓)	25 (↓)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-004

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B2d

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-004

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 9/9/19

Page: 1 of 1

Reviewer: Q

2nd Reviewer: [illegible]

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
4	B18-10020	56420	Sediment	07/12/18
5	B18-10073	56421	Sediment	07/12/18
6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-004

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B2e **VALIDATION COMPLETENESS WORKSHEET** Date: 8/29/19
SDG #: 1807003-004 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JVE

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
4	B18-10020	56420	Sediment	07/12/18
5	B18-10073	56421	Sediment	07/12/18
6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56375-BS1/BS2 (All samples in SDG 1807003-004)	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	55 (70-130) 12 (70-130) 37 (70-130) 12 (70-130)	51 (70-130) 14 (70-130) 40 (70-130) 13 (70-130)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
56375-BS1/BS2 (All samples in SDG 1807003-004)	Methoxychlor	150 (70-130)	150 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-004

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B3a

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-004

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 8/9/19

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N/A	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples LCSD	N/A	LCS/D. LCSD
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
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6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: ~~15128~~39

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56375-BS1	Dicofol	~~56~~ 55 (70-130)	51 (70-130)	( )	All (ND)	J/UJ/P (LL)
		-BS2	H	12 (↓)	14 (↓)	( )		↓
			L	37 ( )	40 ( )	( )		
			R	12 ( )	13 ( )	( )		
			P	150 ( )	150 ( )	( )		J dets/P (HL)
				( )	( )	( )		
				( )	( )	( )		
		~~56377-BLK~~		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
SRM 1944	PCB-105 PCB-118 PCB-128 PCB-156 PCB-206	35 (60-140) 56 (60-140) 19 (60-140) 28 (60-140) 53 (60-140)	All samples in SDG 1807003-004	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to CRM %R and results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-004

Sample	Compound	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	PCB-105 PCB-118 PCB-128 PCB-156 PCB-206	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-004

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples CRM	A SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
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6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18

LDC #: 15128B36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SRM 1944	PCB105	35 (60-140)	( )	( )	All (det + ND)	J/UJ/A (LP)
			118	56 ( )	( )	( )		
			128	19 ( )	( )	( )		
			156	28 ( )	( )	( )		
			206	53 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
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				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
B18-10016	56418	Sediment	07/12/18
B18-10438 (overdraw)	56419	Sediment	07/12/18
B18-10020	56420	Sediment	07/12/18
B18-10073	56421	Sediment	07/12/18
B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18
B18-10015(SEM)	56417(SEM)	Sediment	07/12/18
B18-10016(SEM)	56418(SEM)	Sediment	07/12/18
B18-10438 (overdraw)(SEM)	56419(SEM)	Sediment	07/12/18
B18-10020(SEM)	56420(SEM)	Sediment	07/12/18
B18-10073(SEM)	56421(SEM)	Sediment	07/12/18
B18-10074(SEM)	56422(SEM)	Sediment	07/12/18
B18-10075(SEM)	56423(SEM)	Sediment	07/12/18
B18-10017(SEM)	56424(SEM)	Sediment	07/13/18
B18-10019(SEM)	56425(SEM)	Sediment	07/13/18
B18-10069(SEM)	56426(SEM)	Sediment	07/11/18
B18-10070(SEM)	56427(SEM)	Sediment	07/11/18
B18-10071(SEM)	56428(SEM)	Sediment	07/11/18
B18-10072(SEM)	56429(SEM)	Sediment	07/11/18
B18-10020MS	56420MS	Sediment	07/12/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10020MSD	56420MSD	Sediment	07/12/18
B18-10020DUP	56420DUP	Sediment	07/12/18
B18-10020MS(SEM)	56420MS(SEM)	Sediment	07/12/18
B18-10020MSD(SEM)	56420MSD(SEM)	Sediment	07/12/18
B18-10020DUP(SEM)	56420DUP(SEM)	Sediment	07/12/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Mercury	180	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For B18-10020MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10020DUP (B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072)	Cadmium	28 (≤25)	-	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in twenty-six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-004

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Mercury	J (all detects)	P	Technical holding times (H)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Cadmium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072 B18-10015(SEM) B18-10016(SEM) B18-10438 (overdraw)(SEM) B18-10020(SEM) B18-10073(SEM) B18-10074(SEM) B18-10075(SEM) B18-10017(SEM) B18-10019(SEM) B18-10069(SEM) B18-10070(SEM) B18-10071(SEM) B18-10072(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B4a

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

SDG #: 1807003-004

Page: 1 of 2

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: CE

2nd Reviewer: CE

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	27/28: Al, Fe, K
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, CRM
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
4	B18-10020	56420	Sediment	07/12/18
5	B18-10073	56421	Sediment	07/12/18
6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18
14	B18-10015(SEM)	56417(SEM)	Sediment	07/12/18
15	B18-10016(SEM)	56418(SEM)	Sediment	07/12/18

LDC #: 45128B4a

SDG #: 1807003-004

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

Reviewer: CQ

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10438 (overdraw)(SEM)	56419(SEM)	Sediment	07/12/18
17	B18-10020(SEM)	56420(SEM)	Sediment	07/12/18
18	B18-10073(SEM)	56421(SEM)	Sediment	07/12/18
19	B18-10074(SEM)	56422(SEM)	Sediment	07/12/18
20	B18-10075(SEM)	56423(SEM)	Sediment	07/12/18
21	B18-10017(SEM)	56424(SEM)	Sediment	07/13/18
22	B18-10019(SEM)	56425(SEM)	Sediment	07/13/18
23	B18-10069(SEM)	56426(SEM)	Sediment	07/11/18
24	B18-10070(SEM)	56427(SEM)	Sediment	07/11/18
25	B18-10071(SEM)	56428(SEM)	Sediment	07/11/18
26	B18-10072(SEM)	56429(SEM)	Sediment	07/11/18
27	B18-10020MS	56420MS	Sediment	07/12/18
28	B18-10020MSD	56420MSD	Sediment	07/12/18
29	B18-10020DUP	56420DUP	Sediment	07/12/18
30	B18-10020MS(SEM)	56420MS(SEM)	Sediment	07/12/18
31	B18-10020MSD(SEM)	56420MSD(SEM)	Sediment	07/12/18
32	B18-10020DUP(SEM)	56420DUP(SEM)	Sediment	07/12/18
33				
34				
35				

Notes:

LDC #: 45128B3a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-13		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
14-26		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
QC27-29		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
30-32		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128B4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CF
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

(H)

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-13	7/12/18	1/8/19	180	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128B4a

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 25% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		29		Cd	28		1-13	J/UJ/A (Det) (HD)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-004

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10015	56417	Sediment	07/12/18
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B18-10074	56422	Sediment	07/12/18
B18-10075	56423	Sediment	07/12/18
B18-10017	56424	Sediment	07/13/18
B18-10019	56425	Sediment	07/13/18
B18-10069	56426	Sediment	07/11/18
B18-10070	56427	Sediment	07/11/18
B18-10071	56428	Sediment	07/11/18
B18-10072	56429	Sediment	07/11/18
B18-10015DUP	56417DUP	Sediment	07/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10015	Acid volatile sulfide	176 days	14 days	J (all detects)	A
B18-10016	Ammonia as N	175 days	28 days	J (all detects)	
B18-10438 (overdraw)	Total nitrogen	182 days	28 days	J (all detects)	
B18-10020					
B18-10073					
B18-10074					
B18-10075					
B18-10017					
B18-10019					
B18-10069					
B18-10070					
B18-10071					
B18-10072					

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10015DUP (All samples in SDG 1807003-004)	Grain size: Phi 1.5	44 (≤20)	J (all detects)	A

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-004	Analytes reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-004

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Grain size: Phi 1.5	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10015 B18-10016 B18-10438 (overdraw) B18-10020 B18-10073 B18-10074 B18-10075 B18-10017 B18-10019 B18-10069 B18-10070 B18-10071 B18-10072	Analytes reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-004

No Sample Data Qualified in this SDG

LDC #: 45128B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-004 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500Ø-NH3 D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	CS
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	A	LCS/D, CRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10015	56417	Sediment	07/12/18
2	B18-10016	56418	Sediment	07/12/18
3	B18-10438 (overdraw)	56419	Sediment	07/12/18
4	B18-10020	56420	Sediment	07/12/18
5	B18-10073	56421	Sediment	07/12/18
6	B18-10074	56422	Sediment	07/12/18
7	B18-10075	56423	Sediment	07/12/18
8	B18-10017	56424	Sediment	07/13/18
9	B18-10019	56425	Sediment	07/13/18
10	B18-10069	56426	Sediment	07/11/18
11	B18-10070	56427	Sediment	07/11/18
12	B18-10071	56428	Sediment	07/11/18
13	B18-10072	56429	Sediment	07/11/18
14	B18-10015DUP	56417DUP	Sediment	07/12/18
15				
16				
17				

LDC #: 45128B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-13	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ %Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:14	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128B6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

(H)

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	7/12/18	1/4/19	176	J/R/A (Det)	1/3/19	175	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	7/12/18				1/10/19	182	J/R/A (Det)

LDC #: 45178B36

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: G
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cal

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		14		Grain Size: Phi 1.5	44 (≤20)		All	J/UJ/A (Det) (HD)

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	48 (50-150) 48 (50-150) 37 (50-150)	47 (50-150) 47 (50-150) 32 (50-150)	J (all detects) J (all detects) J (all detects)	A
B18-10023MS/MSD (B18-10023)	Benzo(a)anthracene	154 (50-150)	154 (50-150)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10023DUP (B18-10023)	Acenaphthene	92 (≤25)	NA	-
B18-10023DUP (B18-10023)	Benzo(a)pyrene Benzo(e)pyrene Benzo(k)fluoranthene Chrysene Fluoranthene Pyrene	34 (≤25) 26 (≤25) 26 (≤25) 27 (≤25) 43 (≤25) 42 (≤25)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20646-BS1/BS2 (B18-10023 B18-10030 B18-10078)	1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Biphenyl Naphthalene	49 (70-130) 59 (70-130) 50 (70-130) 60 (70-130) 59 (70-130) 55 (70-130) 41 (70-130)	53 (70-130) 60 (70-130) 53 (70-130) 61 (70-130) 61 (70-130) 57 (70-130) 46 (70-130)	J (all detects) UJ (all non-detects)	P
20646-BS1/BS2 (B18-10023 B18-10030 B18-10078)	Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	149 (70-130) 131 (70-130)	146 (70-130) -	J (all detects) J (all detects)	P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	1-Methylnaphthalene 2-Methylnaphthalene Biphenyl Naphthalene 2,6-Dimethylnaphthalene Acenaphthene	59 (70-130) 61 (70-130) 64 (70-130) 48 (70-130) - -	54 (70-130) 55 (70-130) 60 (70-130) 42 (70-130) 65 (70-130) 67 (70-130)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Fluoranthene	171 (70-130) 131 (70-130) 139 (70-130) - -	171 (70-130) 135 (70-130) 144 (70-130) 134 (70-130) 131 (70-130)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
20647-CRM (SRM 1994)	2-Methylnaphthalene	56 (60-140)	B18-10023 B18-10030 B18-10078	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, DUP RPD, LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-006

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023	1-Methylnaphthalene 2-Methylnaphthalene Naphthalene	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023	Benzo(a)anthracene	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10023	Benzo(a)pyrene Benzo(e)pyrene Benzo(k)fluoranthene Chrysene Fluoranthene Pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10023 B18-10030 B18-10078	1-Methylnaphthalene 2,6-Dimethylnaphthalene 2-Methylnaphthalene Acenaphthene Acenaphthylene Biphenyl Naphthalene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10023 B18-10030 B18-10078	Benzo(a)anthracene Indeno(1,2,3-cd)pyrene	J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	1-Methylnaphthalene 2-Methylnaphthalene Biphenyl Naphthalene 2,6-Dimethylnaphthalene Acenaphthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10023 B18-10030 B18-10078	2-Methylnaphthalene	J (all detects)	A	Certified reference material (%R) (LP)

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-006

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 8/9/19

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW/SW	
IX.	Laboratory control samples	SW/SW	LCS/D. CRL
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10~~617~~ 117	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023MS	56514MS	Sediment	07/16/18
12	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128C2b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9/6

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	11/12	TTT	48 (50-150)	47 (50-150)	( )	1 (dets)	J (M) / A (HM)
		W	48 ( )	47 ( )	( )		
		S	37 ( )	32 ( )	( )		
		CCC	154 ( )	154 ( )	( )		J dets / A (HM)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	(25)		
	13	GG	( )	( )	92 (<30)	1 (dets) (ND)	J dets / A (HD)
		III	( )	( )	34 ( )	1 dets	
		WWW	( )	( )	26 ( )		
		HHH	( )	( )	26 ( )		
		DDD	( )	( )	27 ( )		
		YY	( )	( )	43 ( )		
		22	( )	( )	42 ( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

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LDC #: 45128C-b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: JVP

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20646-BS1/-BS2	TTT	49 (70-130)	53 (70-130)	( )	1-3. MB	J/N/P(LL)
			XXX	59 ( )	60 ( )	( )	(dets+ND)	
			W	50 ( )	53 ( )	( )		
			[illegible]	60 ( )	61 ( )	( )		
			DD	59 ( )	61 ( )	( )		
			ZZZZ	55 ( )	57 ( )	( )		
			S	41 ( )	46 ( )	( )		
			CCC	149 ( )	146 ( )	( )		J dets P(HL)
			NN	131 ( )	( )	( )		
				( )	( )	( )		
		2064T-CRM SRM 1944	W	56 (60-140)	( )	( )	1-3. MB	J/U/A(LP)
				( )	( )	( )	(dets)	
				( )	( )	( )		
		56510-BS1/-BS2	TTT	59 (70-130)	54 (70-130)	( )	4-10. MB	J/N/P(LL)
			W	61 ( )	55 ( )	( )	(dets)	
			ZZZZ	64 ( )	60 ( )	( )		
			S	48 ( )	42 ( )	( )		
			CCC	171 ( )	171 ( )	( )		J dets P(HL)
			[illegible]	131 ( )	135 ( )	( )		
			NN	139 ( )	144 ( )	( )		
			XXX	( )	65 ( )	( )		J/U/P(LL)
			[illegible]	( )	67 ( )	( )		
			[illegible]	( )	134 ( )	( )		J dets P(HL)
			YY	( )	131 ( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	PBDE 190	39 (50-150)	46 (50-150)	J (all detects) UJ (all non-detects)	A
	PBDE 209	19 (50-150)	25 (50-150)	J (all detects) UJ (all non-detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	PBDE 183	26 (≤25)	NA	-
B18-10023MS/MSD (B18-10023)	PBDE 209	27 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20646-BS1/BS2 (B18-10023 B18-10030 B18-10078)	PBDE 190 PBDE 209	59 (70-130) 23 (70-130)	66 (70-130) 25 (70-130)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	PBDE 190 PBDE 209	65 (70-130) 22 (70-130)	- 51 (70-130)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10081 B18-10082 B18-10083 B18-10084)	PBDE 209	79 (≤30)	J (all detects)	P
56510-BS1/BS2 (B18-10080)	PBDE 209	79 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, LCS/LCSD %R and RPD, and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-006

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023	PBDE 190 PBDE 209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023	PBDE 209	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	PBDE 190 PBDE 209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10079 B18-10117 B18-10081 B18-10082 B18-10083 B18-10084	PBDE 209	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C2c **VALIDATION COMPLETENESS WORKSHEET** Date: 9/15

SDG #: 1807003-006 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 1

2nd Reviewer: JW

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A/A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
IX.	Laboratory control samples /CRM	SW/A	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10~~047~~ 117	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023MS	56514MS	Sediment	07/16/18
12	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18

LDC #: 45128C2aC

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: [signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.
(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?
Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	11/12	PBDE 190	39 (50-150)	46 (50-150)	( )	1 (dets+ND)	J/UJ/A (LM)
		↓ 209	19 (↓)	25 (↓)	( )		↓
		PBDE 183	( )	( )	26 (≤25)	(ND)	J dets/A (HD)
		↓ 209	( )	( )	27 (↓)	(dets)	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC #: 45128C2a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20646-BS1/	PBDE190	59 (70-130)	66 (70-130)	( )	1-3. MB	J/UJ/P (LL)
		-BS2	↓ 209	23 (↓)	25 (↓)	( )	(dets + ND)	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		56510-BS1/	PBDE190	65 (70-130)	( )	( )	4-10. MB	J/UJ/P (LL)
		-BS1	↓ 209	22 (↓)	51 (70-130)	( )	(dets + ND)	↓
			PBDE209	( )	( )	79 (≤ 30)	(dets=4-5, 7-10)	J dets/P (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-006

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C2d **VALIDATION COMPLETENESS WORKSHEET** Date: 5/29/19
SDG #: 1807003-006 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JPG

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	A/A	
IX.	Laboratory control samples	A	LCSD
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10~~017~~117	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023MS	56514MS	Sediment	07/16/18
12	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
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LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	Allethrin Cyhalothrin, total lambda Permethrin, cis-	159 (50-150) 154 (50-150) -	162 (50-150) 167 (50-150) 154 (50-150)	NA	-
B18-10023MS/MSD (B18-10023)	Prallethrin	5 (50-150)	3 (50-150)	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	Fluvalinate Prallethrin	26 (≤25) 50 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-006

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023	Prallethrin	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C2e **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/19
SDG #: 1807003-006 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: CVC

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	SW/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10017	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023MS	56514MS	Sediment	07/16/18
12	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				

LDC #: 43P8C29

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	11/12	~~Atrazine~~ A	159 (50-150)	162 (50-150)	( )	1 (ND)	J dets/A (HM)
		D	154 (↓)	167 (↓)	( )		↓
		L	5 (↓)	3 (↓)	( )		J/UJ/A (LM)
		J	( )	154 (↓)	( )		J dets/A (HM)
		I	( )	( )	26 (≤25)		J/ (HD)
		L	( )	( )	50 (↓)		↓ ↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18

Introduction

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The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	Dicofol	46 (50-150)	-	UJ (all non-detects)	A
	Endosulfan I	20 (50-150)	23 (50-150)	UJ (all non-detects)	
	Endosulfan II	41 (50-150)	43 (50-150)	UJ (all non-detects)	
	Endrin aldehyde	18 (50-150)	29 (50-150)	UJ (all non-detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10023MS/MSD (B18-10023)	Endrin aldehyde	47 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20646-BS1 (B18-10023 B18-10030 B18-10078)	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	55 (70-130) 12 (70-130) 37 (70-130) 12 (70-130)	51 (70-130) 14 (70-130) 40 (70-130) 13 (70-130)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
20646-BS1 (B18-10023 B18-10030 B18-10078)	Methoxychlor	150 (70-130)	150 (70-130)	NA	-
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Endosulfan I	3 (70-130)	3 (70-130)	R (all non-detects)	P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Endosulfan II Endrin aldehyde	21 (70-130) 10 (70-130)	22 (70-130) 29 (70-130)	UJ (all non-detects) UJ (all non-detects)	P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Methoxychlor Perthane	142 (70-130) 131 (70-130)	144 (70-130) 135 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	Endrin aldehyde	97 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in seven samples.

Due to MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-006

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023 B18-10030 B18-10078	Dicofol Endosulfan I Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C3a **VALIDATION COMPLETENESS WORKSHEET** Date: 5-29-19
SDG #: 1807003-006 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 1
2nd Reviewer: JM

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
IX.	Laboratory control samples /CRM	SW/SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1 1	B18-10023	56514	Sediment	07/16/18
2 1	B18-10030	56515	Sediment	07/16/18
3 1	B18-10078	56516	Sediment	07/16/18
4 2	B18-10079	56517	Sediment	07/16/18
5 2	B18-10~~047~~ 117	56518	Sediment	07/16/18
6 2	B18-10080	56519	Sediment	07/17/18
7 2	B18-10081	56520	Sediment	07/17/18
8 2	B18-10082	56521	Sediment	07/17/18
9 2	B18-10083	56522	Sediment	07/17/18
10 2	B18-10084	56523	Sediment	07/17/18
11 1	B18-10023MS	56514MS	Sediment	07/16/18
12 1	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18

0-21008, /0-21010 /~~0-21008~~

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45128c3a

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	11/12	Dicofol	46 (50-150)	( )	( )	1 (ND)	J/UJ/A (LM)
		H	20 (↓)	23 (50-150)	( )		↓ ↓
		L	41 ( )	43 (↓)	( )		
		R	18 ( )	29 ( )	( )		
		R	( )	( )	47 (≤25)		J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC #: 43528C3a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20646-BS1	Dicofol	55 (70-130)	51 (70-130)	( )	1-3. MB (ND)	J (all)
			H	12 ( )	14 ( )	( )		
			L	37 ( )	40 ( )	( )		
			R	12 ( )	13 ( )	( )		
			P	150 ( )	150 ( )	( )		Delete (HL)
				( )	( )	( )		
				( )	( )	( )		
		20510-BS1	H	3 (70-130)	3 (70-130)	( )	4-10. MB (ND)	J (all)
			L	21 ( )	22 ( )	( )		J (all)
		-BS2	R	10 ( )	29 ( )	( )		
			P	142 ( )	144 ( )	( )		Delete (HL)
			Perthane	131 ( )	135 ( )	( )		
			R	( )	( )	9T ( )		Delete (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56510-BS1/BS2 (B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084)	PCB-169	133 (70-130)	-	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
20647-CRM1	PCB-105 PCB-118 PCB-128 PCB-156 PCB-206	35 (60-140) 58 (60-140) 19 (60-140) 28 (60-140) 53 (60-140)	B18-10023 B18-10030 B18-10078	J (all detects) UJ (all non-detects)	A
56512-CRM1	PCB-105 PCB-118 PCB-128 PCB-156 PCB-194	40 (60-140) 53 (60-140) 40 (60-140) 40 (60-140) 58 (60-140)	B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to CRM %R and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-006

Sample	Compound	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078	PCB-105 PCB-118 PCB-128 PCB-156 PCB-206	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	PCB-105 PCB-118 PCB-128 PCB-156 PCB-194	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C3b **VALIDATION COMPLETENESS WORKSHEET** Date: 8/5/19
SDG #: 1807003-006 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 1
2nd Reviewer: JVG

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates DUP	A/A	
IX.	Laboratory control samples LCS/LCSD	SW/SW	LCS/D. CPM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10~~817~~ 117	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023MS	56514MS	Sediment	07/16/18
12	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18

0-2/0008 / 0-21010

LDC #: 45528C36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JV6

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y)N N/A Was a LCS required?

(Y)N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SRM1944	PCB105	35 (60-140)	( )	( )	1-3, MB	J/UJ/A (LP)
		(206AT-CRM1)	118	58 ( )	( )	( )	(det+ND)	
			128	19 ( )	( )	( )		
			156	28 ( )	( )	( )		
			206	53 ( )	( )	( )		
				( )	( )	( )		
		56510-BS1/-BS2	PCB169	133 (70-130)	( )	( )	4-10, MB (ND)	J(det)/A (HP)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		SRM1944	PCB105	40 (60-140)	( )	( )	4-10, MB	J/UJ/A (LP)
		(56510-CRM1)	118	53 ( )	( )	( )	(det+ND)	
			128	40 ( )	( )	( )		
			156	40 ( )	( )	( )		
			194	58 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023(SEM)	56514(SEM)	Sediment	07/16/18
B18-10030(SEM)	56515(SEM)	Sediment	07/16/18
B18-10078(SEM)	56516(SEM)	Sediment	07/16/18
B18-10079(SEM)	56517(SEM)	Sediment	07/16/18
B18-10117(SEM)	56518(SEM)	Sediment	07/16/18
B18-10080(SEM)	56519(SEM)	Sediment	07/17/18
B18-10081(SEM)	56520(SEM)	Sediment	07/17/18
B18-10082(SEM)	56521(SEM)	Sediment	07/17/18
B18-10083(SEM)	56522(SEM)	Sediment	07/17/18
B18-10084(SEM)	56523(SEM)	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18
B18-10023MS(SEM)	56514MS(SEM)	Sediment	07/16/18
B18-10023MSD(SEM)	56514MSD(SEM)	Sediment	07/16/18
B18-10023DUP(SEM)	56514DUP(SEM)	Sediment	07/16/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117	Mercury	176	28	J (all detects)	P
B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Mercury	175	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10023MS/MSD(SEM) (B18-10023(SEM) B18-10030(SEM) B18-10078(SEM) B18-10079(SEM) B18-10117(SEM) B18-10080(SEM) B18-10081(SEM) B18-10082(SEM) B18-10083(SEM) B18-10084(SEM))	Silver	-	66 (75-125)	UJ (all non-detects)	A

For B18-10023MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in twenty samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-006

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Mercury	J (all detects)	P	Technical holding times (H)
B18-10023(SEM) B18-10030(SEM) B18-10078(SEM) B18-10079(SEM) B18-10117(SEM) B18-10080(SEM) B18-10081(SEM) B18-10082(SEM) B18-10083(SEM) B18-10084(SEM)	Silver	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084 B18-10023(SEM) B18-10030(SEM) B18-10078(SEM) B18-10079(SEM) B18-10117(SEM) B18-10080(SEM) B18-10081(SEM) B18-10082(SEM) B18-10083(SEM) B18-10084(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C4a **VALIDATION COMPLETENESS WORKSHEET** Date: 5/3/19
SDG #: 1807003-006 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: CC
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	21/22: Al, Fe 74%
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D, CRM
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10~~17~~ 17	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023(SEM)	56514(SEM)	Sediment	07/16/18
12	B18-10030(SEM)	56515(SEM)	Sediment	07/16/18
13	B18-10078(SEM)	56516(SEM)	Sediment	07/16/18
14	B18-10079(SEM)	56517(SEM)	Sediment	07/16/18
15	B18-10017(SEM)	56518(SEM)	Sediment	07/16/18

LDC #: 45128C4a **VALIDATION COMPLETENESS WORKSHEET** Date: 5/3/19
SDG #: 1807003-006 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10080(SEM)	56519(SEM)	Sediment	07/17/18
17	B18-10081(SEM)	56520(SEM)	Sediment	07/17/18
18	B18-10082(SEM)	56521(SEM)	Sediment	07/17/18
19	B18-10083(SEM)	56522(SEM)	Sediment	07/17/18
20	B18-10084(SEM)	56523(SEM)	Sediment	07/17/18
21	B18-10023MS	56514MS	Sediment	07/16/18
22	B18-10023MSD	56514MSD	Sediment	07/16/18
23	B18-10023DUP	56514DUP	Sediment	07/16/18
24	B18-10023MS(SEM)	56514MS(SEM)	Sediment	07/16/18
25	B18-10023MSD(SEM)	56514MSD(SEM)	Sediment	07/16/18
26	B18-10023DUP(SEM)	56514DUP(SEM)	Sediment	07/16/18
27				
28				
29				
30				
31				
32				
33				
34				
35				

Notes:

LDC #: 45128C4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-10		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
11-20		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC: 21-23		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, [✓ P]
24-26		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti

Comments: Mercury by CVAA if performed

LDC #: 45128C4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: G
2nd reviewer: G

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

(H)

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-5	7/16/18	1/8/19	176	J/R/P	Det		
6-10	7/17/18	1/8/19	175	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128C4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: CT
2nd Reviewer: CT

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	24/25		Ag		66		11-20	J/UJ/A (ND) (LM)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-006

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10023	56514	Sediment	07/16/18
B18-10030	56515	Sediment	07/16/18
B18-10078	56516	Sediment	07/16/18
B18-10079	56517	Sediment	07/16/18
B18-10117	56518	Sediment	07/16/18
B18-10080	56519	Sediment	07/17/18
B18-10081	56520	Sediment	07/17/18
B18-10082	56521	Sediment	07/17/18
B18-10083	56522	Sediment	07/17/18
B18-10084	56523	Sediment	07/17/18
B18-10023MS	56514MS	Sediment	07/16/18
B18-10023MSD	56514MSD	Sediment	07/16/18
B18-10023DUP	56514DUP	Sediment	07/16/18
B18-10079DUP	56517DUP	Sediment	07/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10023 B18-10030 B18-10078	Acid volatile sulfide Ammonia as N Total nitrogen	172 days 171 days 178 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A
B18-10079 B18-10117	Acid volatile sulfide Ammonia as N Total nitrogen	172 days 171 days 179 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A
B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Acid volatile sulfide Ammonia as N Total nitrogen	171 days 170 days 178 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-006	Analytes reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-006

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10023 B18-10030 B18-10078 B18-10079 B18-10117 B18-10080 B18-10081 B18-10082 B18-10083 B18-10084	Analytes reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-006

No Sample Data Qualified in this SDG

LDC #: 45128C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/3/19
SDG #: 1807003-006 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D, CRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10023	56514	Sediment	07/16/18
2	B18-10030	56515	Sediment	07/16/18
3	B18-10078	56516	Sediment	07/16/18
4	B18-10079	56517	Sediment	07/16/18
5	B18-10~~017~~ 117	56518	Sediment	07/16/18
6	B18-10080	56519	Sediment	07/17/18
7	B18-10081	56520	Sediment	07/17/18
8	B18-10082	56521	Sediment	07/17/18
9	B18-10083	56522	Sediment	07/17/18
10	B18-10084	56523	Sediment	07/17/18
11	B18-10023MS	56514MS	Sediment	07/16/18
12	B18-10023MSD	56514MSD	Sediment	07/16/18
13	B18-10023DUP	56514DUP	Sediment	07/16/18
14	B18-10079DUP	56517DUP	Sediment	07/16/18
15				
16				
17				

LDC #: 45R8C6

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: Q

All circled methods are applicable to each sample.

Sample ID	Parameter
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ TS] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 11,12	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
13	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ N]
14	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ %solids]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128C6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

(X)

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-5	7/16/18	1/4/19	172	J/R/A (Det)	1/3/19	171	J/R/A (Det)
6-10	7/17/18	1/4/19	171	J/R/A (Det)	1/3/19	170	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-3	7/16/18				1/10/19	178	J/R/A (Det)
4, 5	7/16/18				1/11/19	179	J/R/A (Det)
6-10	7/17/18				1/11/19	178	J/R/A (Det)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Benzo(b)fluoranthene Fluoranthene	194 (50-150) 162 (50-150)	183 (50-150) -	J (all detects) J (all detects)	A
B18-10076MS/MSD (B18-10076)	Naphthalene	43 (50-150)	-	J (all detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Naphthalene	28 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	1-Methylnaphthalene 2-Methylnaphthalene	32 (≤25) 26 (≤25)	J (all detects) J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20904-BS1/BSD (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	1-Methylnaphthalene 2-Methylnaphthalene Biphenyl Naphthalene 2,6-Dimethylnaphthalene Acenaphthene	59 (70-130) 61 (70-130) 64 (70-130) 48 (70-130) - -	54 (70-130) 55 (70-130) 60 (70-130) 42 (70-130) 65 (70-130) 67 (70-130)	J (all detects) UJ (all non-detects)	P
20904-BS1/BSD (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Fluoranthene	171 (70-130) 131 (70-130) 139 (70-130) - -	171 (70-130) 135 (70-130) 144 (70-130) 134 (70-130) 131 (70-130)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56578-BS1/BS2 (B18-10119 B18-10121 B18-10123 B18-10178)	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Biphenyl Naphthalene 2,6-Dimethylnaphthalene	59 (70-130) 63 (70-130) 67 (70-130) 64 (70-130) 51 (70-130) -	57 (70-130) 60 (70-130) 66 (70-130) 62 (70-130) 49 (70-130) 68 (70-130)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P
56578-BS1/BS2 (B18-10119 B18-10121 B18-10123 B18-10178)	Benzo(a)anthracene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Fluoranthene Indeno(1,2,3-cd)pyrene	196 (70-130) 147 (70-130) 142 (70-130) 131 (70-130) 156 (70-130)	200 (70-130) 148 (70-130) 147 (70-130) - 163 (70-130)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56580-CRM1 (SRM 1994)	Benzo(k)fluoranthene	41 (60-140)	B18-10119 B18-10121 B18-10123 B18-10178	J (all detects)	A

X. Field Replicates

Samples B18-10116 and B18-20116 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10116	B18-20116	
1,6,7-Trimethylnaphthalene	1.27	1.38	8
1-Methylnaphthalene	0.814	0.836	3
1-Methylphenanthrene	1.51	1.32	13
2,6-Dimethylnaphthalene	0.577	0.624	8
2-Methylnaphthalene	1.64	1.70	4
Acenaphthene	0.50U	0.157	Not calculable
Acenaphthylene	0.233	0.331	35

Compound	Concentration (ng/g)		RPD
	B18-10116	B18-20116	
Anthracene	0.762	0.767	1
Benzo(a)anthracene	21.8	6.02	113
Benzo(a)pyrene	8.1	3.69	75
Benzo(b)fluoranthene	11.8	5.47	73
Benzo(e)pyrene	7.06	3.58	65
Benzo(g,h,i)perylene	4.66	3.77	21
Benzo(k)fluoranthene	8.53	4.3	66
Biphenyl	0.291	0.275	6
Chrysene	7.27	2.52	97
Dibenzo(a,h)anthracene	4.79	3.2	40
Dibenzothiophene	0.324	0.357	10
Fluoranthene	10.4	4.96	71
Fluorene	0.643	0.605	6
Indeno(1,2,3-cd)pyrene	19.4	14.2	31
Naphthalene	2.17	1.91	13
Perylene	1.64	0.766	73
Phenanthrene	4.51	4.29	5
Pyrene	9.84	5.13	63

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, DUP RPD, LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10076	Benzo(b)fluoranthene Fluoranthene	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10076	Naphthalene	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10076	Naphthalene	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10076	1-Methylnaphthalene 2-Methylnaphthalene	J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032	1-Methylnaphthalene 2-Methylnaphthalene Biphenyl Naphthalene 2,6-Dimethylnaphthalene Acenaphthene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032	Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10119 B18-10121 B18-10123 B18-10178	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Biphenyl Naphthalene 2,6-Dimethylnaphthalene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10119 B18-10121 B18-10123 B18-10178	Benzo(a)anthracene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Fluoranthene Indeno(1,2,3-cd)pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)

Sample	Compound	Flag	A or P	Reason (Code)
B18-10119 B18-10121 B18-10123 B18-10178	Benzo(k)fluoranthene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/9/19

Page: 1 of 2

Reviewer: 1

2nd Reviewer: JW

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	SW	
IX.	Laboratory control samples LCS/SRM	SW	LCS/D. SRM
X.	Field duplicates	SW	D=10+11
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18

LDC #: 45128D2b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/29/19
SDG #: 1807003-008 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10076MS	56583MS	Sediment	07/18/18
19	B18-10076MSD	56583MSD	Sediment	07/18/18
20	B18-10076DUP	56583DUP	Sediment	07/18/18
21				
22				
23				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 1,6,7 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128D2b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: JVG

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		18/19	GGG	194 (50-150)	183 (50-150)	( )	2 (dets)	J dets/A (HM)
			YY	162 ( )	( )	( )		
			S	43 ( )	( )	( )		J/UJ/A (<M)
			S	( )	( )	28 (≤25)		J dets/A (HD)
				( )	( )	( )		
				( )	( )	( )		
		20	TTT	( )	( )	32 (≤25)	2 (dets)	J dets/A (HD)
			W	( )	( )	26 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: ~~45280~~ 36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

~~Y~~ N N/A Was a LCS required?

Y ~~N~~ N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20904-BS1/-BSD	TTT	59 (70-130)	54 (70-130)	( )	1-13, MB	J/UJ/P (LL)
			W	61 ( )	55 ( )	( )	(dets+ND)	
			EEEE	64 ( )	60 ( )	( )		
			S	48 ( )	42 ( )	( )		
			XXX	( )	65 ( )	( )		
			~~GG~~	( )	67 ( )	( )		
			CCC	171 ( )	171 ( )	( )	(dets)	~~J~~/P (HL)
			~~FFF~~	131 ( )	135 ( )	( )		
			YY	139 ( )	144 ( )	( )		
			~~KKK~~	( )	134 ( )	( )		
			YY	( )	131 ( )	( )		
				( )	( )	( )		
		565708-BS1/BSD	TTT	59 (70-130)	57 (70-130)	( )	14-17, MB	J/UJ/P (LL)
			W	63 ( )	60 ( )	( )	(dets)	
			~~GG~~	67 ( )	66 ( )	( )		
			EEEE	64 ( )	62 ( )	( )		
			S	51 ( )	49 ( )	( )		
			XXX	( )	68 ( )	( )		
			CCC	196 ( )	200 ( )	( )		~~J~~/P (HL)
			~~FFF~~	147 ( )	148 ( )	( )		
			~~KKK~~	142 ( )	147 ( )	( )		
			YY	131 ( )	( )	( )		
			YYY	156 ( )	163 ( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

LDC #: 45128D2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: J
2nd Reviewer: My

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56580-CRM1	HHH	41 (60-140)	( )	( )	14-17, MB	J/UJ/A (LP)
		(SRM1944)		( )	( )	( )	(dets)	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC#: 45128D2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: JM

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/g)		RPD
	10	11	
YYY	1.27	1.38	8
TTT	0.814	0.836	3
HHHH	1.51	1.32	13
XXX	0.577	0.624	8
W	1.64	1.70	4
GG	0.50U	0.157	NC
DD	0.233	0.331	35
VV	0.762	0.767	1
CCC	21.8	6.02	113
III	8.1	3.69	75
GGG	11.8	5.47	73
WWW	7.06	3.58	65
LLL	4.66	3.77	21
HHH	8.53	4.3	66
EEEE	0.291	0.275	6
DDD	7.27	2.52	97
KKK	4.79	3.2	40
AAAA	0.324	0.357	10
YY	10.4	4.96	71
NN	0.643	0.605	6
JJJ	19.4	14.2	31
S	2.17	1.91	13
ZZZ	1.64	0.766	73
UU	4.51	4.29	5
ZZ	9.84	5.13	63

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	PBDE 190 PBDE 209 PBDE 183	36 (50-150) 12 (50-150) -	28 (50-150) 7 (50-150) 45 (50-150)	J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	PBDE 209	53 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	PBDE 099	49 (≤25)	J (all detects)	A
	PBDE 100	35 (≤25)	J (all detects)	
	PBDE 153	93 (≤25)	J (all detects)	
	PBDE 154	26 (≤25)	J (all detects)	
	PBDE 209	36 (≤25)	J (all detects)	

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20904-BS1/BS2 (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	PBDE 190	65 (70-130)	-	J (all detects) UJ (all non-detects)	P
	PBDE 209	22 (70-130)	51 (70-130)	J (all detects) UJ (all non-detects)	
56578-BS1/BS2 (B18-10119 B18-10121 B18-10123 B18-10178)	PBDE 190	67 (70-130)	61 (70-130)	J (all detects) UJ (all non-detects)	P
	PBDE 209	22 (70-130)	17 (70-130)	J (all detects) UJ (all non-detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
20904-BS1/BS2 (B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10031 B18-10032)	PBDE 209	79 (≤30)	J (all detects)	P
20904-BS1/BS2 (B18-10022 B18-10116 B18-20116)	PBDE 209	79 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Replicates

Samples B18-10116 and B18-20116 were identified as field replicates. No results were detected in any of the samples.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, DUP RPD, LCS/LCSD %R and RPD, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10076	PBDE 190 PBDE 209 PBDE 183	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10076	PBDE 209	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10076	PBDE 099 PBDE 100 PBDE 153 PBDE 154 PBDE 209	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	PBDE 190 PBDE 209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10031 B18-10032	PBDE 209	J (all detects)	P	Laboratory control samples (RPD) (HD)

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D2c **VALIDATION COMPLETENESS WORKSHEET** Date: 5/29/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates (DUP)	SW	
IX.	Laboratory control samples (CRM)	A/A	LCS/D. CRM
X.	Field duplicates	ND	D=10+11
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18

LDC #: 45128D2c
SDG #: 1807003-008
Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 9/9/19
Page: 2 of 2
Reviewer: [illegible]
2nd Reviewer: JVO

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10076MS	56583MS	Sediment	07/18/18
19	B18-10076MSD	56583MSD	Sediment	07/18/18
20	B18-10076DUP	56583DUP	Sediment	07/18/18
21				
22				
23				

Notes:

LDC #: 45280c

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		18/19	BDE190	36 (50-150)	28 (50-150)	( )	2 (dets+ND)	J/UJ A (LM)
			209	12 ( )	T ( )	( )		
			183	( )	45 ( )	( )		
			BDE209	( )	( )	53 (≤25)		J dets A (HD)
				( )	( )	( )		
				( )	( )	( )		
		20	BDE099	( )	( )	49 (≤25)	2 (dets)	J dets A (HD)
			100	( )	( )	35 ( )		
			153	( )	( )	93 ( )		
			154	( )	( )	26 ( )		
			209	( )	( )	36 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 45178D2c

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required? (Y circled)

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits? (N circled)

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20904-BS1/	PBDE190	65 (70-130)	( )	( )	1-13, MB	J/UJ/P (LL)
		-BS2	↓ 209	22 (↓)	51 (70-130)	( )	(dets + ND)	↓
			PBDE209	( )	* ( )	79 (≤30)	(dets=2-9,12-13)	J dets/P (HD)
				( )	( )	( )		
				( )	( )	( )		
		56578-BS1/	PBDE190	67 (70-130)	61 (70-130)	( )	14-17, MB	J/UJ/P (LL)
		-BS2	209	22 (↓)	17 (↓)	( )	(dets+ND)	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Fipronil desulfinyl	156 (50-150)	164 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10116 and B18-20116 were identified as field replicates. No results were detected in any of the samples.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D2d **VALIDATION COMPLETENESS WORKSHEET** Date: 4/29/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	MS/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D = D=10+11
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18

LDC #: 45128D2d **VALIDATION COMPLETENESS WORKSHEET** Date: 2/9/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

	Client ID	Lab ID	Matrix	Date
14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10076MS	56583MS	Sediment	07/18/18
19	B18-10076MSD	56583MSD	Sediment	07/18/18
20	B18-10076DUP	56583DUP	Sediment	07/18/18
21				
22				
23				

Notes:

LDC #: 45P8D2d

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		18/19	*	156 (50-150)	164 (50-150)	( )	2 (ND)	Jdets/A (HM)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		* Fipronil Desulfinyl		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Cyhalothrin, total lambda	169 (50-150)	165 (50-150)	NA	-
B18-10076MS/MSD (B18-10076)	Deltamethrin/Tralomethrin Prallethrin	37 (50-150) 38 (50-150)	44 (50-150) 38 (50-150)	UJ (all non-detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	Danitol (Fenpropathrin)	26 (≤25)	J (all detects)	A

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10116 and B18-20116 were identified as field replicates. No results were detected in any of the samples.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10076	Deltamethrin/Tralomethrin Prallethrin	UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10076	Danitol (Fenpropathrin)	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D2e

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/29/19

SDG #: 1807003-008

Page: 1 of 2

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: [illegible]

2nd Reviewer: JVL

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	SW/SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D = 10+11
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18

LDC #: 45128D2e **VALIDATION COMPLETENESS WORKSHEET** Date: 5/29/19
SDG #: 1807003-008 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JM

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

	Client ID	Lab ID	Matrix	Date
14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10076MS	56583MS	Sediment	07/18/18
19	B18-10076MSD	56583MSD	Sediment	07/18/18
20	B18-10076DUP	56583DUP	Sediment	07/18/18
21				
22				
23				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				

LDC #: 45178D2e

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		18/19	D	169 (50-150)	165 (50-150)	( )	2 (ND)	J dets/A (HM)
			G	37 (↓)	44 (↓)	( )		J/UJ/A (LM)
			L	38 (↓)	38 (↓)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
		20	F	( )	( )	26 (≤25)	2 (dets)	J dets/A (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Endosulfan I Endosulfan II Endrin aldehyde	19 (50-150) 23 (50-150) 11 (50-150)	16 (50-150) 20 (50-150) 8 (50-150)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
B18-10076MS/MSD (B18-10076)	Methoxychlor Perthane	157 (50-150) 154 (50-150)	160 (50-150) 152 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Endrin aldehyde	32 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20904-BS1/BS2 (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	Endosulfan I	3 (70-130)	3 (70-130)	R (all non-detects)	P
20904-BS1/BS2 (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	Endosulfan II Endrin aldehyde	21 (70-130) 10 (70-130)	22 (70-130) 29 (70-130)	UJ (all non-detects) UJ (all non-detects)	P

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20904-BS1/BS2 (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	Methoxychlor Perthane	142 (70-130) 131 (70-130)	144 (70-130) 135 (70-130)	NA	-
56578-BS1 (B18-10119 B18-10121 B18-10123 B18-10178)	Endosulfan I	2 (70-130)	2 (70-130)	R (all non-detects)	P
56578-BS1 (B18-10119 B18-10121 B18-10123 B18-10178)	Endosulfan II Endrin aldehyde alpha-Chlordane cis-Nonachlor	15 (70-130) 10 (70-130) - -	15 (70-130) 30 (70-130) 68 (70-130) 68 (70-130)	J (all detects) UJ (all non-detects)	P
56578-BS1 (B18-10119 B18-10121 B18-10123 B18-10178)	Methoxychlor Perthane	153 (70-130) 136 (70-130)	159 (70-130) 135 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56578-BS1 (B18-10119 B18-10121 B18-10123 B18-10178)	Endrin aldehyde	100 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Replicates

Samples B18-10116 and B18-20116 were identified as field replicates. No results were detected in any of the samples.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in seventeen samples.

Due to MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10076	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10119 B18-10121 B18-10123 B18-10178	Endosulfan II Endrin aldehyde alpha-Chlordane cis-Nonachlor	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D3a **VALIDATION COMPLETENESS WORKSHEET** Date: 5/2/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 9
2nd Reviewer:

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
IX.	Laboratory control samples /CPM	SW/A	LCS/D. CPM
X.	Field duplicates	ND	D=10+11
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18

LDC #: 45128D3a **VALIDATION COMPLETENESS WORKSHEET** Date: 5/29/19
SDG #: 1807003-008 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10076MS	56583MS	Sediment	07/18/18
19	B18-10076MSD	56583MSD	Sediment	07/18/18
20	B18-10076DUP	56583DUP	Sediment	07/18/18
21				
22				
23				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45128D3a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		18/19	H	19 (50-150)	16 (50-150)	( )	2 (ND)	J/UJ/A (<M)
			L	23 ( )	20 ( )	( )		
			R	11 ( )	8 ( )	( )		
			D	157 ( )	160 ( )	( )		Jdets/A (HM)
			Perthane	154 ( )	152 ( )	( )		
			R	( )	( )	32 (≤25)		Jdets/A (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 45R03A

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: SW

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20904-BS1/	H	3 (70-130)	3 (70-130)	( )	1-13. MB (ND)	↓A/P (LL)
		-BS2	L	21 ( )	22 ( )	( )		↓M/P ↓
			R	10 ( )	29 ( )	( )		↓
			P	42 ( )	144 ( )	( )		↓dets/P (HL)
			Perthane	131 (↓)	135 (↓)	( )		↓ ↓
				( )	( )	( )		
		56578-BS1	H	2 (70-130)	2 (70-130)	( )	14-17. MB (ND)	↓A/P (LL)
			L	15 ( )	15 ( )	( )	(dets + ND)	↓M/P ↓
			R	10 ( )	30 ( )	( )		↓
			P	153 ( )	159 ( )	( )	(ND)	↓dets/P (HL)
			Perthane	136 ( )	135 ( )	( )	↓	↓
			S	( )	68 ( )	( )		↓M/P (LL)
			~~RPD~~ RR	( )	68 ( )	( )		↓
			R	( )	( )	100 (≤30)	(ND)	↓dets/P (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	PCB-049	28 (≤25)	J (all detects)	A

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	PCB-031	26 (≤25)	J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56578-BS1/BS2 (B18-10119 B18-10121 B18-10123 B18-10178)	PCB-169 PCB-189 PCB-194 PCB-195	142 (70-130) 136 (70-130) 144 (70-130) -	169 (70-130) 151 (70-130) 149 (70-130) 132 (70-130)	NA	-
56578-BS1/BS2 (B18-10119 B18-10123)	PCB-206 PCB-209	144 (70-130) -	144 (70-130) 133 (70-130)	J (all detects) J (all detects)	A
56578-BS1/BS2 (B18-10121 B18-10178)	PCB-206 PCB-209	144 (70-130) -	144 (70-130) 133 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
20905-CRM1	PCB-105 PCB-118 PCB-128 PCB-156	40 (60-140) 53 (60-140) 40 (60-140) 40 (60-140)	B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032	J (all detects) UJ (all non-detects)	A
56580-CRM1	PCB-128 PCB-156	36 (60-140) 39 (60-140)	B18-10119 B18-10121 B18-10123 B18-10178	J (all detects) UJ (all non-detects)	A

X. Field Replicates

Samples B18-10116 and B18-20116 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10116	B18-20116	
PCB-101	0.126	0.127	1
PCB-153	0.135	0.204	41
PCB-138	0.2U	0.224	Not calculable
PCB-149	0.2U	0.0987	Not calculable
PCB-206	0.25U	0.329	Not calculable
PCB-209	0.25U	1.05	Not calculable

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD and DUP RPD, LCS/LCSD and CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10076	PCB-049	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10076	PCB-031	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10119 B18-10123	PCB-206 PCB-209	J (all detects) J (all detects)	A	Laboratory control samples (%R) (HL)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032	PCB-105 PCB-118 PCB-128 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10119 B18-10121 B18-10123 B18-10178	PCB-128 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 1 of 2

Reviewer: Q

2nd Reviewer: QC

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	MN/SW	
IX.	Laboratory control samples /CRM	MN/SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	D=10+11
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18

LDC #: 45128D3b
SDG #: 1807003-008
Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 6/29/19
Page: 1 of 2
Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10076MS	56583MS	Sediment	07/18/18
19	B18-10076MSD	56583MSD	Sediment	07/18/18
20	B18-10076DUP	56583DUP	Sediment	07/18/18
21				
22				
23				

Notes:

LDC #: 45128D3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: DVG

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		18/19	PCB049	( )	( )	28 (≤25)	2 (dets)	Jdets/A (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		20	PCB031	( )	( )	26 (≤25)	2 (dets)	Jdets/A (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: ~~45508~~ 36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVB

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		~~20904-BS1~~ / ~~-BS2~~		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		20905-CRM1	PCB105	40 (60-140)	( )	( )	1-13. MB	J/UN/A (LCP)
		(SRM 1944)	118	53 ( )	( )	( )	(dets+ND)	
			128	40 ( )	( )	( )		
			156	40 ( )	( )	( )		
				( )	( )	( )		
		56578-BS1	PCB169	142 (70-130)	169 (70-130)	( )	14-17. MB	J dets (HL)
		-BS2	189	136 ( )	151 ( )	( )	(ND)	
			194	144 ( )	149 ( )	( )		
			206	144 ( )	144 ( )	( )	~~(dets~~=14, 16)	
			195	( )	132 ( )	( )	~~(dets~~ (ND)	
			209	( )	133 ( )	( )	(dets=14, 16)	
				( )	( )	( )		
		56580-CRM1	PCB128	36 (60-140)	( )	( )	14-17. MB	J/UN/A (LCP)
		(SRM 1944)	156	39 ( )	( )	( )	(dets+ND)	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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LDC #: 45128D3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd reviewer:

METHOD: GC/MS PCB (EPA SW 846 Method 8270D)

Compound	Concentration (ng/g)		RPD
	10	11	
PCB101	0.126	0.127	1
PCB153	0.135	0.204	41
PCB138	0.2U	0.224	NC
PCB149	0.2U	0.0987	NC
PCB206	0.25U	0.329	NC
PCB209	.025U	1.05	NC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10022(SEM)	56582(SEM)	Sediment	07/18/18
B18-10076(SEM)	56583(SEM)	Sediment	07/18/18
B18-10077(SEM)	56584(SEM)	Sediment	07/18/18
B18-10112(SEM)	56585(SEM)	Sediment	07/18/18
B18-10113(SEM)	56586(SEM)	Sediment	07/18/18
B18-10024(SEM)	56587(SEM)	Sediment	07/19/18
B18-10029(SEM)	56588(SEM)	Sediment	07/19/18
B18-10114(SEM)	56589(SEM)	Sediment	07/19/18
B18-10115(SEM)	56590(SEM)	Sediment	07/19/18
B18-10116(SEM)	56591(SEM)	Sediment	07/19/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-20116(SEM)	56592(SEM)	Sediment	07/19/18
B18-10031(SEM)	56593(SEM)	Sediment	07/20/18
B18-10032(SEM)	56594(SEM)	Sediment	07/20/18
B18-10119(SEM)	56595(SEM)	Sediment	07/20/18
B18-10121(SEM)	56596(SEM)	Sediment	07/20/18
B18-10123(SEM)	56597(SEM)	Sediment	07/20/18
B18-10178(SEM)	56598(SEM)	Sediment	07/20/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18
B18-20116MS	56592MS	Sediment	07/19/18
B18-20116MSD	56592MSD	Sediment	07/19/18
B18-20116DUP	56592DUP	Sediment	07/19/18
B18-10076MS(SEM)	56583MS(SEM)	Sediment	07/18/18
B18-10076MSD(SEM)	56583MSD(SEM)	Sediment	07/18/18
B18-10076DUP(SEM)	56583DUP(SEM)	Sediment	07/18/18
B18-20116MS(SEM)	56592MS(SEM)	Sediment	07/19/18
B18-20116MSD(SEM)	56592MSD(SEM)	Sediment	07/19/18
B18-20116DUP(SEM)	56592DUP(SEM)	Sediment	07/19/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113	Mercury	177	28	J (all detects)	P
B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116	Mercury	176	28	J (all detects)	P
B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Mercury	175	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116)	Mercury	-	138 (75-125)	J (all detects)	A

For B18-10076MS/MSD and B18-20116MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116)	Aluminum Iron	29 (≤25) 67 (≤25)	J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
56579-CRM1	Aluminum	151 (42-124)	B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116	J (all detects)	A
60150-CRM1	Aluminum	127 (42-124)	B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	J (all detects)	A

XI. Field Duplicates

Samples B18-10116 and B18-20116 and samples B18-10116(SEM) and B18-20116(SEM) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/g)		RPD
	B18-10116	B18-20116	
Aluminum	4330	5990	32
Antimony	0.132	0.16	19
Arsenic	4.16	5	18
Barium	9.67	16.7	53
Beryllium	0.0925	0.137	39
Cadmium	0.0295	0.0352	18

Analyte	Concentration (ug/g)		RPD
	B18-10116	B18-20116	
Chromium	8.67	9.66	11
Copper	10.2	14.6	35
Iron	8500	8790	3
Lead	6.82	8.4	21
Mercury	0.0236	0.0425	57
Nickel	1.94	2.58	28
Phosphorus	176	234	28
Selenium	0.097	0.108	11
Silver	0.0938	0.0808	15
Zinc	33.9	45.8	30

Analyte	Concentration (umol/g)		RPD
	B18-10116(SEM)	B18-20116(SEM)	
Copper	0.0894	0.0989	10
Lead	0.0148	0.0219	39
Nickel	0.00363	0.00526	37
Zinc	0.238	0.371	44

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in thirty-four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-008

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Mercury	J (all detects)	P	Technical holding times (H)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116	Mercury	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116	Aluminum Iron	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Aluminum	J (all detects)	A	Certified reference material (%R) (HP)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178 B18-10022(SEM) B18-10076(SEM) B18-10077(SEM) B18-10112(SEM) B18-10113(SEM) B18-10024(SEM) B18-10029(SEM) B18-10114(SEM) B18-10115(SEM) B18-10116(SEM) B18-20116(SEM) B18-10031(SEM) B18-10032(SEM) B18-10119(SEM) B18-10121(SEM) B18-10123(SEM) B18-10178(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D4a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	~~35/36: Al, Fe~~
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCS/D, 9Rm)
XI.	Field Duplicates	SW	(10,11) (27,28)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18
14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18

LDC #: 45128D4a
SDG #: 1807003-008
Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 6/3/19
Page: 2 of 2
Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18
18	B18-10022(SEM)	56582(SEM)	Sediment	07/18/18
19	B18-10076(SEM)	56583(SEM)	Sediment	07/18/18
20	B18-10077(SEM)	56584(SEM)	Sediment	07/18/18
21	B18-10112(SEM)	56585(SEM)	Sediment	07/18/18
22	B18-10113(SEM)	56586(SEM)	Sediment	07/18/18
23	B18-10024(SEM)	56587(SEM)	Sediment	07/19/18
24	B18-10029(SEM)	56588(SEM)	Sediment	07/19/18
25	B18-10114(SEM)	56589(SEM)	Sediment	07/19/18
26	B18-10115(SEM)	56590(SEM)	Sediment	07/19/18
27	B18-10116(SEM)	56591(SEM)	Sediment	07/19/18
28	B18-20116(SEM)	56592(SEM)	Sediment	07/19/18
29	B18-10031(SEM)	56593(SEM)	Sediment	07/20/18
30	B18-10032(SEM)	56594(SEM)	Sediment	07/20/18
31	B18-10119(SEM)	56595(SEM)	Sediment	07/20/18
32	B18-10121(SEM)	56596(SEM)	Sediment	07/20/18
33	B18-10123(SEM)	56597(SEM)	Sediment	07/20/18
34	B18-10178(SEM)	56598(SEM)	Sediment	07/20/18
35	B18-10076MS	56583MS	Sediment	07/18/18
36	B18-10076MSD	56583MSD	Sediment	07/18/18
37	B18-10076DUP	56583DUP	Sediment	07/18/18
38	B18-20116MS	56592MS	Sediment	07/19/18
39	B18-20116MSD	56592MSD	Sediment	07/19/18
40	B18-20116DUP	56592DUP	Sediment	07/19/18
41	B18-10076MS(SEM)	56583MS(SEM)	Sediment	07/18/18
42	B18-10076MSD(SEM)	56583MSD(SEM)	Sediment	07/18/18
43	B18-10076DUP(SEM)	56583DUP(SEM)	Sediment	07/18/18
44	B18-20116MS(SEM)	56592MS(SEM)	Sediment	07/19/18
45	B18-20116MSD(SEM)	56592MSD(SEM)	Sediment	07/19/18
46	B18-20116DUP(SEM)	56592DUP(SEM)	Sediment	07/19/18
47				
48				

Notes:

LDC #: 45128B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-17		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
18-34		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
QC:35-37		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
38-39		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
41-46		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128D4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CG
2nd reviewer: CG

CH1

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-5	7/18/18	1/11/19	177	J/R/P	Det		
6-11	7/19/18	1/11/19	176	J/R/P	Det		
12-17	7/20/18	1/11/19	175	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128O4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ ~~20%~~ 25 for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	35/36		Al			29 (≤25)	1-10	J (HD)
			Fe			67 ↓	↓	↓
			Hg		138		↓	J (det) (Hm)

Comments: 35/36: Al, Fe 74X 38/39: Al, Fe 74X

MS-MSD.wpd

LDC #: 45129041a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: C
2nd Reviewer: 9

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	56579-CRM1		Al	151 (42-124)	1-10	J det (A) (det) (HP)
	60150-CRM1		Al	127	11-17	

Comments:

LDC#: 45128D4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/g)		RPD
	10	11	
Aluminum	4330	5990	32
Antimony	0.132	0.16	19
Arsenic	4.16	5	18
Barium	9.67	16.7	53
Beryllium	0.0925	0.137	39
Cadmium	0.0295	0.0352	18
Chromium	8.67	9.66	11
Copper	10.2	14.6	35
Iron	8500	8790	3
Lead	6.82	8.4	21
Mercury	0.0236	0.0425	57
Nickel	1.94	2.58	28
Phosphorus	176	234	28
Selenium	0.097	0.108	11
Silver	0.0938	0.0808	15
Zinc	33.9	45.8	30

LDC#: 45128D4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (umol/g)		RPD
	27	28	
Copper	0.0894	0.0989	10
Lead	0.0148	0.0219	39
Nickel	0.00363	0.00526	37
Zinc	0.238	0.371	44

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45128D4a.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10112	56585	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10029	56588	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-20116	56592	Sediment	07/19/18
B18-10031	56593	Sediment	07/20/18
B18-10032	56594	Sediment	07/20/18
B18-10119	56595	Sediment	07/20/18
B18-10121	56596	Sediment	07/20/18
B18-10123	56597	Sediment	07/20/18
B18-10178	56598	Sediment	07/20/18
B18-10022DUP	56582DUP	Sediment	07/18/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18
B18-10114MS	56589MS	Sediment	07/19/18
B18-10114MSD	56589MSD	Sediment	07/19/18
B18-10114DUP	56589DUP	Sediment	07/19/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113	Acid volatile sulfide	170 days	14 days	J (all detects)	A
B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116	Acid volatile sulfide	169 days	14 days	J (all detects)	A
B18-10031 B18-10032	Acid volatile sulfide	168 days	14 days	J (all detects)	A
B18-10119 B18-10121 B18-10123 B18-10178	Acid volatile sulfide	173 days	14 days	J (all detects)	A
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113	Ammonia as N	169 days	28 days	J (all detects)	A
B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116	Ammonia as N	168 days	28 days	J (all detects)	A
B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Ammonia as N	167 days	28 days	J (all detects)	A
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113	Total nitrogen	177 days	28 days	J (all detects)	A
B18-10116 B18-20116	Total nitrogen	176 days	28 days	R (all non-detects)	A

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10024 B18-10029 B18-10114 B18-10115	Total nitrogen	176 days	28 days	J (all detects)	A
B18-10031 B18-10032	Total nitrogen	175 days	28 days	J (all detects)	A
B18-10119 B18-10121 B18-10123 B18-10178	Total nitrogen	178 days	28 days	J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10114MS/MSD (B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032)	Acid volatile sulfide	-14 (80-120)	-5 (80-120)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10022DUP (All samples in SDG 1807003-008)	Grain size-Phi 2.0	26 (≤20)	-	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	B18-10116	B18-20116	
Acid volatile sulfide	0.965 mg/Kg	1.69 mg/Kg	55

Analyte	Concentration		RPD
	B18-10116	B18-20116	
Ammonia as N	3.65 mg/Kg	6.28 mg/Kg	53
Percent solids	79.1 %	75.7 %	4
Total organic carbon	0.12 %	0.14 %	15
Gravel	4.5 %	1.3 %	110

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in two samples.

Due to technical holding time, MS/MSD %R, DUP RPD, and results reported below the RL and above the MDL, data were qualified as estimated in seventeen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-008

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Acid volatile sulfide Ammonia as N	J (all detects) J (all detects)	A	Technical holding times (H)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Total nitrogen	J (all detects)	A	Technical holding times (H)
B18-10116 B18-20116	Total nitrogen	R (all non-detects)	A	Technical holding times (H)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032	Acid volatile sulfide	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Grain size-Phi 2.0	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10112 B18-10113 B18-10024 B18-10029 B18-10114 B18-10115 B18-10116 B18-20116 B18-10031 B18-10032 B18-10119 B18-10121 B18-10123 B18-10178	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45128D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/3/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: CG
2nd Reviewer:

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3-D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	A SW	
VIII.	Laboratory control samples	A	LCS/D, CRM
IX.	Field duplicates	SW	(10,11)
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10112	56585	Sediment	07/18/18
5	B18-10113	56586	Sediment	07/18/18
6	B18-10024	56587	Sediment	07/19/18
7	B18-10029	56588	Sediment	07/19/18
8	B18-10114	56589	Sediment	07/19/18
9	B18-10115	56590	Sediment	07/19/18
10	B18-10116	56591	Sediment	07/19/18
11	B18-20116	56592	Sediment	07/19/18
12	B18-10031	56593	Sediment	07/20/18
13	B18-10032	56594	Sediment	07/20/18
14	B18-10119	56595	Sediment	07/20/18
15	B18-10121	56596	Sediment	07/20/18
16	B18-10123	56597	Sediment	07/20/18
17	B18-10178	56598	Sediment	07/20/18

LDC #: 45128D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/3/19
SDG #: 1807003-008 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

18	B18-10022DUP	56582DUP	Sediment	07/18/18
19	B18-10076MS	56583MS	Sediment	07/18/18
20	B18-10076MSD	56583MSD	Sediment	07/18/18
21	B18-10076DUP	56583DUP	Sediment	07/18/18
22	B18-10114MS	56589MS	Sediment	07/19/18
23	B18-10114MSD	56589MSD	Sediment	07/19/18
24	B18-10114DUP	56589DUP	Sediment	07/19/18
25				
26				
27				

Notes:

LDC #: 45128D6

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-17	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ BSol.] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:18	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ PS]
19,20	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
21	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ N]
22,23	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ AVS]
24	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ AVS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128D6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CH
2nd reviewer:

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-5	7/18/18	1/4/19	170	J/R/A (Det)	1/3/19	169	J/R/A (Det)
6-11	7/19/18	1/4/19	169	J/R/A (Det)	1/3/19	168	J/R/A (Det)
12-13	7/20/18	1/4/19	168	J/R/A (Det)	1/3/19	167	J/R/A (Det)
14-17	7/20/18	1/9/19	173	J/R/A (Det)	1/3/19	167	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-5	7/18/18				1/11/19	177	J/R/A (Det)
6-11	7/19/18				1/11/19	176	J/R/A (10, 11=ND)
12-13	7/20/18				1/11/19	175	J/R/A (Det)
14-17	7/20/18				1/14/19	178	J/R/A (Det)

LDC #: 45128D6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the QAPP limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) within QAPP limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	22/23		AVS	-14 (80-120)	-5		1-13	J/R/A (Det) (LM)

Comments:

LDC #: 45128D6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: G
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. (CHD)

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		18		GrainSize-Phi2.0	26 (≤20)		All	J/UJ/A (Ref/M)

Comments: _____

LDC#: 45128D6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/Kg)		RPD
	10	11	
Acid volatile sulfides	0.965	1.69	55
Ammonia as N	3.65	6.28	53
Percent solids (%)	79.1	75.7	4
TOC (%)	0.12	0.14	15
Gravel (%)	4.5	1.3	110

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45128D6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 187003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	Benzo(a)anthracene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Fluoranthene	208 (50-150) 162 (50-150) 173 (50-150) 188 (50-150) -	234 (50-150) 170 (50-150) 178 (50-150) 208 (50-150) 159 (50-150)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
B18-10133MS/MSD (B18-10133)	Naphthalene 1-Methylnaphthalene	45 (50-150) -	37 (50-150) 49 (50-150)	J (all detects) J (all detects)	A

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133DUP (B18-10133)	Anthracene	45 (≤25)	J (all detects)	A
	Chrysene	30 (≤25)	J (all detects)	
	Dibenzo(a,h)anthracene	30 (≤25)	J (all detects)	
	Dibenzothiophene	44 (≤25)	J (all detects)	
	Fluoranthene	44 (≤25)	J (all detects)	
	Phenanthrene	35 (≤25)	J (all detects)	
	Pyrene	31 (≤25)	J (all detects)	

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56681-BS1/BS2 (All samples in SDG 1807003-010)	1-Methylnaphthalene	59 (70-130)	57 (70-130)	J (all detects)	P
	2-Methylnaphthalene	63 (70-130)	60 (70-130)	J (all detects)	
	Acenaphthene	67 (70-130)	66 (70-130)	J (all detects)	
	Biphenyl	64 (70-130)	62 (70-130)	J (all detects)	
	Naphthalene	51 (70-130)	49 (70-130)	J (all detects)	
	2,6-Dimethylnaphthalene	-	68 (70-130)	J (all detects)	
56681-BS1/BS2 (All samples in SDG 1807003-010)	Benzo(a)anthracene	196 (70-130)	200 (70-130)	J (all detects)	P
	Benzo(b)fluoranthene	147 (70-130)	148 (70-130)	J (all detects)	
	Dibenzo(a,h)anthracene	142 (70-130)	147 (70-130)	J (all detects)	
	Fluoranthene	131 (70-130)	-	J (all detects)	
	Indeno(1,2,3-cd)pyrene	156 (70-130)	163 (70-130)	J (all detects)	

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56683-CRM1 (SRM 1944)	Benzo(k)fluoranthene	41 (60-140)	All samples in SDG 1807003-010	J (all detects)	A

X. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
1,6,7-Trimethylnaphthalene	3.69	5.7	43
1-Methylnaphthalene	2.11	3.02	35
1-Methylphenanthrene	8.14	9.75	18
2,6-Dimethylnaphthalene	2.91	4.06	33
2-Methylnaphthalene	4.51	7.13	45
Acenaphthene	1.72	1.37	23
Acenaphthylene	10.4	15.5	39
Anthracene	23.3	25.9	11
Benzo(a)anthracene	169	172	2
Benzo(a)pyrene	267	230	15
Benzo(b)fluoranthene	378	342	10
Benzo(e)pyrene	250	220	13
Benzo(g,h,i)perylene	179	175	2
Benzo(k)fluoranthene	279	261	7
Biphenyl	1.13	1.29	13
Chrysene	127	131	3
Dibenzo(a,h)anthracene	114	106	7
Dibenzothiophene	2.56	2.85	11
Fluoranthene	137	140	2
Fluorene	3.39	4.8	34
Indeno(1,2,3-cd)pyrene	360	364	1
Naphthalene	5.77	6.24	8

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
Perylene	38.9	34	13
Phenanthrene	28	34.1	20
Pyrene	176	220	22

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, DUP RPD, LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 187003-010

Sample	Compound	Flag	A or P	Reason (Code)
B18-10133	Benzo(a)anthracene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10133	Naphthalene 1-Methylnaphthalene	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10133	Anthracene Chrysene Dibenzo(a,h)anthracene Dibenzothiophene Fluoranthene Phenanthrene Pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Biphenyl Naphthalene 2,6-Dimethylnaphthalene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Benzo(a)anthracene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Fluoranthene Indeno(1,2,3-cd)pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Benzo(k)fluoranthene	J (all detects)	A	Certified reference material (%R) (LP)

Sample	Compound	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 187003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 187003-010

No Sample Data Qualified in this SDG

LDC #: 45128E2b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-010 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: JV

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	A	
IX.	Laboratory control samples LCS/LCSD	A	LCS/D. CRM
X.	Field duplicates	N	D=5+6 R=3+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10133MS	56689MS	Sediment	07/26/18

LDC #: 45128E2b **VALIDATION COMPLETENESS WORKSHEET** Date: 6/30/19
SDG #: 1807003-010 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 1
2nd Reviewer: JV6

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

14	B18-10133MSD	56689MSD	Sediment	07/26/18
15	B18-10133DUP	56689DUP	Sediment	07/26/18
16				
17				
18				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. ~~2,3,6-~~ 1,6,7-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128z->b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JR6

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	13/14	CCC	208 (50-150)	234 50-150	( )	5 (lots)	lots/A(HM)
		GGG	162 ( )	170 ( )	( )		
		KKK	173 ( )	178 ( )	( )		
		NNN	188 ( )	208 ( )	( )		
		S	45 ( )	37 ( )	( )		
		TTT	( )	49 ( )	( )		
		YY	( )	159 ( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	15	VV	( )	( )	45 (≤25)	5 (lots)	lots/A(HD)
		DDD	( )	( )	30 ( )		
		KKK	( )	( )	30 ( )		
		AAAA	( )	( )	44 ( )		
		YY	( )	( )	41 ( )		
		UU	( )	( )	35 ( )		
		ZZ	( )	( )	31 ( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Privileged and Confidential

LDC #: 45128C-b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5668-BS1/ ~~BS2~~	TTT	59 (70-130)	57 (70-130)	( )	All (dets)	J (HL) A (LL)
			W	63 ( )	60 ( )	( )		
			~~44~~	67 ( )	66 ( )	( )		
			~~ZZZZ~~	64 ( )	62 ( )	( )		
			S	51 ( )	49 ( )	( )		
			XXX	( )	68 ( )	( )		
			CCC	196 ( )	200 ( )	( )		dets J (HL)
			~~GGG~~	147 ( )	148 ( )	( )		
			~~HHH~~	142 ( )	147 ( )	( )		
			YY	131 ( )	( )	( )		
			NN	156 ( )	163 ( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		5668-CRM1 (SRM1944)	HHH	41 (60-140)	( )	( )	All (dets)	J (N) A (LL)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

LDC#: 45128E2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: CL
2nd Reviewer: _____

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/g)		RPD
	3	6	
YYY	3.69	5.7	43
TTT	2.11	3.02	35
HHHH	8.14	9.75	18
XXX	2.91	4.06	33
W	4.51	7.13	45
GG	1.72	1.37	23
DD	10.4	15.5	39
VV	23.3	25.9	11
CCC	169	172	2
III	267	230	15
GGG	378	342	10
WWW	250	220	13
LLL	179	175	2
HHH	279	261	7
EEEE	1.13	1.29	13
DDD	127	131	3
KKK	114	106	7
AAAA	2.56	2.85	11
YY	137	140	2
NN	3.39	4.8	34
JJJ	360	364	1
S	5.77	6.24	8
ZZZ	38.9	34	13
UU	28	34.1	20
ZZ	176	220	22

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	PBDE 183 PBDE 190 PBDE 209	40 (50-150) 23 (50-150) 5 (50-150)	- 34 (50-150) 15 (50-150)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	PBDE 190 PBDE 209	39 (≤25) 100 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56681-BS1/BS2 (All samples in SDG 1807003-010)	PBDE 190 PBDE 209	67 (70-130) 22 (70-130)	61 (70-130) 17 (70-130)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
PBDE209	5.11	24.2	130

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-010

Sample	Compound	Flag	A or P	Reason (Code)
B18-10133	PBDE 183 PBDE 190 PBDE 209	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	PBDE 190 PBDE 209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E2c

SDG #: 1807003-010

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/24/19

Page: 1 of 2

Reviewer: Q

2nd Reviewer: JVG

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /BMP	N/A	
IX.	Laboratory control samples /CRM	N/A	LCS/D. CRM
X.	Field duplicates	N	D=5+6 R=3+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10133MS	56689MS	Sediment	07/26/18

LDC #: 45128E2c **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-010 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

14	B18-10133MSD	56689MSD	Sediment	07/26/18
15	B18-10133DUP	56689DUP	Sediment	07/26/18
16				
17				
18				

Notes:

LDC #: 45128C2C

Page: 1 of 1
Reviewer:
2nd Reviewer:

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	13/14	PBDE 183	40 (50-150)	( )	( )	5 (ND)	J/UJ/A (<M)
		190	23 (↓)	34 (50-150)	( )		↓
		209	5 (↓)	15 (↓)	( )		↓
		190	( )	( )	39 (≤25)		Jdets/A (HD)
		209	( )	( )	100 (↓)		↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 45128E2C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56681-BS1/	PBDE190	67 (70-130)	61 (70-130)	( )	All (dets+ND)	J/UJ/P (ll)
		-BS2	209	22 (↓)	17 (↓)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC#: 45128E2c

VALIDATION FINDINGS WORKSHEET
Field Replicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: _____

METHOD: GC/MS PBDE

Compound	Concentration (ng/g)		RPD
	3	6	
PBDE209	5.11	24.2	130

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-010

Sample	Compound	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E2d **VALIDATION COMPLETENESS WORKSHEET** Date: 5/20/19
SDG #: 1807003-010 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: SVG

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates MS/D	A/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D=5+6 R=3+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10133MS	56689MS	Sediment	07/26/18

LDC #: 45128E2d

SDG #: 1807003-010

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 4/24/19

Reviewer:

2nd Reviewer: JVR

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

	Client ID	Lab ID	Matrix	Date
14	B18-10133MSD	56689MSD	Sediment	07/26/18
15	B18-10133DUP	56689DUP	Sediment	07/26/18
16				
17				
18				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	Prallethrin	3 (50-150)	4 (50-150)	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	Prallethrin	29 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
Danitol (Fenpropathrin)	0.5U	1.89	Not calculable

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-010

Sample	Compound	Flag	A or P	Reason (Code)
B18-10133	Prallethrin	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E2e

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

SDG #: 1807003-010

Page: 1 of 2

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer:

2nd Reviewer:

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates (OUT)	N/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D = 5,6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10133MS	56689MS	Sediment	07/26/18

LDC #: 45128E2e **VALIDATION COMPLETENESS WORKSHEET** Date: 5/29/19
SDG #: 1807003-010 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JM

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

	Client ID	Lab ID	Matrix	Date
14	B18-10133MSD	56689MSD	Sediment	07/26/18
15	B18-10133DUP	56689DUP	Sediment	07/26/18
16				
17				
18				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				

LDC #: 45088E2e

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	13/14	L	3 (50-150)	4 (50-150)	( )	5 (ND)	J/UJ/A (<M)
		L	( )	( )	29 (≤25)		J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#: 45128E2e

VALIDATION FINDINGS WORKSHEET
Field Replicates

Reviewer: CN
2nd Reviewer: _____

METHOD: GC/MS Pyrethroids

Compound	Concentration (ng/g)		RPD
	3	6	
F	0.5U	1.89	NC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	Endosulfan I	0 (50-150)	0 (50-150)	R (all non-detects)	A
B18-10133MS/MSD (B18-10133)	Endosulfan II Endrin aldehyde	13 (50-150) 18 (50-150)	13 (50-150) 29 (50-150)	UJ (all non-detects) UJ (all non-detects)	A

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	Methoxychlor Perthane	169 (50-150) 152 (50-150)	182 (50-150) 158 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	Endrin aldehyde	47 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56681-BS1/BS2 (All samples in SDG 1807003-010)	Endosulfan I	2 (70-130)	2 (70-130)	R (all non-detects)	P
56681-BS1/BS2 (All samples in SDG 1807003-010)	Endosulfan II Endrin aldehyde alpha-Chlordane cis-Nonachlor	15 (70-130) 10 (70-130) - -	15 (70-130) 30 (70-130) 68 (70-130) 68 (70-130)	J (all detects) UJ (all non-detects)	P
56681-BS1/BS2 (All samples in SDG 1807003-010)	Methoxychlor Perthane	153 (70-130) 136 (70-130)	159 (70-130) 135 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56681-BS1/BS2 (All samples in SDG 1807003-010)	Endrin aldehyde	100 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
4,4'-DDD	0.5U	2.57	Not calculable
4,4'-DDE	2.17	2.15	1
gamma-Chlordane	0.377	0.347	8

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to MS/MSD %R and LCS/LCSD %R, data were rejected in twelve samples.

Due to MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-010

Sample	Compound	Flag	A or P	Reason (Code)
B18-10133	Endosulfan I	R (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10133	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Endosulfan II Endrin aldehyde alpha-Chlordane cis-Nonachlor	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E3a

SDG #: 1807003-010

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/9/19

Page: 1 of 2

Reviewer:

2nd Reviewer:

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	SW/A	
IX.	Laboratory control samples LCS/LCSD	SW/A	LCS/D. only
X.	Field duplicates	SW	~~D=5+6~~ R=3+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10133MS	56689MS	Sediment	07/26/18

LDC #: 45128E3a

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-010

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/29/19

Page: 2 of 3

Reviewer:

2nd Reviewer: JM

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

14	B18-10133MSD	56689MSD	Sediment	07/26/18
15	B18-10133DUP	56689DUP	Sediment	07/26/18
16				
17				
18				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45628B39

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	13/14	H	0 (50-150)	0 (50-150)	( )	5 (ND)	J/R/A (LM)
		L	13 ( )	13 ( )	( )		J/UJ/A
		R	18 ( )	29 ( )	( )		↓
		P	189 ( )	182 ( )	( )		J dets/A (HM)
		Perthane	152 ( )	158 ( )	( )		↓ ↓
		R	( )	( )	47 (≤25)		↓ (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 45178229

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56681-BS1/	H	2 (70-130)	2 (70-130)	( )	All (~~dets+~~ND)	J/R/P (LL)
		/-BS2	L	15 ( )	15 ( )	( )	(dets+ND)	J/UJ/P (LL)
			R	10 ( )	30 ( )	( )		↓
			P	153 ( )	159 ( )	( )	(ND)	J dets/P (HL)
			Perthane	136 (↓)	135 ( )	( )	↓	↓
			S	( )	68 ( )	( )		J/UJ/P (LL)
			PP	( )	68 (↓)	( )		↓
			R	( )	( )	100 (≤30)	(ND)	J dets/P (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC#: 45128E3a

VALIDATION FINDINGS WORKSHEET
Field Replicates

Page: 1 of 1
Reviewer: CK
2nd Reviewer: _____

METHOD: GC/MS Pesticides

Compound	Concentration (ng/g)		RPD
	3	6	
M	0.5U	2.57	NC
J	2.17	2.15	1
T	0.377	0.347	8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10133)	PCB-189	-	164 (50-150)	NA	-
	PCB-194	-	169 (50-150)		
	PCB-195	-	151 (50-150)		
	PCB-206	-	152 (50-150)		

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10133DUP (B18-10133)	PCB-099 PCB-180 PCB-209	37 (≤25) 35 (≤25) 27 (≤25)	J (all detects) J (all detects) J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56681-BS1/BS2 (All samples in SDG 1807003-010)	PCB-169 PCB-189 PCB-195	142 (70-130) 136 (70-130) -	152 (70-130) 151 (70-130) 132 (70-130)	NA	-
56681-BS1/BS2 (B18-10127 B18-20133)	PCB-194	144 (70-130)	149 (70-130)	J (all detects)	P
56681-BS1/BS2 (B18-10124 B18-10126 B18-10132 B18-10133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142)	PCB-194	144 (70-130)	149 (70-130)	NA	-
56681-BS1/BS2 (B18-10124 B18-10126 B18-10127 B18-20133 B18-10139 B18-10141)	PCB-206	144 (70-130)	144 (70-130)	J (all detects)	P
56681-BS1/BS2 (B18-10132 B18-10133 B18-10136 B18-10137 B18-10140 B18-10142)	PCB-206	144 (70-130)	144 (70-130)	NA	-

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56681-BS1/BS2 (B18-10124 B18-10126 B18-10127 B18-10133 B18-20133 B18-10137 B18-10139 B18-10141)	PCB-209	-	133 (70-130)	J (all detects)	P
56681-BS1/BS2 (B18-10132 B18-10136 B18-10140 B18-10142)	PCB-209	-	133 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56683-CRM1	PCB-105 PCB-128 PCB-156	36 (60-140) 36 (60-140) 39 (60-140)	All samples in SDG 1807003-010	J (all detects) UJ (all non-detects)	A

X. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
PCB-044	0.2U	0.998	Not calculable
PCB-049	1.23	1.32	7
PCB-052	1.76	2.86	48
PCB-066	1.7	2.6	42
PCB-070	1.25	2.51	67
PCB-074	0.2U	0.773	Not calculable

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
PCB-087	0.2U	1.7	Not calculable
PCB-095	3.55	6.09	53
PCB-099	2.53	4.56	57
PCB-101	5.39	9.35	54
PCB-105	0.649	0.572	13
PCB-110	3.98	7.81	65
PCB-118	3.04	5.95	65
PCB-128	1.88	3.44	59
PCB-138	7.3	12	49
PCB-141	0.7	1.38	65
PCB-149	5.9	9.1	43
PCB-151	2.25	3.14	33
PCB-153	7.55	12.1	46
PCB-156	0.2U	2.38	Not calculable
PCB-158	0.73	1.06	37
PCB-167	0.573	1.21	71
PCB-168+132	1.12	1.8	47
PCB-170	2.03	2.36	15
PCB-174	2.24	3.39	41
PCB-177	1.65	3.03	59
PCB-180	6.66	12	57
PCB-183	1.86	2.6	33

Compound	Concentration (ng/g)		RPD
	B18-10127	B18-20133	
PCB-187	3.91	6.67	52
PCB-194	2.18	5.73	90
PCB-199(200)	0.25U	3.26	Not calculable
PCB-201	0.25U	0.379	Not calculable
PCB-203	0.25U	3.54	Not calculable
PCB-206	1.37	2.72	66
PCB-209	1.07	1.89	55

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to DUP RPD, LCS/LCSD and CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-010

Sample	Compound	Flag	A or P	Reason (Code)
B18-10133	PCB-099 PCB-180 PCB-209	J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10127 B18-20133	PCB-194	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10124 B18-10126 B18-10127 B18-20133 B18-10139 B18-10141	PCB-206	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10124 B18-10126 B18-10127 B18-10133 B18-20133 B18-10137 B18-10139 B18-10141	PCB-209	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	PCB-105 PCB-128 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E3b **VALIDATION COMPLETENESS WORKSHEET** Date: 8/21/19
SDG #: 1807003-010 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	SW	
IX.	Laboratory control samples LCS/LCSD	SW/SW	LCS/D. CRM
X.	Field duplicates	SW	D = [illegible] R3+6
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10133MS	56689MS	Sediment	07/26/18

LDC #: 45128E3b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-010 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: JVL

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

14	B18-10133MSD	56689MSD	Sediment	07/26/18
15	B18-10133DUP	56689DUP	Sediment	07/26/18
16				
17				
18				

Notes:

LDC #: 45128E3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: ______

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	13/14	PCB189	( )	164 (50-150)	( )	5 (ND)	J dets/A (HM)
		194	( )	169 ( )	( )		
		195	( )	151 ( )	( )		
		206	( )	152 ( )	( )	~~(dets)~~	
			( )	( )	( )		
			( )	( )	( )		
	15	PCB099	( )	( )	37 (≤25)	5 (dets)	J dets/A (HD)
		180	( )	( )	35 ( )		
		209	( )	( )	27 ( )	~~(ND)~~	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Privileged and Confidential

LDC #: 45182-36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: _____

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5668-BS1/-BS2	PCB169	142 (70-130)	152 (70-130)	( )	All (ND)	dets (HL)
			189	136 ( )	151 ( )	( )		
			194	144 ( )	149 ( )	( )	(dets=3,6)	
			195	( )	132 ( )	( )	(ND)	
			206	*144 ( )	144 ( )	( )	(dets=1-3,6,9,11)	
			209	( )	133 ( )	( )	(dets=1-3,5-6,8-9,11)	
				( )	( )	( )		
				( )	( )	( )		
		5683-CRM1	PCB105	36 (60-140)	( )	( )	All (dets+ND)	UJA (<P)
		(SRM1944)	128	36 ( )	( )	( )		
			156	39 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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LDC #: 45128E3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: QT
2nd reviewer:

METHOD: GC/MS PCB (EPA SW 846 Method 8270D)

Compound	Concentration (ng/g)		RPD
	3	6	
PCB044	0.2U	0.998	NC
PCB049	1.23	1.32	7
PCB052	1.76	2.86	48
PCB066	1.7	2.6	42
PCB070	1.25	2.51	67
PCB074	0.2U	0.773	NC
PCB087	0.2U	1.7	NC
PCB095	3.55	6.09	53
PCB099	2.53	4.56	57
PCB101	5.39	9.35	54
PCB105	0.649	0.572	13
PCB110	3.98	7.81	65
PCB118	3.04	5.95	65
PCB128	1.88	3.44	59
PCB138	7.3	12	49
PCB141	0.7	1.38	65
PCB149	5.9	9.1	43
PCB151	2.25	3.14	33
PCB153	7.55	12.1	46
PCB156	0.2U	2.38	NC
PCB158	0.73	1.06	37
PCB167	0.573	1.21	71
PCB168+132	1.12	1.8	47
PCB170	2.03	2.36	15
PCB174	2.24	3.39	41
PCB177	1.65	3.03	59
PCB180	6.66	12	57
PCB183	1.86	2.6	33
PCB187	3.91	6.67	52
PCB194	2.18	5.73	90
PCB199(200)	0.25U	3.26	NC
PCB201	0.25U	0.379	NC

PCB203	0.25U	3.54	NC
PCB206	1.37	2.72	66
PCB209	1.07	1.89	55

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10124(SEM)	56685(SEM)	Sediment	07/26/18
B18-10126(SEM)	56686(SEM)	Sediment	07/26/18
B18-10127(SEM)	56687(SEM)	Sediment	07/26/18
B18-10132(SEM)	56688(SEM)	Sediment	07/26/18
B18-10133(SEM)	56689(SEM)	Sediment	07/26/18
B18-20133(SEM)	56690(SEM)	Sediment	07/26/18
B18-10136(SEM)	56691(SEM)	Sediment	07/27/18
B18-10137(SEM)	56692(SEM)	Sediment	07/27/18
B18-10139(SEM)	56693(SEM)	Sediment	07/27/18
B18-10140(SEM)	56694(SEM)	Sediment	07/27/18
B18-10141(SEM)	56695(SEM)	Sediment	07/27/18
B18-10142(SEM)	56696(SEM)	Sediment	07/27/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10133MS(SEM)	56689MS(SEM)	Sediment	07/26/18
B18-10133MSD(SEM)	56689MSD(SEM)	Sediment	07/26/18
B18-10133DUP(SEM)	56689DUP(SEM)	Sediment	07/26/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133	Mercury	169	28	J (all detects)	P
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Mercury	168	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142)	Barium Mercury	187 (75-125) -	183 (75-125) 126 (75-125)	J (all detects) J (all detects)	A

For B18-10133MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10133MS/MSD (B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142)	Iron	35 (≤25)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10133DUP (B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142)	Barium	55 (≤25)	-	J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
60151-CRM1	Aluminum	127 (42-124)	B18-10124 B18-10126 B18-10127	J (all detects)	A

XI. Field Replicates

Samples B18-10127 and B18-20133 and samples B18-10127(SEM) and B18-20133(SEM) were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/g)		RPD
	B18-10127	B18-20133	
Aluminum	35400	36700	4
Antimony	0.693	0.52	29
Arsenic	9.9	10.8	9
Barium	94	99.1	5
Beryllium	0.624	0.727	15
Cadmium	0.52	0.52	0
Chromium	69	71.6	4
Copper	196	202	3
Iron	33000	34700	5
Lead	367	57.1	146
Mercury	0.661	2.84	124

Analyte	Concentration (ug/g)		RPD
	B18-10127	B18-20133	
Nickel	28.5	18.3	44
Phosphorus	587	582	1
Selenium	0.501	0.546	9
Silver	1.56	1.34	15
Zinc	255	264	3

Analyte	Concentration (umol/g)		RPD
	B18-10127(SEM)	B18-20133(SEM)	
Copper	0.0591	0.0547	8
Lead	0.124	0.124	0
Nickel	0.0191	0.0185	3
Zinc	2.03	2.24	10

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, DUP RPD, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in twenty-four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-010

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Mercury	J (all detects)	P	Technical holding times (H)
B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Barium Mercury	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Iron	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Barium	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10124 B18-10126 B18-10127	Aluminum	J (all detects)	A	Certified reference material (%R) (HP)

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142 B18-10124(SEM) B18-10126(SEM) B18-10127(SEM) B18-10132(SEM) B18-10133(SEM) B18-20133(SEM) B18-10136(SEM) B18-10137(SEM) B18-10139(SEM) B18-10140(SEM) B18-10141(SEM) B18-10142(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E4a

SDG #: 1807003-010

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

Page: 1 of 2

Reviewer: G

2nd Reviewer: G

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCS/D CRM, (8,6) (17,18) 3 15
XI.	Field Duplicates	SW	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10124(SEM)	56685(SEM)	Sediment	07/26/18
14	B18-10126(SEM)	56686(SEM)	Sediment	07/26/18
15	B18-10127(SEM)	56687(SEM)	Sediment	07/26/18

LDC #: 45128E4a

SDG #: 1807003-010

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10132(SEM)	56688(SEM)	Sediment	07/26/18
17	B18-10133(SEM)	56689(SEM)	Sediment	07/26/18
18	B18-20133(SEM)	56690(SEM)	Sediment	07/26/18
19	B18-10136(SEM)	56691(SEM)	Sediment	07/27/18
20	B18-10137(SEM)	56692(SEM)	Sediment	07/27/18
21	B18-10139(SEM)	56693(SEM)	Sediment	07/27/18
22	B18-10140(SEM)	56694(SEM)	Sediment	07/27/18
23	B18-10141(SEM)	56695(SEM)	Sediment	07/27/18
24	B18-10142(SEM)	56696(SEM)	Sediment	07/27/18
25	B18-10133MS	56689MS	Sediment	07/26/18
26	B18-10133MSD	56689MSD	Sediment	07/26/18
27	B18-10133DUP	56689DUP	Sediment	07/26/18
28	B18-10133MS(SEM)	56689MS(SEM)	Sediment	07/26/18
29	B18-10133MSD(SEM)	56689MSD(SEM)	Sediment	07/26/18
30	B18-10133DUP(SEM)	56689DUP(SEM)	Sediment	07/26/18
31				
32				
33				

Notes:

LDC #: 45128E4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: Q

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-12		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
13-24		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC: 25-27		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
28-30		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr. Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128E4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

(H)

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-6	7/26/18	1/11/19	169	J/R/P	Det		
7-12	7/27/18	1/11/19	168	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128E4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 5
2nd Reviewer: 9

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ~~20~~ 25% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	25/26		Ba	187	183		4-12	JdetA (Det) (Hm)
			Fe			35 (≤25)		J UJ A (Hm)
			Hg		126			JdetA (Hm)

Comments: 25/26: Al, Fe >4X

LDC #: 45128E4a

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

CHD

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		27		Ba	55 (≤25)		4-12	J (J/A (Det))

Comments: _____

DUP.wpd

LDC #: 45128E4a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	601SI-CRM1		Al	127 (42-124)	1-3	Jdet (A CDet) (HP)

Comments: _____

LCS.4SW

LDC#: 45128E4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/g)		RPD
	3	6	
Aluminum	35400	36700	4
Antimony	0.693	0.52	29
Arsenic	9.9	10.8	9
Barium	94	99.1	5
Beryllium	0.624	0.727	15
Cadmium	0.52	0.52	0
Chromium	69	71.6	4
Copper	196	202	3
Iron	33000	34700	5
Lead	367	57.1	146
Mercury	0.661	2.84	124
Nickel	28.5	18.3	44
Phosphorus	587	582	1
Selenium	0.501	0.546	9
Silver	1.56	1.34	15
Zinc	255	264	3

LDC#: 45128E4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (umol/g)		RPD
	15	18	
Copper	0.0591	0.0547	8
Lead	0.124	0.124	0
Nickel	0.0191	0.0185	3
Zinc	2.03	2.24	10

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45128E4a.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-010

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10124	56685	Sediment	07/26/18
B18-10126	56686	Sediment	07/26/18
B18-10127	56687	Sediment	07/26/18
B18-10132	56688	Sediment	07/26/18
B18-10133	56689	Sediment	07/26/18
B18-20133	56690	Sediment	07/26/18
B18-10136	56691	Sediment	07/27/18
B18-10137	56692	Sediment	07/27/18
B18-10139	56693	Sediment	07/27/18
B18-10140	56694	Sediment	07/27/18
B18-10141	56695	Sediment	07/27/18
B18-10142	56696	Sediment	07/27/18
B18-10124DUP	56685DUP	Sediment	07/26/18
B18-10133MS	56689MS	Sediment	07/26/18
B18-10133MSD	56689MSD	Sediment	07/26/18
B18-10133DUP	56689DUP	Sediment	07/26/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133	Acid volatile sulfide	167 days	14 days	J (all detects)	A
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Acid volatile sulfide	166 days	14 days	J (all detects)	A
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133	Ammonia as N	165 days	28 days	J (all detects)	A
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Ammonia as N	164 days	28 days	J (all detects)	A
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133	Total nitrogen	172 days	28 days	J (all detects)	A
B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Total nitrogen	171 days	28 days	J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10133MS/MSD (All samples in SDG 1807003-010)	Acid volatile sulfide	42 (80-120)	41 (80-120)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Replicates

Samples B18-10127 and B18-20133 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	B18-10127	B18-20133	
Acid volatile sulfide	70.2 mg/Kg	154 mg/Kg	75

Analyte	Concentration		RPD
	B18-10127	B18-20133	
Ammonia as N	5.05 mg/Kg	5.33 mg/Kg	5
Percent solids	53.9 %	51.1 %	5
Total nitrogen	0.11 %	0.1 %	10
Total organic carbon	1.45 %	1.43 %	1

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-010	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-010

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Acid volatile sulfide	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10124 B18-10126 B18-10127 B18-10132 B18-10133 B18-20133 B18-10136 B18-10137 B18-10139 B18-10140 B18-10141 B18-10142	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-010

No Sample Data Qualified in this SDG

LDC #: 45128E6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19

SDG #: 1807003-010 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: C

2nd Reviewer: C

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3 D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	~~(3,6)~~ 3 (3,6)
X.	Sample result verification	N	3
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10124	56685	Sediment	07/26/18
2	B18-10126	56686	Sediment	07/26/18
3	B18-10127	56687	Sediment	07/26/18
4	B18-10132	56688	Sediment	07/26/18
5	B18-10133	56689	Sediment	07/26/18
6	B18-20133	56690	Sediment	07/26/18
7	B18-10136	56691	Sediment	07/27/18
8	B18-10137	56692	Sediment	07/27/18
9	B18-10139	56693	Sediment	07/27/18
10	B18-10140	56694	Sediment	07/27/18
11	B18-10141	56695	Sediment	07/27/18
12	B18-10142	56696	Sediment	07/27/18
13	B18-10124DUP	56685DUP	Sediment	07/26/18
14	B18-10133MS	56689MS	Sediment	07/26/18
15	B18-10133MSD	56689MSD	Sediment	07/26/18
16	B18-10133DUP	56689DUP	Sediment	07/26/18
17				

LDC #: 45128C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-12	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN [✓ TOC] Cr6+ ClO$_4$ [✓ AVS] [✓ %Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
QC:13	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$ [✓ %Solids] [✓ PS]
14,15	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN TOC Cr6+ ClO$_4$ [✓ AVS]
16	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN TOC Cr6+ ClO$_4$ [✓ AVS] [✓ N] [✓ TOC]
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$

Comments:

LDC #: 45128E6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/26/18	1/9/19	167	J/R/A (Det)	1/7/19	165	J/R/A (Det)
7-12	7/27/18	1/9/19	166	J/R/A (Det)	1/7/19	164	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/26/18				1/14/19	172	J/R/A (Det)
7-12	7/27/18				1/14/19	171	J/R/A (Det)

LDC #: 45128E6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the QAPP limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) within QAPP limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	14/15		AVS	42 (80-120)	41		All	J/UJ/A (Det) (CLM)

Comments:

LDC#: 45128E6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/Kg)		RPD
	3	6	
Acid volatile sulfides	70.2	154	75
Ammonia as N	5.05	5.33	5
Percent solids (%)	53.9	51.1	5
Total nitrogen (%)	0.11	0.1	10
TOC (%)	1.45	1.43	1

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45128E6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 187003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10144)	2-Methylnaphthalene	27 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10144DUP (B18-10144)	2,6-Dimethylnaphthalene	30 (≤25)	J (all detects)	A
	1-Methylnaphthalene	60 (≤25)	J (all detects)	
	2-Methylnaphthalene	34 (≤25)	J (all detects)	
	Acenaphthene	26 (≤25)	J (all detects)	
	Dibenzo(a,h)anthracene	29 (≤25)	J (all detects)	
	Fluorene	43 (≤25)	J (all detects)	
	Naphthalene	47 (≤25)	J (all detects)	

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	1-Methylnaphthalene	59 (70-130)	57 (70-130)	J (all detects)	P
	2-Methylnaphthalene	63 (70-130)	60 (70-130)	J (all detects)	
	Acenaphthene	67 (70-130)	66 (70-130)	J (all detects)	
	Biphenyl	64 (70-130)	62 (70-130)	J (all detects)	
	Naphthalene	51 (70-130)	49 (70-130)	J (all detects)	
	2,6-Dimethylnaphthalene	-	68 (70-130)	J (all detects)	
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	Benzo(a)anthracene	196 (70-130)	200 (70-130)	J (all detects)	P
	Benzo(b)fluoranthene	147 (70-130)	148 (70-130)	J (all detects)	
	Dibenzo(a,h)anthracene	142 (70-130)	147 (70-130)	J (all detects)	
	Fluoranthene	131 (70-130)	-	J (all detects)	
	Indeno(1,2,3-cd)pyrene	156 (70-130)	163 (70-130)	J (all detects)	
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	Anthracene	67 (70-130)	-	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
20910-CRM1 (SRM 1944)	Benzo(k)fluoranthene	41 (60-140)	B18-10034 B18-10035 B18-10036	J (all detects)	A
56744-CRM1 (SRM 1944)	Benzo(k)fluoranthene	41 (60-140)	B18-10143 B18-10144 B18-10039	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD RPD, DUP RPD, LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 187003-012

Sample	Compound	Flag	A or P	Reason (Code)
B18-10144	2-Methylnaphthalene	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10144	2,6-Dimethylnaphthalene 1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Dibenzo(a,h)anthracene Fluorene Naphthalene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10034 B18-10035 B18-10036	1-Methylnaphthalene 2-Methylnaphthalene Acenaphthene Biphenyl Naphthalene 2,6-Dimethylnaphthalene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10034 B18-10035 B18-10036	Benzo(a)anthracene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Fluoranthene Indeno(1,2,3-cd)pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10143 B18-10144 B18-10039	Anthracene	J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Benzo(k)fluoranthene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 187003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 187003-012

No Sample Data Qualified in this SDG

LDC #: 45128F2b

SDG #: 1807003-012

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

Page: 1 of 1

Reviewer: K

2nd Reviewer: JG

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	A/SW	
IX.	Laboratory control samples /CRM	SW	Lcs/D. /CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128F2b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	7/8	W	( )	( )	27 (≤25)	5 (dets)	J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
	9	XXX	( )	( )	30 (≤25)	5 (dets)	J dets/A (HD)
		TTT	( )	( )	60 ( )		
		W	( )	( )	34 ( )		
		GG	( )	( )	36 ( )		
		KKK	( )	( )	29 ( )		
		NN	( )	( )	43 ( )		
		S	( )	( )	47 ( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 45428F2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20907-BS1/-BS2	TTT	59 (70-130)	57 (70-130)	( )	1-3.MB	J/UA/A (LL)
			W	63 ( )	60 ( )	( )		
			44	67 ( )	66 ( )	( )		
			EEEE	64 ( )	62 ( )	( )		
			S	51 ( )	49 ( )	( )		
			XXX	( )	68 ( )	( )		
			CCC	196 ( )	200 ( )	( )		Hots/A (HL)
			FFF	147 ( )	148 ( )	( )		
			KKK	142 ( )	147 ( )	( )		
			YY	131 ( )	( )	( )		
			NN	156 ( )	163 ( )	( )		
				( )	( )	( )		
		20910-CRM1 (SRM 1944)	HHH	41 (60-140)	( )	( )	1-3.MB	J/UA/A (LP)
				( )	( )	( )		
				( )	( )	( )		
		56742-BS1/-BS2	VV	67 (70-130)	( )	( )	4-6.MB	J/UA/A (LL)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		56744-CRM1 (SRM 1944)	HHH	41 (60-140)	( )	( )	4-6.MB	J/UA/A (LP)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10144)	PBDE 209	28 (50-150)	31 (50-150)	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	PBDE 190 PBDE 209	67 (70-130) 22 (70-130)	61 (70-130) 17 (70-130)	UJ (all non-detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-012

Sample	Compound	Flag	A or P	Reason (Code)
B18-10144	PBDE 209	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10034 B18-10035 B18-10036	PBDE 190 PBDE 209	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F2c

SDG #: 1807003-012

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JVG

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW/A	
IX.	Laboratory control samples	SW/A	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10				

Notes:

LDC #: 45128F2C

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	7/8	PBDE209	28 (50-150)	31 (50-150)	( )	5 (ND)	J/UJ/A (<M)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #45128F2c

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 1
2nd Reviewer: M

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		2090T-BS1/	PBDE190	67 (70-130)	61 (70-130)	( )	1-3, MB (ND)	J/UJ/P (LL)
		-BS2	↓ 209	22 (↓)	17 (↓)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-012

Sample	Compound	Flag	A or P	Reason (Code)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F2d

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-012

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/31/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JM

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10144)	Cyhalothrin, total lambda Permethrin, cis-	157 (50-150) 154 (50-150)	- -	NA	-
B18-10144MS/MSD (B18-10144)	Prallethrin	28 (50-150)	-	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10144)	Deltamethrin/Tralomethrin Prallethrin	36 (≤25) 124 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-012

Sample	Compound	Flag	A or P	Reason (Code)
B18-10144	Prallethrin	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F2e

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-012

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	TW/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				

LDC #: 45378P2

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	7/8	D	157 (50-150)	( )	( )	5 (ND)	J dets/A (HM)
		J	154 ( )	( )	( )		↓
		L	28 ( )	( )	( )		J/UJ/A (<M)
		G	( )	( )	36 (≤25)		J dets/A (HD)
		L	( )	( )	124 (↓)		↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10144)	Endosulfan I Endosulfan II Endrin aldehyde	2 (50-150) 16 (50-150) 7 (50-150)	2 (50-150) 17 (50-150) 35 (50-150)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
B18-10144MS/MSD (B18-10144)	Methoxychlor	159 (50-150)	160 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10144MS/MSD (B18-10144)	Endrin aldehyde	133 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	Endosulfan I	2 (70-130)	2 (70-130)	R (all non-detects)	P
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	Endosulfan II Endrin aldehyde alpha-Chlordane cis-Nonachlor	15 (70-130) 10 (70-130) - -	15 (70-130) 30 (70-130) 68 (70-130) 68 (70-130)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	Methoxychlor Perthane	150 (70-130) 136 (70-130)	159 (70-130) 135 (70-130)	NA	-
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	Endosulfan I	3 (70-130)	2 (70-130)	R (all non-detects)	P
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	Endosulfan II Endrin aldehyde alpha-BHC Hexachlorobenzene	15 (70-130) 12 (70-130) 67 (70-130) 67 (70-130)	15 (70-130) 21 (70-130) - -	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	Methoxychlor Perthane	143 (70-130) -	146 (70-130) 134 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	Endosulfan I Endrin aldehyde	40 (≤30) 55 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56744-CRM1	gamma-Chlordane	159 (60-140)	B18-10143 B18-10144 B18-10039	NA	-

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in six samples.

Due to MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-012

Sample	Compound	Flag	A or P	Reason (Code)
B18-10144	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10034 B18-10035 B18-10036	Endosulfan II Endrin aldehyde alpha-Chlordane cis-Nonachlor	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10143 B18-10144 B18-10039	Endosulfan II Endrin aldehyde alpha-BHC Hexachlorobenzene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F3a

SDG #: 1807003-012

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/31/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
IX.	Laboratory control samples /CRM	SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45128F3a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	7/8	H	2 (50-150)	2 (50-150)	( )	5 (ND)	J/UJ/A (<M)
		L	16 ( )	17 ( )	( )		
		R	7 ( )	35 ( )	( )		
		P	159 ( )	160 ( )	( )		J dets/A (HM)
		~~Perthane~~	~~149~~ ( )	( )	( )		
		R	( )	( )	133 (≤25)		J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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Privileged and Confidential

LDC #: 45138F3a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer: VG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20907-BS1/BS2	H	2 (70-130)	2 (70-130)	( )	1-3. MB (ND)	J (R, P) (LL)
			L	15 ( )	15 ( )	( )		J (U, P)
			R	10 ( )	30 ( )	( )		↓
			P	150 ( )	159 ( )	( )		J (dets, P) (HL)
			Perthane	136 ( )	135 ( )	( )		↓
			S	( )	68 ( )	( )		J (U, P) (LL)
			PP	( )	68 ( )	( )		↓
				( )	( )	( )		
				( )	( )	( )		
		56742-BS1/BS2	H	3 (70-130)	2 (70-130)	( )	4-6. MB (ND)	J (R, P) (LL)
			L	15 ( )	15 ( )	( )		J (U, P)
			R	12 ( )	21 ( )	( )		↓
			A	67 ( )	( )	( )		↓
			P	143 ( )	146 ( )	( )		J (dets, P) (HL)
			Perthane	( )	134 ( )	( )		↓
			H	( )	( )	40 (≤30)		J (dets, P) (HD)
			R	( )	( )	55 ( )		↓
			FF	67 (70-130)	( )	( )		J (U, P) (LL)
				( )	( )	( )		
		56744-CRM1 (SRM 1944)	T	159 (60-140)	( )	( )	4-6. MB (ND)	J (dets, A) (HP)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 30, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10144DUP (B18-10144)	PCB-099	28 (≤25)	J (all detects)	A
	PCB-118	35 (≤25)	J (all detects)	
	PCB-138	30 (≤25)	J (all detects)	
	PCB-158	29 (≤25)	J (all detects)	
	PCB-177	29 (≤25)	J (all detects)	
	PCB-206	28 (≤25)	J (all detects)	

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20907-BS1/BS2 (B18-10034 B18-10035 B18-10036)	PCB-169 PCB-189 PCB-194 PCB-206 PCB-195 PCB-209	142 (70-130) 136 (70-130) 144 (70-130) 144 (70-130) - -	152 (70-130) 151 (70-130) 149 (70-130) 144 (70-130) 132 (70-130) 133 (70-130)	NA	-
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	PCB-156 PCB-169 PCB-189 PCB-194 PCB-195	131 (70-130) 153 (70-130) 146 (70-130) 165 (70-130) 133 (70-130)	- 148 (70-130) 144 (70-130) 161 (70-130) 134 (70-130)	NA	-
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	PCB-180 PCB-206 PCB-209	135 (70-130) 158 (70-130) 135 (70-130)	131 (70-130) 147 (70-130) -	J (all detects) J (all detects) J (all detects)	A
56742-BS1/BS2 (B18-10143 B18-10144 B18-10039)	PCB-003 PCB-005	60 (70-130) 67 (70-130)	- -	UJ (all non-detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
20910-CRM1	PCB-105 PCB-128 PCB-156	36 (60-140) 36 (60-140) 39 (60-140)	B18-10034 B18-10035 B18-10036	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
56744-CRM1	PCB-105 PCB-118 PCB-128 PCB-156	41 (60-140) 53 (60-140) 55 (60-140) 41 (60-140)	B18-10143 B18-10144 B18-10039	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to DUP RPD, LCS/LCSD and CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-012

Sample	Compound	Flag	A or P	Reason (Code)
B18-10144	PCB-099 PCB-118 PCB-138 PCB-158 PCB-177 PCB-206	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10143 B18-10144 B18-10039	PCB-180 PCB-206 PCB-209	J (all detects) J (all detects) J (all detects)	A	Laboratory control samples (%R) (HL)
B18-10143 B18-10144 B18-10039	PCB-003 PCB-005	UJ (all non-detects) UJ (all non-detects)	A	Laboratory control samples (%R) (LL)
B18-10034 B18-10035 B18-10036	PCB-105 PCB-128 PCB-156	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10143 B18-10144 B18-10039	PCB-105 PCB-118 PCB-128 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F3b

SDG #: 1807003-012

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/24/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JVB

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	A/SW	
IX.	Laboratory control samples /CRM	SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10				

Notes:

LDC #: 45628F36

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: ~~~
2nd Reviewer: ~~~

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

[✓ Y] N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	9	PCB099	( )	( )	28 (≤25)	5 (dets)	J dets/A (HD)
		118	( )	( )	35 ( )		
		138	( )	( )	30 ( )		
		158	( )	( )	29 ( )		
		177	( )	( )	29 ( )		
		206	( )	( )	28 ( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 45128F36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		2090T-BS1/-BS2	PCB169	142 (70-130)	152 (70-130)	( )	1-3, MB (ND)	dets J (HL)
			189	136 ( )	151 ( )	( )		
			194	144 ( )	149 ( )	( )		
			206	144 ( )	144 ( )	( )		
			195	( )	132 ( )	( )		
			209	( )	133 ( )	( )		
				( )	( )	( )		
		20910-CRM1 (CRM1944)	PCB105	36 (60-140)	( )	( )	1-3, MB (ND)	J (LH) A (LP)
			128	36 ( )	( )	( )		
			156	39 ( )	( )	( )		
				( )	( )	( )		
		5GT42-BS1/-BS2	PCB156	131 (70-130)	( )	( )	4-6, MB (ND)	dets J (HL)
			169	153 ( )	148 (70-130)	( )		
			180	135 ( )	131 ( )	( )	(dets=4-6)	
			189	146 ( )	144 ( )	( )	(ND)	
			194	165 ( )	161 ( )	( )		
			195	133 ( )	134 ( )	( )		
			206	158 ( )	147 ( )	( )	(dets=4-6)	
			209	135 ( )	( )	( )	(dets=4-6)	
				( )	( )	( )		
		5GT44-CRM1 (CRM1944)	PCB105	41 (60-140)	( )	( )	4-6, MB (dets+ND)	J (LH) A (LP)
			118	53 ( )	( )	( )		
			128	55 ( )	( )	( )		
			156	41 ( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

LDC #: 45128F3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56742-BS1/	FCB003	60 (70-130)	( )	( )	4-6. MB(ND)	J/UJ/P (LL)
		-BSD	↓ 005	67 (↓)	( )	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10034(SEM)	56746(SEM)	Sediment	07/30/18
B18-10035(SEM)	56747(SEM)	Sediment	07/30/18
B18-10036(SEM)	56748(SEM)	Sediment	07/30/18
B18-10143(SEM)	56749(SEM)	Sediment	07/30/18
B18-10144(SEM)	56750(SEM)	Sediment	07/30/18
B18-10039(SEM)	56751(SEM)	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18
B18-10144MS(SEM)	56750MS(SEM)	Sediment	07/30/18
B18-10144MSD(SEM)	56750MSD(SEM)	Sediment	07/30/18
B18-10144DUP(SEM)	56750DUP(SEM)	Sediment	07/30/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Mercury	165	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For B18-10144MS/MSD(SEM), no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10144MS/MSD(SEM) (B18-10035 B18-10036 B18-10143 B18-10144 B18-10039)	Iron	200 (≤25)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
56743-CRM1	Aluminum	139 (42-124)	B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	J (all detects)	A

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD RPD, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in twelve samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-012

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Mercury	J (all detects)	P	Technical holding times (H)
B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Iron	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Aluminum	J (all detects)	A	Certified reference material (%R) (HP)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039 B18-10034(SEM) B18-10035(SEM) B18-10036(SEM) B18-10143(SEM) B18-10144(SEM) B18-10039(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F4a

SDG #: 1807003-012

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

Page: 1 of 2

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCS/D, CRM
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10034(SEM)	56746(SEM)	Sediment	07/30/18
8	B18-10035(SEM)	56747(SEM)	Sediment	07/30/18
9	B18-10036(SEM)	56748(SEM)	Sediment	07/30/18
10	B18-10143(SEM)	56749(SEM)	Sediment	07/30/18
11	B18-10144(SEM)	56750(SEM)	Sediment	07/30/18
12	B18-10039(SEM)	56751(SEM)	Sediment	07/30/18
13	B18-10144MS	56750MS	Sediment	07/30/18
14	B18-10144MSD	56750MSD	Sediment	07/30/18
15	B18-10144DUP	56750DUP	Sediment	07/30/18

LDC #: 45128F4a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-012 Level II Page: 2 of 3
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10144MS(SEM)	56750MS(SEM)	Sediment	07/30/18
17	B18-10144MSD(SEM)	56750MSD(SEM)	Sediment	07/30/18
18	B18-10144DUP(SEM)	56750DUP(SEM)	Sediment	07/30/18
19				
20				
21				

Notes:

LDC #: 45128F6a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-6		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
7-12		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
QC:13-15		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___ ___
16-18		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128F4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
All	7/30/18	1/11/19	165	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128F4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 4 of 4
Reviewer:
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	16/17		Fe			20(CSES)	2-6	J (LOQ/A (Det) (HD)

Comments: 16/17: AFJ Fe 74X

LDC #: 45128F4

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: G
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	Analyte %R (limits)	%R Associated Samples	Qualifications
	567430RM2			Al	139 (42-124)	J (det) A (det) (HP)
					↓	
					Associate with: 2-6	

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-012

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10034	56746	Sediment	07/30/18
B18-10035	56747	Sediment	07/30/18
B18-10036	56748	Sediment	07/30/18
B18-10143	56749	Sediment	07/30/18
B18-10144	56750	Sediment	07/30/18
B18-10039	56751	Sediment	07/30/18
B18-10144MS	56750MS	Sediment	07/30/18
B18-10144MSD	56750MSD	Sediment	07/30/18
B18-10144DUP	56750DUP	Sediment	07/30/18
B18-10039DUP	56751DUP	Sediment	07/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
All samples in SDG 1807003-012	Acid volatile sulfide	163 days	14 days	J (all detects)	A
All samples in SDG 1807003-012	Ammonia as N	157 days	28 days	J (all detects)	A
All samples in SDG 1807003-012	Total nitrogen	168 days	28 days	J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10144MS/MSD (All samples in SDG 1807703-012)	Acid volatile sulfide	46 (80-120)	49 (80-120)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-012	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-012

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Acid volatile sulfide	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10034 B18-10035 B18-10036 B18-10143 B18-10144 B18-10039	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-012

No Sample Data Qualified in this SDG

LDC #: 45128F6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19

SDG #: 1807003-012 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: a

2nd Reviewer: A

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D, CRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10034	56746	Sediment	07/30/18
2	B18-10035	56747	Sediment	07/30/18
3	B18-10036	56748	Sediment	07/30/18
4	B18-10143	56749	Sediment	07/30/18
5	B18-10144	56750	Sediment	07/30/18
6	B18-10039	56751	Sediment	07/30/18
7	B18-10144MS	56750MS	Sediment	07/30/18
8	B18-10144MSD	56750MSD	Sediment	07/30/18
9	B18-10144DUP	56750DUP	Sediment	07/30/18
10	B18-10039DUP	56751DUP	Sediment	07/30/18
11				
12				
13				
14				

Notes:

LDC #: 45128F6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-6	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN [✓ TOC] Cr6+ ClO$_4$ [✓ AVS] [✓ %Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
QC:7-8	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN TOC Cr6+ ClO$_4$ [✓ AVS]
9	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN TOC Cr6+ ClO$_4$ [✓ AVS] [✓ N]
10	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$ [✓ PS]
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$

Comments:

LDC #: 45128F6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CH
2nd reviewer: CH

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	7/30/18	1/9/19	163	J/R/A (Det)	1/3/19	157	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	7/30/18				1/14/19	168	J/R/A (Det)

LDC #: 45128F6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the QAPP limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) within QAPP limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	7/8		AVS	46 (80-120)	49		All	J/UJ/A (Det) (CLM)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
56805-BS1 (All samples in SDG 1807003-014)	Anthracene	67 (70-130)	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56807-CRM1 (SRM 1944)	Benzo(k)fluoranthene	41 (60-140)	All samples in SDG 1807003-014)	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-014

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Anthracene	J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Benzo(k)fluoranthene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G2b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-014 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 9
2nd Reviewer: JV6

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	MN	LCS/B . CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12				
13				

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45289F2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56805-BS1	VV	67 (70-130)	( )	( )	All (dets)	J/UJ/P (ll)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		56807-CRM1	HHH	41 (60-140)	( )	( )	All (dets)	J/UJ/A (lp)
		(SRM 1944)		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-014

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G2c

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-014

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples LCS/LCSD	A	LCS/D. ORM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12				
13				

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-014

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G2d **VALIDATION COMPLETENESS WORKSHEET** Date: 8/30/19
SDG #: 1807003-014 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 1
2nd Reviewer: JW

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12				
13				

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-014

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G2e **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-014 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 1
2nd Reviewer: 2

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12				
13				

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56805-BS1/BS2 (All samples in SDG 1807003-014)	alpha-BHC Endosulfan II Endrin aldehyde Hexachlorobenzene	67 (70-130) 15 (70-130) 12 (70-130) 67 (70-130)	- 15 (70-130) 21 (70-130) -	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
56805-BS1/BS2 (All samples in SDG 1807003-014)	Endosulfan I	3 (70-130)	2 (70-130)	R (all non-detects)	P
56805-BS1/BS2 (All samples in SDG 1807003-014)	Methoxychlor Perthane	143 (70-130) -	146 (70-130) 134 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56805-BS1/BS2 (All samples in SDG 1807003-014)	Endosulfan I Endrin aldehyde	40 (≤30) 55 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56807-CRM1	gamma-Chlordane	159 (60-140)	B18-10037 B18-10038 B18-10041 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	NA	-
56807-CRM1	gamma-Chlordane	159 (60-140)	B18-10179	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in eleven samples.

Due to LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-014

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	alpha-BHC Endosulfan II Endrin aldehyde Hexachlorobenzene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10179	gamma-Chlordane	J (all detects)	A	Certified reference material (%R) (HP)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G3a **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-014 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JMe

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12				
13				

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45128F3a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SL805-BS1/BS2	A	67 (70-130)	( )	( )	All (ND)	J (U) P (LR)
			L	15	15 (70-130)	( )		
			R	12	21	( )		J R P
			H	3	2	( )		J (U) P
			FF	67	( )	( )		J (U) P
			P	143	146	( )		J detects P (HL)
			Perthane	( )	134	(30)		
			H	( )	( )	40 (≤ 25)		J detects P (HD)
			R	( )	( )	55		
				( )	( )	( )		
		SL80T-CRM1 (SRM 1944)	T	159 (60-140)	( )	( )	All (dets=4)	J detects A (HP)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56805-BS1/BS2 (All samples in SDG 1807003-014)	PCB-003 PCB-005	60 (70-130) 67 (70-130)	- -	UJ (all non-detects) UJ (all non-detects)	P
56805-BS1/BS2 (All samples in SDG 1807003-014)	PCB-156 PCB-169 PCB-189 PCB-194 PCB-195 PCB-206 PCB-209	131 (70-130) 153 (70-130) 146 (70-130) 165 (70-130) 133 (70-130) 158 (70-130) 135 (70-130)	- 148 (70-130) 144 (70-130) 161 (70-130) 134 (70-130) 147 (70-130) -	NA	-
56805-BS1/BS2 (B18-10037 B18-10180 B18-10181)	PCB-180	135 (70-130)	131 (70-130)	J (all detects)	P
56805-BS1/BS2 (B18-10038 B18-10041 B18-10179 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088)	PCB-180	135 (70-130)	131 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
56807-CRM1	PCB-105 PCB-118 PCB-156	41 (60-140) 53 (60-140) 41 (60-140)	All samples in SDG 1807003-014	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD and CRM %R and results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-014

Sample	Compound	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	PCB-003 PCB-005	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10037 B18-10180 B18-10181	PCB-180	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	PCB-105 PCB-118 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-014

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 8/30/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JW

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples / CRM	SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12				
13				

LDC #: 45284J6

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: CJ
2nd Reviewer: JVS

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56805-BS1/-BS2	PCB003	60 (70-130)	( )	( )	All (ND)	J (all) A (all)
			005	67 ( )	( )	( )		
			156	131 ( )	( )	( )		J (all) A (all)
			169	153 ( )	148 (70-130)	( )		
			180	135 ( )	131 ( )	( )	det=1,5-6) (ND)	
			189	146 ( )	144 ( )	( )		
			194	165 ( )	161 ( )	( )		
			195	133 ( )	134 ( )	( )		
			206	158 ( )	147 ( )	( )		
			209	135 ( )	( )	( )		
				( )	( )	( )		
		5680T-CRM1 (SRM 1944)	PCB105	41 (60-140)	( )	( )	All (det=ND)	J (all) A (all)
			118	53 ( )	( )	( )		
			156	41 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18
B18-10037(SEM)	56809(SEM)	Sediment	07/31/18
B18-10038(SEM)	56810(SEM)	Sediment	07/31/18
B18-10041(SEM)	56811(SEM)	Sediment	07/31/18
B18-10179(SEM)	56812(SEM)	Sediment	07/31/18
B18-10180(SEM)	56813(SEM)	Sediment	07/31/18
B18-10181(SEM)	56814(SEM)	Sediment	07/31/18
B18-10042(SEM)	56815(SEM)	Sediment	08/01/18
B18-10085(SEM)	56816(SEM)	Sediment	08/01/18
B18-10086(SEM)	56817(SEM)	Sediment	08/01/18
B18-10087(SEM)	56818(SEM)	Sediment	08/01/18
B18-10088(SEM)	56819(SEM)	Sediment	08/01/18
B18-10181MS	56814MS	Sediment	07/31/18
B18-10181MSD	56814MSD	Sediment	07/31/18
B18-10181DUP	56814DUP	Sediment	07/31/18
B18-10181MS(SEM)	56814MS(SEM)	Sediment	07/31/18
B18-10181MSD(SEM)	56814MSD(SEM)	Sediment	07/31/18

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10181DUP(SEM)	56814DUP(SEM)	Sediment	07/31/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181	Mercury	164	28	J (all detects)	P
B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Mercury	163	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For B18-10181MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10181MS/MSD (B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088)	Aluminum Iron	67 (≤25) 200 (≤25)	J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
56806-CRM1	Aluminum Iron	136 158	B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	J (all detects) J (all detects)	A
601520CRM1	Aluminum Iron	139 157	B18-10037 B18-10038 B18-10041 B18-10179 B18-10180	J (all detects) J (all detects)	A

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD RPD, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in twenty-two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-014

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Mercury	J (all detects)	P	Technical holding times (H)
B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Aluminum Iron	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088 B18-10037 B18-10038 B18-10041 B18-10179 B18-10180	Aluminum Iron	J (all detects) J (all detects)	A	Certified reference material (%R) (HP)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088 B18-10037(SEM) B18-10038(SEM) B18-10041(SEM) B18-10179(SEM) B18-10180(SEM) B18-10181(SEM) B18-10042(SEM) B18-10085(SEM) B18-10086(SEM) B18-10087(SEM) B18-10088(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G4a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-014 Level II Page: 1 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCS/D, CRM
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12	B18-10037(SEM)	56809(SEM)	Sediment	07/31/18
13	B18-10038(SEM)	56810(SEM)	Sediment	07/31/18
14	B18-10041(SEM)	56811(SEM)	Sediment	07/31/18
15	B18-10179(SEM)	56812(SEM)	Sediment	07/31/18

LDC #: 45128G4a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-014 Level II Page: 2 of 2
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10180(SEM)	56813(SEM)	Sediment	07/31/18
17	B18-10181(SEM)	56814(SEM)	Sediment	07/31/18
18	B18-10042(SEM)	56815(SEM)	Sediment	08/01/18
19	B18-10085(SEM)	56816(SEM)	Sediment	08/01/18
20	B18-10086(SEM)	56817(SEM)	Sediment	08/01/18
21	B18-10087(SEM)	56818(SEM)	Sediment	08/01/18
22	B18-10088(SEM)	56819(SEM)	Sediment	08/01/18
23	B18-10181MS	56814MS	Sediment	07/31/18
24	B18-10181MSD	56814MSD	Sediment	07/31/18
25	B18-10181DUP	56814DUP	Sediment	07/31/18
26	B18-10181MS(SEM)	56814MS(SEM)	Sediment	07/31/18
27	B18-10181MSD(SEM)	56814MSD(SEM)	Sediment	07/31/18
28	B18-10181DUP(SEM)	56814DUP(SEM)	Sediment	07/31/18
29				
30				
31				

Notes:

LDC #: 45128G4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: Q

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-11		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
12-22		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC: 23-25		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
26-28		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 45128G4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: a
2nd reviewer: Q

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

(H)

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-6	7/31/18	1/11/19	164	J/R/P	Det		
7-11	8/1/18	1/11/19	163	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45126604a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

HD

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	23/24		Al			67 (≤25)	~~1-5~~ 6-11	J (all Det)
			Fe			200 ↓		↓

Comments: 23/24: Al, Fe +x

LDC #: 45128646

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	56806-CRM7		Al	136 (42-124)	6-11	J det (A (Det) HP
			Fe	158 (33-155)		
	6015a-CRM1		Al	139	1-5	
			Fe	157	J	

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-014

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10037	56809	Sediment	07/31/18
B18-10038	56810	Sediment	07/31/18
B18-10041	56811	Sediment	07/31/18
B18-10179	56812	Sediment	07/31/18
B18-10180	56813	Sediment	07/31/18
B18-10181	56814	Sediment	07/31/18
B18-10042	56815	Sediment	08/01/18
B18-10085	56816	Sediment	08/01/18
B18-10086	56817	Sediment	08/01/18
B18-10087	56818	Sediment	08/01/18
B18-10088	56819	Sediment	08/01/18
B18-10037MS	56809MS	Sediment	07/31/18
B18-10037MSD	56809MSD	Sediment	07/31/18
B18-10037DUP	56809DUP	Sediment	07/31/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181	Acid volatile sulfide Ammonia as N Total nitrogen	162 days 160 days 168 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A
B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Acid volatile sulfide Ammonia as N Total nitrogen	161 days 159 days 167 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-014	Analytes reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-014

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10037 B18-10038 B18-10041 B18-10179 B18-10180 B18-10181 B18-10042 B18-10085 B18-10086 B18-10087 B18-10088	Analytes reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-014

No Sample Data Qualified in this SDG

LDC #: 45128G6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-014 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3 D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D, CRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10037	56809	Sediment	07/31/18
2	B18-10038	56810	Sediment	07/31/18
3	B18-10041	56811	Sediment	07/31/18
4	B18-10179	56812	Sediment	07/31/18
5	B18-10180	56813	Sediment	07/31/18
6	B18-10181	56814	Sediment	07/31/18
7	B18-10042	56815	Sediment	08/01/18
8	B18-10085	56816	Sediment	08/01/18
9	B18-10086	56817	Sediment	08/01/18
10	B18-10087	56818	Sediment	08/01/18
11	B18-10088	56819	Sediment	08/01/18
12	B18-10037MS	56809MS	Sediment	07/31/18
13	B18-10037MSD	56809MSD	Sediment	07/31/18
14	B18-10037DUP	56809DUP	Sediment	07/31/18
15				

Notes:

LDC #: 45128G6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
H1	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ %Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:12,13	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
14	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4 [✓ %Solids]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128G6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: AG
2nd reviewer: AG

All circled dates have exceeded the technical holding time. (H)
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/31/18	1/9/19	162	J/R/A (Det)	1/7/19	160	J/R/A (Det)
7-11	8/1/18	1/9/19	161	J/R/A (Det)	1/7/19	159	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-6	7/31/18				1/15/19	168	J/R/A (Det)
7-11	8/1/18				1/15/19	167	J/R/A (Det)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-016)	Anthracene	67 (70-130)	-	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
57535-CRM1 (SRM 1944)	Benzo(k)fluoranthene	41 (60-140)	All samples in SDG 1807003-016)	J (all detects)	A

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
1,6,7-Trimethylnaphthalene	2.99036	2.809331	6
1-Methylnaphthalene	2.324625	1.852006	23
1-Methylphenanthrene	3.113301	3.156736	1
2,6-Dimethylnaphthalene	2.002984	1.927649	4
2-Methylnaphthalene	3.297661	3.295014	0
Acenaphthene	0.5443842	0.4131123	27
Acenaphthylene	0.9490548	0.8162883	15
Anthracene	2.13437	2.099126	2
Benzo(a)anthracene	12.79955	14.87139	15
Benzo(a)pyrene	22.64412	24.64431	8
Benzo(b)fluoranthene	22.47953	22.78465	1

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
Benzo(e)pyrene	21.50939	21.96691	2
Benzo(g,h,i)perylene	29.29789	28.84531	2
Benzo(k)fluoranthene	21.75439	23.67522	8
Biphenyl	0.6808496	0.7100799	4
Chrysene	23.30638	24.76834	6
Dibenzo(a,h)anthracene	4.580828	4.401746	4
Dibenzothiophene	1.502037	1.396281	7
Fluoranthene	30.62514	36.66845	18
Fluorene	2.084437	1.708983	20
Indeno(1,2,3-cd)pyrene	23.17154	24.24481	5
Naphthalene	3.634394	3.5898	1
Perylene	7.801467	7.522212	4
Phenanthrene	16.34855	17.55809	7
Pyrene	35.09925	39.58696	12

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-016

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Anthracene	J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10040 B18-10043 B18-10044 B18-20043	Benzo(k)fluoranthene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-016

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/23/19
Page: 1 of 1
Reviewer: 9
2nd Reviewer: JW

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	09
IX.	Laboratory control samples /CRM	SW	LCS/D
X.	Field duplicates	SW	D = 2+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128H2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: q
2nd Reviewer: WB

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5T533-BS1/ -BS1	VV	6T (70-130)	( )	( )	All (dets)	J/UJ/P (<<)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		5T535-CRM1 (SRM 1944)	HHH	41 (60-140)	( )	( )	All (dets)	J/UJ/A (<P)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC#: 45128H2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: JVB

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/g)		RPD
	2	4	
YYY	2.99036	2.809331	6
TTT	2.324625	1.852006	23
HHHH	3.113301	3.156736	1
XXX	2.002984	1.927649	4
W	3.297661	3.295014	0
GG	0.5443842	0.4131123	27
DD	0.9490548	0.8162883	15
VV	2.13437	2.099126	2
CCC	12.79955	14.87139	15
III	22.64412	24.64431	8
GGG	22.47953	22.78465	1
WWW	21.50939	21.96691	2
LLL	29.29789	28.84531	2
HHH	21.75439	23.67522	8
EEEE	0.6808496	0.7100799	4
DDD	23.30638	24.76834	6
KKK	4.580828	4.401746	4
AAAA	1.502037	1.396281	7
YY	30.62514	36.66845	18
NN	2.084437	1.708983	20
JJJ	23.17154	24.24481	5
S	3.634394	3.5898	1
ZZZ	7.801467	7.522212	4
UU	16.34855	17.55809	7
ZZ	35.09925	39.58696	12

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
PBDE099	0.334	0.446	29
PBDE209	1.56	0.1U	Not calculable

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-016

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H2c

SDG #: 1807003-016

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples / CRM	A	LCS/D. CRM
X.	Field duplicates	SW	D=2+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5				
6				
7				
8				

Notes:

LDC#: 45128H2c

VALIDATION FINDINGS WORKSHEET
Field Replicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: GMP

METHOD: GC/MS PBDE

Compound	Concentration (ng/g)		RPD
	2	4	
PBDE099	0.334	0.446	29
PBDE209	1.56	0.1U	NC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-016

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H2d **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-016 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: 2
2nd Reviewer: JM

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D = 2+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5				
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
Bifenthrin	2.62	2.88	9
Danitol (Fenpropathrin)	1.19	1.3	9

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-016

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H2e **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-016 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: JM

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D = 2+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				
M. Fenvalerate				

LDC#: 45128H2e

VALIDATION FINDINGS WORKSHEET
Field Replicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Pyrethroids

Compound	Concentration (ng/g)		RPD
	2	4	
B	2.62	2.88	9
F	1.19	1.3	9

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-016)	alpha-BHC Endosulfan II Endrin aldehyde Hexachlorobenzene	67 (70-130) 15 (70-130) 12 (70-130) 67 (70-130)	- 15 (70-130) 21 (70-130) -	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
57533-BS1/BS2 (All samples in SDG 1807003-016)	Endosulfan I	3 (70-130)	2 (70-130)	R (all non-detects)	P
57533-BS1/BS2 (All samples in SDG 1807003-016)	Methoxychlor Perthane	143 (70-130) -	146 (70-130) 134 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-016)	Endosulfan II Endrin aldehyde	40 (≤30) 55 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
57535-CRM1	gamma-Chlordane	159 (60-140)	All samples in SDG 1807003-016	NA	-

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
4,4'-DDE	1.56	1.38	12
4,4'-DDT	2.25	0.5U	Not calculable

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in four samples.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-016

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	alpha-BHC Endosulfan II Endrin aldehyde Hexachlorobenzene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10040 B18-10043 B18-10044 B18-20043	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H3a

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

SDG #: 1807003-016

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: T

2nd Reviewer: JVG

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	SW	LCS/D. CRM
X.	Field duplicates	SW	D = 2+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45138H3A

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: 9
2nd Reviewer: JVB

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		ST533-BS1/ -BS2	A	67 (70-130)	( )	( )	All (ND)	J (all)
			L	15 ( )	15 (70-130)	( )		
			R	12 ( )	21 ( )	( )		
			FF	67 ( )	( )	( )		
			H	3 ( )	2 ( )	( )		J R P
			P	143 ( )	146 ( )	( )		J detects (HL)
			Perthane	( )	134 ( )	( )		
			L	( )	( )	40 (≤30)		J detects (HD)
			R	( )	( )	55 ( )		
				( )	( )	( )		
				( )	( )	( )		
		ST535-CRM/ (SRM1944	T	159 (60-140)	( )	( )	All (ND)	J detects (HP)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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LDC#: 45128H3a

VALIDATION FINDINGS WORKSHEET
Field Replicates

Page: 1 of 1
Reviewer: SK
2nd Reviewer: JM

METHOD: GC/MS Pesticides

Compound	Concentration (ng/g)		RPD
	2	4	
J	1.56	1.38	12
O	2.25	0.5U	NC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-016)	PCB-003 PCB-005	60 (70-130) 67 (70-130)	- -	UJ (all non-detects) UJ (all non-detects)	P
57533-BS1/BS2 (All samples in SDG 1807003-016)	PCB-156 PCB-169 PCB-189 PCB-194 PCB-195 PCB-206 PCB-209	131 (70-130) 153 (70-130) 146 (70-130) 165 (70-130) 133 (70-130) 158 (70-130) 135 (70-130)	- 148 (70-130) 144 (70-130) 161 (70-130) 134 (70-130) 147 (70-130) -	NA	-
57533-BS1/BS2 (B18-10043 B18-20043)	PCB-180	135 (70-130)	131 (70-130)	J (all detects)	P
57533-BS1/BS2 (B18-10040 B18-10044)	PCB-180	135 (70-130)	131 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
57535-CRM1	PCB-105 PCB-118 PCB-156	41 (60-140) 53 (60-140) 41 (60-140)	All samples in SDG 1807003-016	J (all detects) UJ (all non-detects)	A

X. Field Replicates

Samples B18-10043 and B18-20043 were identified as field replicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
PCB-052	0.233	0.2U	Not calculable
PCB-095	0.439	0.276	46
PCB-099	0.444	0.407	9
PCB-101	0.566	0.410	32

Compound	Concentration (ng/g)		RPD
	B18-10043	B18-20043	
PCB-110	0.411	0.286	36
PCB-118	0.408	0.338	19
PCB-138	0.693	0.532	26
PCB-149	0.528	0.421	23
PCB-153	0.781	0.781	0
PCB-158	0.141	0.224	45
PCB-168+132	0.153	0.145	5
PCB-180	0.258	0.314	20
PCB-187	0.172	0.237	32

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD and CRM %R and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-016

Sample	Compound	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	PCB-003 PCB-005	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10043 B18-20043	PCB-180	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10040 B18-10043 B18-10044 B18-20043	PCB-105 PCB-118 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10040 B18-10043 B18-10044 B18-20043	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H3b

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

SDG #: 1807003-016

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer:

2nd Reviewer:

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	N/N	LCS/D. CRM
X.	Field duplicates	N/N	D=3+4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5				
6				
7				
8				

Notes:

LDC #: ~~45184B5~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: SVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5T533-BS1	PCB003	60 (70-130)	( )	( )	All (ND)	J/UJ/A (HL)
		-BS2	005	67 ( )	( )	( )	↓	↓
			156	131 ( )	( )	( )		J/UJ/A (HL)
			169	153 ( )	148 (70-130)	( )		
			180	135 ( )	131 ( )	( )	(det=2, 4)	
			189	146 ( )	144 ( )	( )	(ND)	
			194	165 ( )	161 ( )	( )		
			195	133 ( )	134 ( )	( )		
			206	158 ( )	147 ( )	( )		
			209	135 ( )	( )	( )	↓	
				( )	( )	( )		
		5T535-CRI1	PCB105	41 (60-140)	( )	( )	All (det+ND)	J/UJ/A (LP)
			118	53 ( )	( )	( )		
			156	41 ( )	( )	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

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LDC #: 45128H3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC/MS PCB (EPA SW 846 Method 8270D)

Compound	Concentration (ng/g)		RPD
	2	4	
PCB052	0.233	0.2U	NC
PCB095	0.439	0.276	46
PCB099	0.444	0.407	9
PCB101	0.566	0.410	32
PCB110	0.411	0.286	36
PCB118	0.408	0.338	19
PCB138	0.693	0.532	26
PCB149	0.528	0.421	23
PCB153	0.781	0.781	0
PCB158	0.141	0.224	45
PCB168+132	0.153	0.145	5
PCB180	0.258	0.314	20
PCB187	0.172	0.237	32

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18
B18-10040(SEM)	57537(SEM)	Sediment	08/14/18
B18-10043(SEM)	57538(SEM)	Sediment	08/14/18
B18-10044(SEM)	57539(SEM)	Sediment	08/14/18
B18-20043(SEM)	57540(SEM)	Sediment	08/14/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10040 B18-10043 B18-10044 B18-20043	Mercury	150	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
57534-CRM1	Aluminum Iron	136 (42-124) 158 (33-155)	B18-10040 B18-10043 B18-10044 B18-20043	J (all detects) J (all detects)	A

XI. Field Duplicates

Samples B18-10043 and B18-20043 and samples B18-10043(SEM) and B18-20043(SEM) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/g)		RPD
	B18-10043	B18-20043	
Aluminum	30800	29900	3
Antimony	0.214	0.214	0
Arsenic	6.23	6.27	1
Barium	67.4	60	12
Beryllium	0.538	0.58	8
Cadmium	0.483	0.416	15
Chromium	32.2	31.7	2
Copper	54.3	54.4	0
Iron	26400	26000	2

Analyte	Concentration (ug/g)		RPD
	B18-10043	B18-20043	
Lead	17	16.6	2
Mercury	0.0754	0.0795	5
Nickel	11.1	11.5	4
Phosphorus	400	417	4
Selenium	0.361	0.389	7
Silver	0.298	0.342	14
Zinc	156	150	4

Analyte	Concentration (umol/g)		RPD
	B18-10043(SEM)	B18-20043(SEM)	
Copper	0.0257	0.0603	80
Lead	0.0283	0.0388	31
Nickel	0.00935	0.0155	49
Zinc	0.858	1.06	21

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-016

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Mercury	J (all detects)	P	Technical holding times (H)
B18-10040 B18-10043 B18-10044 B18-20043	Aluminum Iron	J (all detects) J (all detects)	A	Certified reference material (%R) (HP)
B18-10040 B18-10043 B18-10044 B18-20043 B18-10040(SEM) B18-10043(SEM) B18-10044(SEM) B18-20043(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H4a

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

SDG #: 1807003-016

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	N	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCSID
XI.	Field Duplicates	SW	(2,4) (6,8)
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5	B18-10040(SEM)	57537(SEM)	Sediment	08/14/18
6	B18-10043(SEM)	57538(SEM)	Sediment	08/14/18
7	B18-10044(SEM)	57539(SEM)	Sediment	08/14/18
8	B18-20043(SEM)	57540(SEM)	Sediment	08/14/18
9				
10				
11				
12				

Notes:

LDC #: 45128H4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-4		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P]
5-8		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, __ __
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128H4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: CV
2nd reviewer: CV

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

H

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
~~All~~ 1-4	8/14/18	1/11/19	150	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45154H4

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: C
2nd Reviewer: C

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	575341CRM1		Al	136 (42-124)	1-4	J det (A det) HP
			Fe	158 (33-155)		J

Comments:

LDC#: 45128H4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/g)		RPD
	2	4	
Aluminum	30800	29900	3
Antimony	0.214	0.214	0
Arsenic	6.23	6.27	1
Barium	67.4	60	12
Beryllium	0.538	0.58	8
Cadmium	0.483	0.416	15
Chromium	32.2	31.7	2
Copper	54.3	54.4	0
Iron	26400	26000	2
Lead	17	16.6	2
Mercury	0.0754	0.0795	5
Nickel	11.1	11.5	4
Phosphorus	400	417	4
Selenium	0.361	0.389	7
Silver	0.298	0.342	14
Zinc	156	150	4

LDC#: 45128H4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (umol/g)		RPD
	6	8	
Copper	0.0257	0.0603	80
Lead	0.0283	0.0388	31
Nickel	0.00935	0.0155	49
Zinc	0.858	1.06	21

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45128H4a.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-016

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10040	57537	Sediment	08/14/18
B18-10043	57538	Sediment	08/14/18
B18-10044	57539	Sediment	08/14/18
B18-20043	57540	Sediment	08/14/18
B18-10040DUP	57537DUP	Sediment	08/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
All samples in SDG 1807003-016	Acid volatile sulfide	148 days	14 days	J (all detects)	A
All samples in SDG 1807003-016	Ammonia as N	142 days	28 days	J (all detects)	A
All samples in SDG 1807003-016	Total nitrogen	154 days	28 days	J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples B18-10043 and B18-20043 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	B18-10043	B18-20043	
Acid volatile sulfide	324 mg/Kg	221 mg/Kg	38
Ammonia as N	11.7 mg/Kg	23.5 mg/Kg	67
Percent solids	49.6 %	47.7 %	4
Total organic carbon	0.12 %	0.14 %	15
Total organic carbon	1.45 %	1.62 %	11

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-016	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-016

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10040 B18-10043 B18-10044 B18-20043	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10040 B18-10043 B18-10044 B18-20043	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-016

No Sample Data Qualified in this SDG

LDC #: 45128H6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-016 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3 D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	CS
VII.	Duplicate sample analysis	NA	
VIII.	Laboratory control samples	A	LCS/D, CRM
IX.	Field duplicates	SW	(2,4)
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10040	57537	Sediment	08/14/18
2	B18-10043	57538	Sediment	08/14/18
3	B18-10044	57539	Sediment	08/14/18
4	B18-20043	57540	Sediment	08/14/18
5	A1 DUP			
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 45128H6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN [✓ NH$_3$] TKN [✓ TOC] Cr6+ ClO$_4$ [✓ AVS] [✓ % Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
QC's	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$ [✓ PS]
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$
	pH TDS Cl F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Alk CN NH$_3$ TKN TOC Cr6+ ClO$_4$

Comments:

LDC #: 45128H6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd reviewer: [illegible]

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

(H)

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	8/14/18	1/9/19	148	J/R/A (Det)	1/3/19	142	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	8/14/18				1/15/19	154	J/R/A (Det)

LDC#: 45128H6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/Kg)		RPD
	2	4	
Acid volatile sulfides	324	221	38
Ammonia as N	11.7	23.5	67
Percent solids (%)	49.6	47.7	4
Total nitrogen (%)	0.12	0.14	15
TOC (%)	1.45	1.62	11

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45128H6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-018)	Anthracene	67 (70-130)	-	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
57535-CRM1 (SRM 1944)	Benzo(k)fluoranthene	41 (60-140)	All samples in SDG 1807003-018)	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-018

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	Anthracene	J (all detects)	P	Laboratory control samples (%R) (LL)
B18-10200	Benzo(k)fluoranthene	J (all detects)	A	Certified reference material (%R) (LP)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-018

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/24/19

Page: 1 of 1

Reviewer:

2nd Reviewer: DMG

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	SW	LCS/8. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
3				
4				
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128~~#2~~bI-3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5T533-BS1/	VV	67 (70-130)	( )	( )	All (dets)	J/UJ/P (LL)
		-BS1		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		5T535-CRM1	HHH	41 (60-140)	( )	( )	All (dets)	J/UJ/A (LP)
		(SRM 1944)		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-018

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I2c

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-018

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 2

Reviewer:

2nd Reviewer: JV6

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	C7
IX.	Laboratory control samples CRM	A	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
3				
4				
5				
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-018

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I2d

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-018

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: JV6

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-018

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I2e

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-018

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 2

Reviewer: K

2nd Reviewer: JV6

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	cs
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D/8270D-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-018)	alpha-BHC Endosulfan II Endrin aldehyde Hexachlorobenzene	67 (70-130) 15 (70-130) 12 (70-130) 67 (70-130)	- 15 (70-130) 21 (70-130) -	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
57533-BS1/BS2 (All samples in SDG 1807003-018)	Endosulfan I	3 (70-130)	2 (70-130)	R (all non-detects)	P
57533-BS1/BS2 (All samples in SDG 1807003-018)	Methoxychlor Perthane	143 (70-130) -	146 (70-130) 134 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-018)	Endosulfan II Endrin aldehyde	40 (≤30) 55 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
58906-CRM1	gamma-Chlordane	159 (60-140)	All samples in SDG 1807003-018	J (all detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in one sample.

Due to LCS/LCSD %R, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-018

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	alpha-BHC Endosulfan II Endrin aldehyde Hexachlorobenzene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10200	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10200	gamma-Chlordane	J (all detects)	A	Certified reference material (%R) (HP)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I3a

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

SDG #: 1807003-018

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples /CRM	SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
3				
4				
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45138I3

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5T533-BS1/-BS2	A	67 (70-130)	( )	( )	All (ND)	J (all) A
			L	15 ( )	15 (70-130)	( )		
			R	12 ( )	21 ( )	( )		
			FF	67 ( )	( )	( )		
			H	3 ( )	2 ( )	( )		J R/P
			P	43 (↓)	46 ( )	( )		J det F (HL)
		Perthane		( )	134 (↓)	( )		↓
			L	( )	( )	40 (≤30)		J det F (HD)
			R	( )	( )	55 (↓)		↓
				( )	( )	( )		
				( )	( )	( )		
		58906-BSM1	T	159 (60-140)	( )	( )	All (dets)	J det F/A (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
57533-BS1/BS2 (All samples in SDG 1807003-018)	PCB-003 PCB-005	60 (70-130) 67 (70-130)	- -	UJ (all non-detects) UJ (all non-detects)	P
57533-BS1/BS2 (All samples in SDG 1807003-018)	PCB-156 PCB-169 PCB-189 PCB-194 PCB-195 PCB-206 PCB-209	131 (70-130) 153 (70-130) 146 (70-130) 165 (70-130) 133 (70-130) 158 (70-130) 135 (70-130)	- 148 (70-130) 144 (70-130) 161 (70-130) 134 (70-130) 147 (70-130) -	NA	-
57533-BS1/BS2 (All samples in SDG 1807003-018)	PCB-180	135 (70-130)	131 (70-130)	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
57535-CRM1	PCB-105 PCB-118 PCB-156	41 (60-140) 53 (60-140) 41 (60-140)	All samples in SDG 1807003-018	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD and CRM %R and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-018

Sample	Compound	Flag	A or P	Reason (Code)
B18-10200	PCB-003 PCB-005	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10200	PCB-180	J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10200	PCB-105 PCB-118 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10200	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I3b

SDG #: 1807003-018

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/24/19

Page: 1 of 1

Reviewer: 9

2nd Reviewer: JM

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples CRM	SW	LCS/D. CRM
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
3				
4				
5				
6				
7				
8				

Notes:

LDC #: ~~45138 EB52 I36~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: CT
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5T533-EB1/~~EB2~~	PCB003	60 (70-130)	( )	( )	All (ND)	J (all) / UJ/A (all)
			005	67 ( )	( )	( )	↓	↓
			156	131 ( )	( )	( )		J (all) / UJ/A (all)
			169	153 ( )	148 (70-130)	( )		↓
			180	135 ( )	131 ( )	( )	(dets) ~~, ~~ (ND)	
			189	146 ( )	144 ( )	( )		
			194	165 ( )	161 ( )	( )		
			195	133 ( )	134 ( )	( )		
			206	158 ( )	147 ( )	( )		
			↓ 209	135 ( )	( )	( )	↓	↓
				( )	( )	( )		
		5T535-EMI	PCB105	41 (60-140)	( )	( )	All (dets+ND)	J (all) / UJ/A (all)
			118	53 ( )	( )	( )		↓
			↓ 156	41 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18
B18-10200(SEM)	58908(SEM)	Sediment	09/12/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10200	Mercury	121	28	J (all detects)	P

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
58905-CRM1	Aluminum Iron	136 (42-124) 158 (33-155)	B18-10200	J (all detects) J (all detects)	A

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-018

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10200	Mercury	J (all detects)	P	Technical holding times (H)
B18-10200	Aluminum Iron	J (all detects) J (all detects)	A	Certified reference material (%R) (HP)
B18-10200 B18-10200(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128l4a

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 6/3/19

SDG #: 1807003-018

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	N	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCS/D, CRM
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2	B18-10200(SEM)	58908(SEM)	Sediment	09/12/18
3				
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11				
12				

Notes:

LDC #: 05128I4a

VALIDATION FINDINGS WORKSHEET

Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1		[✓ Al, Sb, As, Ba, Be, Cd], Ca, [✓ Cr], Co, [✓ Cu, Fe], [✓ Pb], Mg, Mn, [✓ Hg, Ni], K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, [✓ P] ___
2		Al, Sb, As, Ba, Be, [✓ Cd], Ca, Cr, Co, [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128l4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: G
2nd reviewer: A

(H)

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1	9/12/18	1/11/19	121	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #: 45128I4

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 2 of 1
Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	58905-CRM1		Al	136 (42-124)	1	J det (A (Det) HP
			Fe	158 (33-155)	↓	↓

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-018

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10200	58908	Sediment	09/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10200	Acid volatile sulfide Ammonia as N Total nitrogen	119 days 113 days 125 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-018	Analytes reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-018

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10200	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10200	Analytes reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-018

No Sample Data Qualified in this SDG

LDC #: 45128I6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19

SDG #: 1807003-018 Level II Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3 D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/D, QRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10200	58908	Sediment	09/12/18
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 45128I6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ %Solids] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128I6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer:
2nd reviewer:

CH)

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		Plumb			SM 4500 NH3D		
Parameters:		AVS			Ammonia as N		
Technical holding time:		14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	9/12/18	1/9/19	119	J/R/A (Det)	1/3/19	113	J/R/A (Det)

Method:		SM2540B			EPA 9060		
Parameters:		Percent solids			Total nitrogen		
Technical holding time:		180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
All	9/12/18				1/15/19	125	J/R/A (Det)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56379-BS1 (All samples in SDG 1807003-019)	Benzo(a)anthracene	140 (70-130)	141 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56379-BS1 (All samples in SDG 1807003-019)	Naphthalene	26 (≤25)	NA	-

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-019

Sample	Compound	Flag	A or P	Reason (Code)
B18-SED-EB	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J2b

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 5/30/19

SDG #: 1807003-019

Page: 1 of 1

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer: 4

2nd Reviewer: JVG

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	SB=1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	<5
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2				
3				
4				
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45128J2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		56379-BS1	CCC	140 (70-130)	141 (70-130)	( )	All (ND)	J dets/A (HL)
			S	( )	( )	~~26~~ 26 (≤ 25)		↓ (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers (PBDE) by Environmental Protection Agency (EPA) Method 625-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-019

Sample	Compound	Flag	A or P	Reason (Code)
B18-SED-EB	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J2c

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-019

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer: 9

2nd Reviewer: JW

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA Method 625-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2				
3				
4				
5				
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Fipronil & Degradates

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) Method 625-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-019

Sample	Compound	Flag	A or P	Reason (Code)
B18-SED-EB	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J2d

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-019

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JK

METHOD: GC/MS Fipronil & Degradates (EPA Method 625-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2				
3				
4				
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Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) Method 625-MRM

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
56379-BS1/BS2 (All samples in SDG 1807003-019)	Resmethrin	0 (0-94)	0 (0-94)	UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
56379-BS1/BS2 (All samples in SDG 1807003-019)	Deltamethrin/Tralomethrin Esfenvalerate Fenvalerate Fluvalinate	44 (≤30) 49 (≤30) 44 (≤30) 51 (≤30)	NA	-

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to LCS/LCSD %R and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-019

Sample	Compound	Flag	A or P	Reason (Code)
B18-SED-EB	Resmethrin	UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-SED-EB	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J2e

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-019

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer:

2nd Reviewer: SVG

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA Method 625-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2				
3				
4				
5				
6				
7				
8				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				
M. Resmethrin				
N. Fenvalerate				

LDC #: ~~15128~~J2a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: DG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		563T9-BS1/	M	0 (0-94)	0 (0-94)	( )	All (ND)	J/UJ/P([illegible])
		-BS2	G	( )	( )	44 (≤30)		J dets/P(HD)
			H	( )	( )	49 ( )		
			~~I~~ N	( )	( )	44 ( )		
			I	( )	( )	51 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) Method 625/625-NCI

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-019

Sample	Compound	Flag	A or P	Reason (Code)
B18-SED-EB	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J3a **VALIDATION COMPLETENESS WORKSHEET** Date: 5/30/19
SDG #: 1807003-019 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer: JR

METHOD: GC/MS Chlorinated Pesticides (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2				
3				
4				
5				
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: May 31, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) Method 625

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance check data were not reviewed for Level II validation.

III. Initial Calibration and Initial Calibration Verification

Initial calibration data were not reviewed for Level II validation.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

Internal standard data were not reviewed for Level II validation.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Compound reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIII. Target Compound Identification

Raw data were not reviewed for Level II validation.

XIV. System Performance

Raw data were not reviewed for Level II validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-019

Sample	Compound	Flag	A or P	Reason (Code)
B18-SED-EB	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-019

Level II

Laboratory: Physis Environmental Laboratories, Inc.

Date: 5/30/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS PCB as Congeners (EPA Method 625)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	N/N	
IV.	Continuing calibration	N	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2				
3				
4				
5				
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Metals

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18
B18-SED-EBMS	56384MS	Water	07/10/18
B18-SED-EBMSD	56384MSD	Water	07/10/18
B18-SED-EBDUP	56384DUP	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

ICP-MS tune data were not reviewed for Level II validation.

III. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

IV. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
B18-SED-EB	Copper Iron Nickel Zinc	0.386 ug/L 3.61 ug/L 12.5 ug/L 2.47 ug/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standard data were not reviewed for Level II validation.

XIII. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Analyte reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-019

Sample	Analyte	Flag	A or P	Reason (Code)
B18-SED-EB	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J4a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-019 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Metals (EPA Method 200.8/245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	ICP/MS Tune	N	
III.	Instrument Calibration	N	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	SW	EB=1
VII.	Matrix Spike/Matrix Spike Duplicates	A	
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2	MS			
3	MSD			
4	DUP			
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 45128J6a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1		[✓ Al, Sb, As, Ba, Be, Cd] Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb] Mg, Mn, [✓ Hg, Ni] K, [✓ Se, Ag] Na, Tl, V, [✓ Zn] Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
QC:2-4		[✓ Al, Sb, As, Ba, Be, Cd] Ca, [✓ Cr], Co, [✓ Cu, Fe, Pb] Mg, Mn, [✓ Hg, Ni] K, [✓ Se, Ag], Na, Tl, V, [✓ Zn], Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45128S4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: a
2nd reviewer: Q

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Sample: 1 Field Blank / Trip Blank / Rinsate / Other_____(circle one)

Analyte	Concentration Units (ug/L)
Cu	0.386
Fe	3.61
Ni	12.5
Zn	2.47

Sample: _____ Field Blank / Trip Blank / Rinsate / Other_____ (circle one)

Analyte	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 4, 2019

Parameters: Wet Chemistry

Validation Level: Level II

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-019

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-SED-EB	56384	Water	07/10/18
B18-SED-EBMS	56384MS	Water	07/10/18
B18-SED-EBMSD	56384MSD	Water	07/10/18
B18-SED-EBDUP	56384DUP	Water	07/10/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Ammonia as Nitrogen by Standard Method 4500-NH3-D
Nitrate as Nitrogen and Nitrite as Nitrogen by Environmental Protection Agency (EPA) Method 300.0
Total Organic Carbon by Standard Method 5310B
Total Phosphorus by Standard Method 4500-P E
Total Suspended Solids by Standard Method 2540D

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration data were not reviewed for Level II validation.

III. Continuing Calibration

Continuing calibration data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample B18-SED-EB was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
B18-SED-EB	Total suspended solids	0.95 mg/L

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-SED-EBMS/MSD (All samples in SDG 1807003-019)	Nitrate as N	-	74 (76-121)	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-019	Analytes reported below the RL and above the MDL	J (all detects)	A

Raw data were not reviewed for Level II validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS/MSD %R and results reported below the RL and above the MDL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-019

Sample	Analyte	Flag	A or P	Reason (Code)
B18-SED-EB	Nitrate as N	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-SED-EB	Analytes reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-019

No Sample Data Qualified in this SDG

LDC #: 45128J6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/3/19
SDG #: 1807003-019 Level II Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Ammonia as N (SM4500-NH3 D), Nitrate as N, Nitrite as N (EPA Method 300.0), TOC (SM 5310B), Total Phosphorus (SM 4500-P E), TSS (SM 2540D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	SW	EB=1
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-SED-EB	56384	Water	07/10/18
2	MS			
3	MSD			
4	DUP			
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 45128J6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F [✓ NO_3] [✓ NO_2] SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ P] [✓ TSS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC:2-4	pH TDS Cl F [✓ NO_3] [✓ NO_2] SO_4 O-PO_4 Alk CN NH_3 TKN [✓ TOC] Cr6+ ClO_4 [✓ P]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45128J6
SDG #: —

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other_____(circle one)

Analyte	Concentration Units ( )
TSS	0.95 mg/L

Sample: _____ Field Blank / Trip Blank / Rinsate / Other_____ (circle one)

Analyte	Concentration Units ( )

LDC #: 45128S6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method see calc

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	2/3		NO3N	~~74(76-121)~~	74(76-121)		All	J/UJ/A (M) LM

Comments: _____

LDC #: 45128

EDD POPULATION COMPLETENESS WORKSHEET

Date: 6/5
Page: 1 of 1
2nd Reviewer:

The LDC job number listed above was entered by JE.
Entered from Body or Summary

	EDD Process		Comments/Action
I.	EDD Completeness	-	
Ia.	- All methods present?	Y	
Ib.	- All samples present/match report?	Y	
Ic.	- All reported analytes present?	Y	
Id.	- 10% or 100% verification of EDD?	Y	
II.	EDD Preparation/Entry	-	
IIa.	- Carryover U/J?	N	
IIb.	- Reason Codes used? If so, note which codes.	Y	client
IIc.	- Additional Information (QC Level, Validator, Validated Y/N, etc.)		
III.	Reasonableness Checks	-	
IIIa.	- Do all qualified ND results have ND qualifier (e.g. UJ)?	Y	
IIIb.	- Do all qualified detect results have detect qualifier (e.g. J)?	Y	
IIIc.	- If reason codes are used, do all qualified results have reason code field populated, and vice versa?	Y	
IIId.	-Does the detect flag require changing for blank qualifier? If so, are all U results marked ND?	+	
IIIe.	- Do blank concentrations in report match EDD where data was qualified due to blank contamination?	—	
IIIf.	- Were multiple results reported due to dilutions/reanalysis? If so, were results qualified appropriately?	+	
IIIg.	-Are there any discrepancies between the data packet and the EDD?	N	

Notes: *see discrepancy sheet

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Wood Environment & Infrastructure
9210 Sky Park Ct
San Diego, CA 92123
Attn: Ms. Corey Sheredy
corey.sheredy@woodplc.com

June 5, 2019

SUBJECT: 2018 Regional Harbor Monitoring Program, Data Validation

Dear Ms. Sheredy

Enclosed are the final validation reports for the fractions listed below. This SDG was received on May 30, 2019. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #45174:

SDG #	**Fraction**
1807003-008	Metals, Wet Chemistry

The data validation was performed under Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California; June 2018
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review; January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

pgeng@lab-data.com
Project Manager/Senior Chemist

3,314 pages-ADV

Attachment 1

Level IV / Client Select

LDC #45174 (Wood Environment & Infrastructure Solutions-San Diego, CA / 2018 Regional Harbor Monitoring Program)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270D)		PBDE (8270D/ -NCI)		Pyre. Pest. (8270D -NCI)		Pyre. Pest. (8270D -MRM)		Pest. (8270D)		PCB Cong. (8270D)		Metals (6020)		Hg (245.7)		SEM Metals (200.8)		AVS (1981)		NH_3-N (4500D)		Part. Size (2560D)		% Solids (2540B)		Total N. (9060)		TOC (9060)					
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	1807003-008	05/30/19	06/20/19	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8				
Total	J/PG			0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	0	0	120

Shaded cells indicate Level IV validation (all other cells are Level II review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

LDC Report# 45174A4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 5, 2019

Parameters: Metals

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10022(SEM)	56582(SEM)	Sediment	07/18/18
B18-10076(SEM)	56583(SEM)	Sediment	07/18/18
B18-10077(SEM)	56584(SEM)	Sediment	07/18/18
B18-10113(SEM)	56586(SEM)	Sediment	07/18/18
B18-10024(SEM)	56587(SEM)	Sediment	07/19/18
B18-10114(SEM)	56589(SEM)	Sediment	07/19/18
B18-10115(SEM)	56590(SEM)	Sediment	07/19/18
B18-10116(SEM)	56591(SEM)	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18
B18-10076MS(SEM)	56583MS(SEM)	Sediment	07/18/18
B18-10076MSD(SEM)	56583MSD(SEM)	Sediment	07/18/18
B18-10076DUP(SEM)	56583DUP(SEM)	Sediment	07/18/18

Samples appended with "SEM" were analyzed for Simultaneously Extracted Metals

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Phosphorus, Selenium, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020 and EPA Method 200.8
Mercury by EPA Method 245.7

All sample results were subjected to Level IV evaluation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
B18-10022 B18-10076 B18-10077 B18-10113	Mercury	177	28	J (all detects)	P
B18-10024 B18-10114 B18-10115 B18-10116	Mercury	176	28	J (all detects)	P

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was not performed for this SDG.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods with the following exceptions:

Sample	Analyte	Finding
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Mercury	No closing CCB was analyzed.

No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116)	Mercury	-	138 (75-125)	J (all detects)	A

For B18-10076MS/MSD, no data were qualified for aluminum and iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116)	Aluminum Iron	29 (≤25) 67 (≤25)	J (all detects) J (all detects)	A

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits with the following exceptions:

CRM ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
56579-CRM1	Aluminum	151 (42-124)	B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	J (all detects)	A

XI. Field Duplicates

Samples B18-10116 and B18-20116 and samples B18-10116(SEM) and B18-20116(SEM) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/g)		RPD
	B18-10116	B18-20116	
Aluminum	4330	5990	32
Antimony	0.132	0.16	19
Arsenic	4.16	5	18
Barium	9.67	16.7	53
Beryllium	0.0925	0.137	39

Analyte	Concentration (ug/g)		RPD
	B18-10116	B18-20116	
Cadmium	0.0295	0.0352	18
Chromium	8.67	9.66	11
Copper	10.2	14.6	35
Iron	8500	8790	3
Lead	6.82	8.4	21
Mercury	0.0236	0.0425	57
Nickel	1.94	2.58	28
Phosphorus	176	234	28
Selenium	0.097	0.108	11
Silver	0.0938	0.0808	15
Zinc	33.9	45.8	30

Analyte	Concentration (umol/g)		RPD
	B18-10116(SEM)	B18-20116(SEM)	
Copper	0.0894	0.0989	10
Lead	0.0148	0.0219	39
Nickel	0.00363	0.00526	37
Zinc	0.238	0.371	44

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Sample Result Verification

All sample result verifications were acceptable.

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Analyte reported below the RL and above the MDL	J (all detects)	A

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, MS/MSD %R and RPD, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in sixteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Metals - Data Qualification Summary - SDG 1807003-008

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Mercury	J (all detects)	P	Technical holding times (H)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Mercury	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Aluminum Iron	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Aluminum	J (all detects)	A	Certified reference material (%R) (HP)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116 B18-10022(SEM) B18-10076(SEM) B18-10077(SEM) B18-10113(SEM) B18-10024(SEM) B18-10114(SEM) B18-10115(SEM) B18-10116(SEM)	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Metals - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Metals - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A4a

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 6/6/19

SDG #: 1807003-008

Page: 1 of 2

Laboratory: Physis Environmental Laboratories, Inc.

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, SW	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	not preformed: Text
V.	Laboratory Blanks	SW	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	N	
X.	Laboratory control samples	SW	LCS/D, CRM
XI.	Field Duplicates	SW	(8, B18-20116), (16, B18-20116SEM)
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	A	
XIV.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

Samples appended with "SEM" were analyzed as Simultaneously Extracted Metals

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10022(SEM)	56582(SEM)	Sediment	07/18/18
10	B18-10076(SEM)	56583(SEM)	Sediment	07/18/18
11	B18-10077(SEM)	56584(SEM)	Sediment	07/18/18
12	B18-10113(SEM)	56586(SEM)	Sediment	07/18/18
13	B18-10024(SEM)	56587(SEM)	Sediment	07/19/18
14	B18-10114(SEM)	56589(SEM)	Sediment	07/19/18
15	B18-10115(SEM)	56590(SEM)	Sediment	07/19/18

LDC #: 45174A4a

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Date: 6/16

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020/EPA Method 200.8/EPA Method 245.7)

16	B18-10116(SEM)	56591(SEM)	Sediment	07/19/18
17	B18-10076MS	56583MS	Sediment	07/18/18
18	B18-10076MSD	56583MSD	Sediment	07/18/18
19	B18-10076DUP	56583DUP	Sediment	07/18/18
20	B18-10076MS(SEM)	56583MS(SEM)	Sediment	07/18/18
21	B18-10076MSD(SEM)	56583MSD(SEM)	Sediment	07/18/18
22	B18-10076DUP(SEM)	56583DUP(SEM)	Sediment	07/18/18
23				
24				
25				

Notes:

LDC #: 45174A6

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: CB
2nd Reviewer: CP

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓	✓		
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low standard checks within 70-130%			✓	
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?		✓		
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.		✓		
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓	✓		
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?		✓		

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?			✓	
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 45174A4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-8		[✓ Al, Sb, As, Ba, Be, Cd,] Ca, [✓ Cr,] Co, [✓ Cu, Fe, Pb,] Mg, Mn, [✓ Hg, Ni,] K, [✓ Se, Ag,] Na, Tl, V, [✓ Zn,] Mo, B, Sn, Ti, [✓ P]
9-16		Al, Sb, As, Ba, Be, [✓ Cd,] Ca, Cr, Co, [✓ Cu,] Fe, [✓ Pb,] Mg, Mn, Hg, [✓ Ni,] K, Se, [✓ Ag,] Na, Tl, V, [✓ Zn,] Mo, B, Sn, Ti, ____
QC: ~~9-16~~		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
17-19		[✓ Al, Sb, As, Ba, Be, Cd,] Ca, [✓ Cr,] Co, [✓ Cu, Fe, Pb,] Mg, Mn, [✓ Hg, Ni,] K, [✓ Se, Ag,] Na, Tl, V, [✓ Zn,] Mo, B, Sn, Ti, [✓ P]
20-22		Al, Sb, As, Ba, Be, [✓ Cd,] Ca, Cr, Co, [✓ Cu,] Fe, [✓ Pb,] Mg, Mn, Hg, [✓ Ni,] K, Se, [✓ Ag,] Na, Tl, V, [✓ Zn,] Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 45174A4a

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd reviewer:

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.

METHOD:		Mercury Holding time = 28 days					
Sample ID:	Sampling Date	Analysis Date	Total Time until Analysis (days)	Qualifier Code: 1	Det/ND		
1-4	7/18/18	1/11/19	177	J/R/P	Det		
5-8	7/19/18	1/11/19	176	J/R/P	Det		

Technical Holding Time Criteria

Mercury: 28 days
All other metals: 180 days - 1 year if frozen

LDC #:__________
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: CR
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

#	Date	Blank ID	Analyte	Finding	Associated Samples	Qualifications
		Closing CCB	Hg	No closing CCB	~~All~~ 1-8	Text

Comments:______________________________

LDC #: 45174 A4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: C
2nd Reviewer: CL

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% (25) for samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	17/18		Al			29 (≤25)	1-8	J/UJ/A (Del) (HD)
			Fe			67 ↓		↓ ↓
			Itg		138			J del A ↓ (Hm)

Comments: 17/18: Al, Fe 74X ~~B18-20116MS/D: Al, Fe 74X~~ a

LDC #: 45174A4

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
	56579-CR	M1	A1	151 (42-124)	1-8	J det/A (det) (HP)
	60150-CR	AA1	A1	127	8	

Comments:

LDC#: 45174A4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [signature]
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (ug/g)		RPD
	8	B18-20116	
Aluminum	4330	5990	32
Antimony	0.132	0.16	19
Arsenic	4.16	5	18
Barium	9.67	16.7	53
Beryllium	0.0925	0.137	39
Cadmium	0.0295	0.0352	18
Chromium	8.67	9.66	11
Copper	10.2	14.6	35
Iron	8500	8790	3
Lead	6.82	8.4	21
Mercury	0.0236	0.0425	57
Nickel	1.94	2.58	28
Phosphorus	176	234	28
Selenium	0.097	0.108	11
Silver	0.0938	0.0808	15
Zinc	33.9	45.8	30

LDC#: 45174A4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (umol/g)		RPD
	16	B18-20116(SEM)	
Copper	0.0894	0.0989	10
Lead	0.0148	0.0219	39
Nickel	0.00363	0.00526	37
Zinc	0.238	0.371	44

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45174A4a.wpd

LDC #: 45174A4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: a
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV	ICP/MS (Initial calibration)	Sb	102.172	100	102	102	Y
ICV	CVAA (Initial calibration)	Hg	1030	1000	103	—	Y
	ICP (Continuing calibration)						
CCV	ICP/MS (Continuing calibration)	P	4.625	5	93	93	Y
CCV	CVAA (Continuing calibration)	Hg	1050	1000	105	—	Y

Comments:

LDC #: 45174A4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: CR
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = |I-SDR| / I x 100 Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
N	ICP interference check						
LCS	Laboratory control sample	Ba	1.99	2	100	100	Y
17	Matrix spike	Cu	(SSR-SR) 59.5	58.2	102	102	Y
19	Duplicate	Sb	0.239	0.254	6	6	Y
	ICP serial dilution						

Comments: _____

LDC #: 45174A4c

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CL
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for ~~Sb~~ 10 (Pb) were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

$$\frac{32.051\ ug/g}{\cancel{206}\ 207.2} = 0.15417\ umol/g$$

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	1	P (ug/g)	292	292	Y
	2	Sb	0.239	0.239	
	3	Cr	29.5	29.5	
	4	Fe	29500	29500	
	5	Hg	0.289	0.289	
	6	Ni	15.6	15.6	
	7	Se	0.403	0.403	
	~~8~~	Ag ✓	0.0938	0.093	
	~~9~~	Cu (umol/g)	0.162	~~0.159~~ 0.163	
	10	Pb	0.155	0.1545	
	11	Ni	0.00681	0.00681	
	12	Zn	1.66	1.66	
	13	Cu	0.508	0.508	
	14	Pb	0.17	0.17	
	15	Ni	0.0180	0.0182	
	16	Zn ✓	0.238	0.238	✓

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 5, 2019

Parameters: Wet Chemistry

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10022DUP	56582DUP	Sediment	07/18/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18
B18-10114MS	56589MS	Sediment	07/19/18
B18-10114MSD	56589MSD	Sediment	07/19/18
B18-10114DUP	56589DUP	Sediment	07/19/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Acid Volatile Sulfide by Plumb 1981
Ammonia as Nitrogen by Standard Method 4500-NH3-D
Particle Size by Standard Method 2560D
Percent Solids by Standard Method 2540B
Total Nitrogen and Total Organic Carbon by Environmental Protection Agency (EPA) SW 846 Method 9060

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
B18-10022 B18-10076 B18-10077 B18-10113	Acid volatile sulfide Ammonia as N Total nitrogen	170 days 169 days 177 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A
B18-10114 B18-10115 B18-10116	Acid volatile sulfide Ammonia as N Total nitrogen	169 days 168 days 176 days	14 days 28 days 28 days	J (all detects) J (all detects) J (all detects)	A

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10114MS/MSD (All samples in SDG 1807003-008)	Acid volatile sulfide	-14 (80-120)	-5 (80-120)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
B18-10022DUP (All samples in SDG 1807003-008)	Grain size-Phi 2.0	26 (≤20)	-	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	B18-10116	B18-20116	
Acid volatile sulfide	0.965 mg/Kg	1.69 mg/Kg	55
Ammonia as N	3.65 mg/Kg	6.28 mg/Kg	53
Percent solids	79.1 %	75.7 %	4
Total organic carbon	0.12 %	0.14 %	15
Gravel	4.5 %	1.3 %	110

X. Sample Result Verification

All analytes reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

2018 Regional Harbor Monitoring Program
Wet Chemistry - Data Qualification Summary - SDG 1807003-008

Sample	Analyte	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10114 B18-10115 B18-10116	Acid volatile sulfide Ammonia as N Total nitrogen	J (all detects) J (all detects) J (all detects)	A	Technical holding times (H)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Acid volatile sulfide	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Grain size-Phi 2.0	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Analyte reported below the RL and above the MDL	J (all detects)	A	Sample result verification (DL)

2018 Regional Harbor Monitoring Program
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Wet Chemistry - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/6/19
SDG #: 1807003-008 Level IV Page: 1 of 1
Laboratory: Physis Environmental Laboratories, Inc. Reviewer:
2nd Reviewer:

METHOD: (Analyte) AVS (Plumb 1981), Ammonia as N (SM4500-NH3 D), Particle Size (SM 2560D), % Solids (SM2540B), Total Nitrogen (EPA SW846 9060), TOC (EPA SW 846 Method 9060)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	A	LCS/D, CRM (8, B18-20116)
IX.	Field duplicates	SW	
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10022DUP	56582DUP	Sediment	07/18/18
10	B18-10076MS	56583MS	Sediment	07/18/18
11	B18-10076MSD	56583MSD	Sediment	07/18/18
12	B18-10076DUP	56583DUP	Sediment	07/18/18
13	B18-10114MS	56589MS	Sediment	07/19/18
14	B18-10114MSD	56589MSD	Sediment	07/19/18
15	B18-10114DUP	56589DUP	Sediment	07/19/18
16				
17				

LDC #: 45174A6

VALIDATION FINDINGS CHECKLIST

Reviewer: OR
2nd Reviewer: [signature]

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓	✓		
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)	✓		✓	
Were balance checks performed as required? (Level IV only)	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.		✓		
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓	✓	
Were the performance evaluation (PE) samples within the acceptance limits?				

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-8	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ AVS] [✓ %Solid] [✓ N] [✓ PS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC-9	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ PS]
10,11	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN TOC Cr6+ ClO_4
12	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN [✓ NH_3] TKN [✓ TOC] Cr6+ ClO_4 [✓ N]
13,14	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ AVS]
15	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4 [✓ AVS]
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer:
2nd reviewer:

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

(H)

Method:	Plumb			SM 4500 NH3D		
Parameters:	AVS			Ammonia as N		
Technical holding time:	14 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-4	7/18/18	1/4/19	170	J/R/A (Det)	1/3/19	169	J/R/A (Det)
6-18	7/19/18	1/4/19	169	J/R/A (Det)	1/3/19	168	J/R/A (Det)

Method:	SM2540B			EPA 9060		
Parameters:	Percent solids			Total nitrogen		
Technical holding time:	180 days			28 days		
Sample ID	Sampling date	Analysis date	Total Time (days)	Qualifier	Analysis date	Total Time (days)	Qualifier
1-4	7/18/18				1/11/19	177	J/R/A (Det)
6-8	7/19/18				1/11/19	176	J/R/A (10, 11=ND)

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: S
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125?~~ QAPP If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ~~≤ 20%~~ for water samples and ~~≤ 35%~~ for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	13/14		AVS	-14 (80-120)	-5		All	J/R1A (~~DLC~~) (LM)

Comments: _____

LDC #: 45124A6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. (HD)

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		9		Grain Size: Phi 2.0	26 (≤20)		All	J (all detects) / UJ (all non-detects) / A

Comments: _____

LDC#: 45174A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/Kg)		RPD
	8	B18-20116	
Acid volatile sulfides	0.965	1.69	55
Ammonia as N	3.65	6.28	53
Percent solids (%)	79.1	75.7	4
TOC (%)	0.12	0.14	15
Gravel (%)	4.5	1.3	110

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2019\45174A6.wpd

LDC #: USI7496

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

Method: Inorganics, Method see calc

The correlation coefficient (r) for the calibration of TOC was recalculated. Calibration date: 2/28/18

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	TOC	s1	0.0104	27.5635	*0.999828*	*0.999832*	Y
		s2	0.0207	60.4996			
		s3	0.0311	61.3182			
		s4	0.0518	140.4841			
		s5	0.1865	477.1572			
		s6	0.3004	759.9895			
		s7	0.4144	1038.0624			
		s8	0.5387	1355.2474			
		s9	0.6527	1612.4846			
Calibration verification	↓	ICV	10	10.32	103	103	
Calibration verification	NH_3N	CCV	0.1	0.101	101	101	
Calibration verification	TNS	CCV	20	18.489	92	92	↓

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: a
2nd Reviewer: a

METHOD: Inorganics, Method see cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	AVS	19.1	20.1	95	95	Y
10	Matrix spike sample	NH3N	(SSR-SR) 6.7	8.01	84	84	
12	Duplicate sample	↓	12	11.9	1	1	↓

Comments: _____

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CL
2nd reviewer: [signature]

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for TOC reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{WE}{total} \times 100$

Recalculation: $\frac{0.09\ mg}{10.9\ mg} \times 100 = 0.83\%$

#	Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
	1	AVS	7.82	7.82	Y
	2	NH_3-N	12	12	↓
	3	% Solids (%)	72.1	72.1	↓
	4	Total N (%)	0.1	0.1	↓
	5	TOC (%)	0.83	0.83	↓
	6	NH_3 N ~~Total P (mg/kg)~~	~~56~~ 14.3	14.3	↓
	7	AVS	11.8	11.8	↓
	8	Gravel (%)	4.5	4.5	✓

Note:

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Wood Environment & Infrastructure
9210 Sky Park Ct
San Diego, CA 92123
Attn: Ms. Corey Sheredy
corey.sheredy@woodplc.com

June 13, 2019

SUBJECT: 2018 Regional Harbor Monitoring Program, Data Validation

Dear Ms. Sheredy

Enclosed are the final validation reports for the fractions listed below. This SDG was received on May 30, 2019. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #45174:

SDG #	Fraction
1807003-008	Polynuclear Aromatic Hydrocarbons, Polybrominated Diphenyl Ethers, Synthetic Pyrethroid Pesticides, Chlorinated Pesticides,

The data validation was performed under Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California; June 2018
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review; January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

3,314 pages-ADV

Attachment 1

Level IV / Client Select

LDC #45174 (Wood Environment & Infrastructure Solutions-San Diego, CA / 2018 Regional Harbor Monitoring Program)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270D)		PBDE (8270D/ -NCI)		Pyre. Pest. (8270D -NCI)		Pyre. Pest. (8270D -MRM)		Pest. (8270D)		PCB Cong. (8270D)		Metals (6020)		Hg (245.7)		SEM Metals (200.8)		AVS (1981)		NH_3-N (4500D)		Part. Size (2560D)		% Solids (2540B)		Total N. (9060)		TOC (9060)					
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	1807003-008	05/30/19	06/20/19	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8				
Total	J/PG			0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	8	0	0	0	120

Shaded cells indicate Level IV validation (all other cells are Level II review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 11, 2019

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Compound	r^2	Associated Samples	Flag	A or P
01/29/19	Benzo(b)fluoranthene Benzo(k)fluoranthene Fluoranthene Pyrene	0.986 0.988 0.988 0.989	All samples in SDG 1807033-008	J (all detects) J (all detects) J (all detects) J (all detects)	A

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/29/19	Biphenyl	60	All samples in SDG 1807003-008	J (all detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/30/19	Chrysene Indeno(1,2,3-cd)pyrene	35 26	B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Benzo(b)fluoranthene Fluoranthene	194 (50-150) 162 (50-150)	183 (50-150) -	J (all detects) J (all detects)	A
B18-10076MS/MSD (B18-10076)	Naphthalene	43 (50-150)	-	J (all detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Naphthalene	28 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	1-Methylnaphthalene 2-Methylnaphthalene	32 (≤25) 26 (≤25)	J (all detects) J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
209040BS1/BS2 (All samples in SDG 1807003-008)	1-Methylnaphthalene 2-Methylnaphthalene Biphenyl Naphthalene 2,6-Dimethylnaphthalene Acenaphthene	59 (70-130) 61 (70-130) 64 (70-130) 48 (70-130) - -	54 (70-130) 55 (70-130) 60 (70-130) 42 (70-130) 65 (70-130) 67 (70-130)	J (all detects) UJ (all non-detects)	P
209040BS1/BS2 (All samples in SDG 1807003-008)	Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Fluoranthene	171 (70-130) 131 (70-130) 139 (70-130) - -	171 (70-130) 135 (70-130) 144 (70-130) 134 (70-130) 131 (70-130)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10116	B18-20116	
1,6,7-Trimethylnaphthalene	1.27	1.38	8
1-Methylnaphthalene	0.814	0.836	3
1-Methylphenanthrene	1.51	1.32	13
2,6-Dimethylnaphthalene	0.577	0.624	8
2-Methylnaphthalene	1.64	1.70	4
Acenaphthene	0.50U	0.157	Not calculable
Acenaphthylene	0.233	0.331	35
Anthracene	0.762	0.767	1
Benzo(a)anthracene	21.8	6.02	113
Benzo(a)pyrene	8.1	3.69	75
Benzo(b)fluoranthene	11.8	5.47	73
Benzo(e)pyrene	7.06	3.58	65
Benzo(g,h,i)perylene	4.66	3.77	21
Benzo(k)fluoranthene	8.53	4.3	66
Biphenyl	0.291	0.275	6
Chrysene	7.27	2.52	97
Dibenzo(a,h)anthracene	4.79	3.2	40
Dibenzothiophene	0.324	0.357	10
Fluoranthene	10.4	4.96	71
Fluorene	0.643	0.605	6
Indeno(1,2,3-cd)pyrene	19.4	14.2	31
Naphthalene	2.17	1.91	13

Compound	Concentration (ng/g)		RPD
	B18-10116	B18-20116	
Perylene	1.64	0.766	73
Phenanthrene	4.51	4.29	5
Pyrene	9.84	5.13	63

XI. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Affected Compound	Flag	A or P
B18-10077	d12-Benzo(a)pyrene d12-Benzo(g,h,i)perylene	66435150 (15953287-63813148) 31353208 (7832575-31330300)	Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Benzo(e)pyrene Perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P
B18-10024	d12-Benzo(a)pyrene d12-Benzo(g,h,i)perylene	69551936 (15953287-63813148) 33396202 (7832575-31330300)	Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Benzo(e)pyrene Perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P
B18-10116	d12-Benzo(a)pyrene d12-Benzo(g,h,i)perylene	67114126 (15953287-63813148) 34112307 (7832575-31330300)	Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Benzo(e)pyrene Perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

XII. Compound Quantitation

All compound quantitations were within validation criteria.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications were within validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, ICV %D, continuing calibration %D, MS/MSD %R and RPD, DUP RPD, LCS/LCSD %R, internal standards area, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Benzo(b)fluoranthene Benzo(k)fluoranthene Fluoranthene Pyrene	J (all detects) J (all detects) J (all detects) J (all detects)	A	Initial calibration (r^2) (BC)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Biphenyl	J (all detects)	A	Initial calibration verification (%D) (LV)
B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Chrysene	J (all detects)	A	Continuing calibration (%D) (LC)
B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Indeno(1,2,3-cd)pyrene	J (all detects)	A	Continuing calibration (%D) (CH)
B18-10076	Benzo(b)fluoranthene Fluoranthene	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (HM)
B18-10076	Naphthalene	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)(RPD) (LM) (HD)
B18-10076	1-Methylnaphthalene 2-Methylnaphthalene	J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	1-Methylnaphthalene 2-Methylnaphthalene Biphenyl Naphthalene 2,6-Dimethylnaphthalene Acenaphthene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (HL)
B18-10077 B18-10024 B18-10116	Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Benzo(e)pyrene Perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Internal standards (area) (*XI)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A2b

SDG #: 1807003-008

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 6/10/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JVG

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/SW	r^2; RSD ≤ 20%. ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates /DUP	SW/SW	
IX.	Laboratory control samples /LCSD	SW/SW	LCS/D. LCSD
X.	Field duplicates	SW	D = B + B18-20016
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10076MS	56583MS	Sediment	07/18/18
10	B18-10076MSD	56583MSD	Sediment	07/18/18
11	B18-10076DUP	56583DUP	Sediment	07/18/18
12				
13				

LDC #: 45174A26

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: CO
2nd Reviewer: SM

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
~~Were all samples analyzed within the 12 hour clock criteria?~~	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?		✓		
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	

LDC #: 45174A26

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: MC

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?		✓		
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 1,6,7-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 45174Ab

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: 9
2nd Reviewer: SV6

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? ≤ 0.990

Y N N/A Did the initial calibration meet the acceptance criteria?

Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤20 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: <20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	1/29/19	ICAL	~~EEE~~	$r^2 = 0.986$		All (dots)	√ (H) √ (BC)
			HHH	$= 0.988$			
			YY	$= 0.987$			
			ZZ	$= 0.989$			

LDC #: ~~45174A2b~~

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JV6

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ~~≤20~~ 30 %D ?

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤20.0%~~ 30%)	Associated Samples	Qualifications
	1/29/19	ICV	~~zzz~~	60	All (data)	J/UJ/A (all)

LDC #: 43174A-b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: 9
2nd Reviewer: JB

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	1/30/19	ccV	DDD	35		3-8. (dets)	√ (LC)
			VVV	26			√ (ACH)
							~~(LCS)~~

Privileged and Confidential

LDC #: 45173A

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	9/10	GGG	194 (50-150)	183 (50-150)	( )	2 (dets)	J dets/A (HM)
		YY	162 (↓)	( )	( )		↓
		S	43 (↓)	( )	( )		J/UJ/A (<LM)
		S	( )	( )	28 (≤25)		J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	11	TTT	( )	( )	32 (≤25)	2 (dets)	J dets/A (HD)
		W	( )	( )	26 (↓)		↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 45174A-b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: SM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20904-BS1/-BS2	TTT	59 (70-130)	54 (70-130)	( )	All (dot3+ND)	J/UJ/P (LL)
			WW	61 ( )	55 ( )	( )		
			EEE	64 ( )	60 ( )	( )		
			SS	48 ( )	42 ( )	( )		
			XXX	( )	65 ( )	( )		
			GG	( )	67 ( )	( )		
			CCC	171 ( )	171 ( )	( )	(dot3)	J dot3/P (HL)
			FFF	131 ( )	135 ( )	( )		
			VV	139 ( )	144 ( )	( )		
			KK	( )	134 ( )	( )		
			YY	( )	131 ( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

LDC#: 45174A2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: MC

METHOD: GCMS PAH 8270D

Compound	Concentration (ng/g)		RPD
	8	B18-20116	
YYY	1.27	1.38	8
TTT	0.814	0.836	3
HHHH	1.51	1.32	13
XXX	0.577	0.624	8
W	1.64	1.70	4
GG	0.50U	0.157	NC
DD	0.233	0.331	35
VV	0.762	0.767	1
CCC	21.8	6.02	113
III	8.1	3.69	75
GGG	11.8	5.47	73
WWW	7.06	3.58	65
LLL	4.66	3.77	21
HHH	8.53	4.3	66
EEEE	0.291	0.275	6
DDD	7.27	2.52	97
KKK	4.79	3.2	40
AAAA	0.324	0.357	10
YY	10.4	4.96	71
NN	0.643	0.605	6
JJJ	19.4	14.2	31
S	2.17	1.91	13
ZZZ	1.64	0.766	73
UU	4.51	4.29	5
ZZ	9.84	5.13	63

LDC #: 45174A-b

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: SVB

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications (A#)
		11 (lab dup)	d12-111	3392483 (3656052-14624088)		~~J/UJ/A~~ No Qual
		3 (dup)	d12-111	6643515 (1595328-6381348)		J/UJ/P
			d12-LLL	3135208 (783275-3133300)		
		5	d12-111	6955193 6 ( )		
			d12-LLL	3339620 2 ( )		
		8	d12-111	6711412 6 ( )		
			d12-LLL	3411230 7 ( )		
						see qpds

(DCB) = 1,4-Dichlorobenzene-d4
(NPT) = Naphthalene-d8
(ANT) = Acenaphthene-d10
(PHN) = Phenanthrene-d10
(CRY) = Chrysene-d12
(PRY) = Perylene-d12

Privileged and Confidential

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/29/2019	Acenaphthene	1	0.015	0.0088530127
		2	0.025	0.0174844030
		3	0.050	0.0363520050
		4	0.125	0.0953528780
		5	0.250	0.1872326480
		6	0.500	0.4189896000

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.81638005*	0.816000
Correlation Coefficient	*0.998902*	0.99700
Coefficient of Determination (r^2)	*0.997806*	

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/29/2019	Benzo(a)pyrene	1	0.015	0.012202480
		2	0.025	0.023791305
		3	0.050	0.049201355
		4	0.125	0.131370343
		5	0.250	0.278827900
		6	0.500	0.569758500

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*1.12903056*	1.130000
Correlation Coefficient	*0.999729*	1.00000
Coefficient of Determination (r^2)	*0.999458*	

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/29/2019	Benzo(g,h,i)perylene	1	0.015	0.012184192
		2	0.025	0.024221793
		3	0.050	0.048328508
		4	0.125	0.129520280
		5	0.250	0.286553700
		6	0.500	0.630932300

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*1.22633485*	1.230000
Correlation Coefficient	*0.998468*	0.99700
Coefficient of Determination (r^2)	*0.996939*	

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	1/30/19	~~Phenol~~ (1st internal standard) ~~24~~	500	473.14	473.42	5	5.3
			~~Naphthalene~~ (2nd internal standard) 111		489.14	488.78	2	2.2
			~~Fluorene~~ (3rd internal standard) 111		423.90	422.69	15	15.5
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: ~~45764-26~~

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: MG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ ~~d8-5~~					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
~~1,2-Dichlorobenzene-d4~~					

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ d10-46	1000.0	593.86	59	59	
2-Fluorobiphenyl d10-44	↓	805.71	81	81	
Terphenyl-d14 d14-DD7		882.19	88	88	
Phenol-d5 d12-222		804.91	80	80	
2-Fluorophenol d8-5		225.5	~~33~~23	23	
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
~~1,2-Dichlorobenzene-d4~~					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #42[illegible]

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 1
2nd Reviewer: JM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ug/g)		Sample Concentration (ug/g)	Spiked Sample Concentration (ug/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD *	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol			2.55								
Acenaphthene	104	103	~~82.9~~	80.9	83.5	75	75	79	79	5	~~85~~
Pentachlorophenol											
Pyrene	104	103	181	323	310	137	137	125	125	9	~~4~~

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. * ~~RPD~~ use %R to cal due to spike conc diff

LDC #: 45164S12V

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 9
2nd Reviewer: SVG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 200904-BS1/BS2

Compound	Spike Added (ug/g)		Spike Concentration (ug/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene	500	500	349	336	70	70	67	67	4	4
Pentachlorophenol										
Pyrene	500	500	635	648	127	127	130	130	2	2

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: MC

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2, 4F:

Conc. = $\frac{(632868)(2000)(0.13)(\quad)}{(1320496282)(0.818)(\quad)}$

= 2.49 ng/g

#	Sample ID	Compound	Reported Concentration ng/g	Calculated Concentration ( )	Qualification
	2	4F	2.49		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 11, 2019

Parameters: Polybrominated Diphenyl Ethers

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polybrominated Diphenyl Ethers by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A perfluorotributylamine (PFTBA) tune was performed.

All ion abundance requirements were met.

III. Initial Calibration

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/18/19	PBDE-209	36	B18-10022 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	PBDE-190 PBDE-209 PBDE-183	36 (50-150) 12 (50-150) -	28 (50-150) 7 (50-150) 45 (50-150)	J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	PBDE-209	53 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	PBDE-099 PBDE-100 PBDE-153 PBDE-154 PBDE-209	49 (≤25) 35 (≤25) 93 (≤25) 26 (≤25) 36 (≤25)	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20904-BS1/BS2 (All samples in SDG 1807003-008)	PBDE-190 PBDE-209	65 (70-130) 22 (70-130)	- 51 (70-130)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
20904-BS1/BS2 (B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115)	PBDE-209	79 (≤30)	J (all detects)	P
20904-BS1/BS2 (B18-10022 B18-10116)	PBDE-209	79 (≤30)	NA	-

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations were within validation criteria.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications were within validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, MS/MSD %R and RPD, DUP RPD, LCS/LCSD %R and RPD, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	PBDE-209	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (CH)
B18-10076	PBDE-190 PBDE-209 PBDE-183	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10076	PBDE-209	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10076	PBDE-099 PBDE-100 PBDE-153 PBDE-154 PBDE-209	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	PBDE-190 PBDE-209	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115	PBDE-209	J (all detects)	P	Laboratory control samples (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polybrominated Diphenyl Ethers - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A2c

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Date: 4/10/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: JW

METHOD: GC/MS Polybrominated Diphenyl Ethers (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	PFTBA
III.	Initial calibration/ICV	A	r^2. No ICV - not available
IV.	Continuing calibration	SW	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates / DUP	SW SW	
IX.	Laboratory control samples / CRM	SW	LCS/D, CRM
X.	Field duplicates	NO	D = B18-10116
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10076MS	56583MS	Sediment	07/18/18
10	B18-10076MSD	56583MSD	Sediment	07/18/18
11	B18-10076DUP	56583DUP	Sediment	07/18/18
12				
13				

LDC #: 45174A20

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: MG

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the ~~DFTPP~~ BFB performance results reviewed and found to be within the specified criteria?	✓			
~~Were all samples analyzed within the 12 hour clock criteria?~~	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?			✓	
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?			✓	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis?		✓	✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	

LDC #: 45174A2c

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: MV

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: ~~43174A~~

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: [illegible]
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	1/18/19	CCV	PBDE 209	36		1,3-8 (det+ND)	J/UJ/A (CH X)

CONCAL.2SD

LDC #: 45174A2c

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MP

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	9/10	BDE190	36 (50-150)	28 (50-150)	( )	2 (dets+ND)	J/UJ/A (<M)
		209	12 (↓)	7 (↓)	( )		↓
		183	( )	45 (↓)	( )		
		209	( )	( )	53 (≤25)	(ND dets)	J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	11	BDE099	( )	( )	49 (≤25)	2 (dets)	J dets/A (HD)
		100	( )	( )	35 ( )		↓
		153	( )	( )	93 ( )		
		154	( )	( )	26 ( )		
		209	( )	( )	36 (↓)		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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Privileged and Confidential

LDC #: ~~45174A2~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20904-BS1/	PBDE190	65 (70-130)	( )	( )	All (dets+ND)	J/UJ/P (LL)
		-BS2	209	22 (↓)	51 (70-130)	( )		↓
			209	( )	( )	79 (≤30)	(2-7=dets)	J dets/P (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC: 45174A2C

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewwe: [signature]
2nd Reviewer: JVG

Method: GC/MS (EPA SW 846 Method 8270D-NCI)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/17/2019	PBDE209	1	0.050	0.0029847
		2	0.125	0.0054766
		3	0.250	0.0161952
		4	0.500	0.0338814
		5	1.000	0.0785261

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.07541524*	0.075400
Correlation Coefficient	*0.996869*	0.99500
Coefficient of Determination (r^2)	*0.993748*	

LDC #: 43174A2c

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: V
2nd Reviewer: JV

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV (8:15)	1/18/19	~~Phenol~~ (1st internal standard) ~~PBDE 209~~	500	318.21	318.30	36	36.3
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: ~~45174A2a~~

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: JG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ DFPBDE	50.0	37.79	76	76	
2-Fluorobiphenyl FTBDE	V	40.26	81	81	
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
~~1,2-Dichlorobenzene-d4~~					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #43514

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: MG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ug/g)		Sample Concentration (ug/g)	Spiked Sample Concentration (ug/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported *	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
BDE047	10.4	10.3	0.747	12.2	12	110	110	109	109	1	2
BDE209	52.1	51.3	1.63	8.12	5.37	12	12	7	7	53	41

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. * Lab use TOR to calculate the RPD

LDC #: [illegible]

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 9
2nd Reviewer: SW

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 20904-BS1/-BS2

Compound	Spike Added (ng/g)		Spike Concentration (ng/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
PBDE47	50	50	53	51.7	106	106	115	115	8	8
↓ 209	250	250	54.4	127	22	22	51	51	79	80

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174A2C

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: JVP

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2, PBDE 209

Conc. = $\frac{(3242)(1000)(0.2123)}{(4710626)(0.0754)}$ = 1.92 ng/g

#	Sample ID	Compound	Reported Concentration (ng/g)	Calculated Concentration ( )	Qualification
	2	PBDE 209	1.92		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 11, 2019

Parameters: Fipronil & Degradates

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Fipronil and Degradates by Environmental Protection Agency (EPA) SW 846 Method 8270D-NCI

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

An autotune/perfluorotributylamine (PFTBA) tune was performed.

All ion abundance requirements were met.

III. Initial Calibration

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/17/19	Fipronil desulfinyl Fipronil sulfide	28.52 31.68	B18-10022 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	UJ (all non-detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Fipronil desulfinyl	156 (50-150)	164 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations were within validation criteria.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications were within validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Fipronil desulfinyl Fipronil sulfide	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (CH)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Fipronil & Degradates - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A2d

SDG #: 1807003-008

Laboratory: Physis Environmental Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 6/10/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JM

METHOD: GC/MS Fipronil & Degradates (EPA SW 846 Method 8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	Auto tune/~~DFTPA~~
III.	Initial calibration/~~ICV~~	A	r^2, No ICV - not available.
IV.	Continuing calibration	SW	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates/Dup	SW/A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D=8+B18-20116
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10076MS	56583MS	Sediment	07/18/18
10	B18-10076MSD	56583MSD	Sediment	07/18/18
11	B18-10076DUP	56583DUP	Sediment	07/18/18
12				
13				

LDC #: 45174A-2d

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: CA
2nd Reviewer: JA

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the ~~DFTPP~~ auto tune performance results reviewed and found to be within the specified criteria?	✓			
~~Were all samples analyzed within the 12 hour clock criteria?~~	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?			✓	
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?			✓	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?		✓		
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓	∅		
Were target compounds detected in the field duplicates?		✓	.	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓		∅	
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 43174A2d

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JV
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	1/17/19	FLP500CCV	*	28.52		1, 3-8 (ND)	~~J+ (all det.) / A / A~~ HC
			**	31.68			
		* Fipronil Desulfinyl ** Fipronil Sulfide					

Privileged and Confidential

LDC #: 45174d

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: Q
2nd Reviewer: JMG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	10/11	*	156 (50-150)	164 (50-150)	( )	2 (ND)	~~J dets/A (HM)~~
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
		* Fipronil Desulfinyl	( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Privileged and Confidential

LDC: 45174A2d

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewwe: 9
2nd Reviewer: SVG

Method: GC/MS (EPA SW 846 Method 8270D-NCI)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/16/2019	Fipronil	1	0.025	0.0114707
		2	0.050	0.0236117
		3	0.10	0.0433337
		4	0.25	0.1145072
		5	0.50	0.2378694

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.47097803*	0.471000
Correlation Coefficient	*0.999790*	0.99900
Coefficient of Determination (r^2)	*0.999579*	

LDC #: ~~45178A2d~~

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 1
2nd Reviewer: MG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	FIPSOCCV	1/17/19	~~Phenol~~ (1st internal standard) Fipronil	500	498.22	498.20	~~NR~~ 0	0.4
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene (6th internal standard)~~					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene (6th internal standard)~~					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12117EA-9

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 1
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ug/g)		Sample Concentration (ug/g)	Spiked Sample Concentration (ug/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
Fipronil	104	103	ND	146	144	140	140	140	140	0	1

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42115A31

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 9
2nd Reviewer: JM

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 209014-BS1/-BS2

Compound	Spike Added (ug/g)		Spike Concentration (ug/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
Fipronil	500	500	600	608	124	120	122	122	2	1

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45176A2d

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: JM

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. ND, Fipronil 20904-BS1,

Conc. = $\frac{(1632308)(1000)(1)(\quad)}{(5778169)(0.41)(\quad)(\quad)}$

= 600.0 ng/g

#	Sample ID	Compound	Reported Concentration (ng/g)	Calculated Concentration ( )	Qualification
	20904-BS1	Fipronil	600		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 11, 2019

Parameters: Synthetic Pyrethroid Pesticides

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Synthetic Pyrethroid Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D-MRM

All sample results were subjected to Level IV evaluation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered as not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

An autotune was performed.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/21/19	Cyhalothrin, total lambda Cyfluthrin Fluvalinate	48 26 31	All samples in SDG 1807003-008	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Compound	%D	Associated Samples	Flag	A or P
01/22/19	CCV	Allethrin Prallethrin Bifenthrin Cyhalothrin, total lambda Permethrin, cis- Permethrin, trans- Cyfluthrin	31 26 25 33 22 21 23	B18-10022 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogate Spikes

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Cyhalothrin, total lambda	169 (50-150)	165 (50-150)	NA	-
B18-10076MS/MSD (B18-10076)	Deltamethrin/Tralomethrin Prallethrin	37 (50-150) 38 (50-150)	44 (50-150) 38 (50-150)	UJ (all non-detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	Danitol (Fenpropathrin)	26 (≤25)	J (all detects)	A

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Affected Compound	Flag	A or P
B18-10077	2,2',5,5'-Tetrabromobiphenyl	163158 (163431-653724)	All compounds	NA	-
B18-10115	2,2',5,5'-Tetrabromobiphenyl	153574 (163431-653724)	All compounds	J (all detects)	P
B18-10116	2,2',5,5'-Tetrabromobiphenyl	139160 (163431-653724)	All compounds	NA	-

XII. Compound Quantitation

All compound quantitations were within validation criteria.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications were within validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to ICV %D, continuing calibration %D, MS/MSD %R, DUP RPD, internal standards area, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, as discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J/UJ) are usable for limited purposes only. Based upon the data validation, all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Cyhalothrin, total lambda Cyfluthrin Fluvalinate	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Initial calibration verification (%D) (LV)
B18-10022 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Allethrin Prallethrin Bifenthrin Cyhalothrin, total lambda Permethrin, cis- Permethrin, trans- Cyfluthrin	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (CH)
B18-10076	Deltamethrin/Tralomethrin Prallethrin	UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10076	Danitol (Fenpropathrin)	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10115	All compounds	J (all detects)	P	Internal standards (area) (*XI)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Synthetic Pyrethroid Pesticides - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A2e

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Date: 6/10/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JVG

METHOD: GC/MS Synthetic Pyrethroid Pesticides (EPA SW 846 Method 8270D-MRM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	Autotune
III.	Initial calibration/ICV	A/SW	r^2. ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /SUP	SW/SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D = B18-20116
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; SB=Source blank
N = Not provided/applicable; R = Rinsate; TB = Trip blank; OTHER:
SW = See worksheet; FB = Field blank; EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10076MS	56583MS	Sediment	07/18/18
10	B18-10076MSD	56583MSD	Sediment	07/18/18
11	B18-10076DUP	56583DUP	Sediment	07/18/18
12				
13				

LDC #: 45744A2e

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: CF
2nd Reviewer: JR

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the ~~DFTPP~~ performance results reviewed and found to be within the specified criteria?	✓			
~~Were all samples analyzed within the 12 hour clock criteria?~~	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of > 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?		✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	

LDC #: 45174A2e

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: JVG

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?		✓		
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pyrethroids

A. Allethrin				
B. Bifenthrin				
C. Cyfluthrin				
D. Cyhalothrin, Total Lambda				
E. Cypermethrin				
F. Danitol (Fenpropathrin)				
G. Deltamethrin/Tralomethrin				
H. Esfenvalerate				
I. Fluvalinate				
J. Permethrin, cis-				
K. Permethrin, trans-				
L. Prallethrin				
M. Fenvalerate				

LDC #: 45178A2e

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: PG
2nd Reviewer: MG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/21/19	ICV	D	18	All CN8	J/UJ/A (ICV)
			C	~~25~~ 26		
			I	31		↓

LDC #: 45174-2e

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	1/22/19	CCV	A	31		1, 3-8 (all but ND)	J (all det.) / A (all CH)
			L	26			
			B	25			
			D	33			
			J	22			
			K	21			
			C	23			

Privileged and Confidential

LDC #: ~~45174~~A2e

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	9/10	D	169 (50-150)	165 (50-150)	( )	2 (~~dets~~ ND)	J dets/A (HM)
		G	37 (↓)	44 (↓)	( )	〃	J/UJ/A (LM)
		L	38 ( )	38 ( )	( )		↓
	~~A~~		( )	( )	( )		
			( )	( )	( )		
	11	F	( )	( )	26 (≤25)	2 (dets)	J dets/A (FD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 45172e

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JV6

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications (*#)
		3 (ND)	*	163158 (16343-65324)		√ / ~~dets~~ / ~~UB~~ √ dets/p (all)
		T (dets+ND)	*	153574 ( )		
		8 (ND)	*	139160 ( )		

(DCB) = 1,4-Dichlorobenzene-d4
(NPT) = Naphthalene-d8
(ANT) = Acenaphthene-d10
(PHN) = Phenanthrene-d10
(CRY) = Chrysene-d12
(PRY) = Perylene-d12

* 2,2',5,5'-Tetrabromobiphenyl

Privileged and Confidential

LDC #: 45174A2e

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: JVG

Method: GCMS (EPA SW 846 Method 8270D-MRM)

Date	Channel/Instrument	Compound	Level	(Y) Response	(X) Conc.	(X^2) Conc.
1/21/2019	Pyr	Bifenthrin	1	0.1073254	25.000	625.00
			2	0.2767741	50.000	2500.00
			3	0.6477293	100.000	10000.00
			4	2.1673268	250.000	62500.00
			5	5.7435513	500.000	250000.00
			6	12.558465	1000.000	1000000.00

Regression Output

			Reported
Constant	c =	0.0000	0
Std Err of Y Est			
R Squared		0.9982465	0.9971
Degrees of Freedom			
	B =	A =	B=
X Coefficient(s)	8.89490E-03	3.7329E-06	0.008895
Std Err of Coef.			A=
			3.73E-06
Correlation Coefficient		0.999123	
Coefficient of Determination (r^2)	r^ 2	0.998247	1

LDC #: ~~45174-A2~~ e

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: SVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	1/20/19 (11:54)	~~Phenol~~ (1st internal standard) D	500	625.89	625.87	25	25.2
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene (6th internal standard)~~					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene (6th internal standard)~~					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #[illegible]

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: JM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ug/g)		Sample Concentration (ug/g)	Spiked Sample Concentration ug/g		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
B	104	103	6.47	148	147	~~136~~	136	136	136	0	0

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 40116A-C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 1
2nd Reviewer: JM

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 20904-BS1/-BS2

Compound	Spike Added (ug/g)		Spike Concentration (ng/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
B	500	500	467	470	93	93	94	94	1	1
-										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 15174A2e

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: JV6

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2 , B :

Conc. = $\frac{+(0.008895 + \sqrt{(0.008895)^2 - 4 \times (3.73e-06)(-64768)})}{(2)(3.73e-06)}$

$= 31.76959 \times 0.2123$

$= 6.745$ ng/g

#	Sample ID	Compound	Reported Concentration (ng/g)	Calculated Concentration ( )	Qualification
	2	B	6.78		

LDC Report# 45174A3a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 11, 2019

Parameters: Chlorinated Pesticides

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8270D and 8270D-NCI

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 with the following exceptions:

Date	Compound	r^2	Associated Samples	Flag	A or P
01/28/19	4,4'-DDD	0.988	B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	J (all detects) UJ (all non-detects)	A

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Compound	%D	Associated Samples	Flag	A or P
01/30/19	CCV	Dicofol Perthane Endrin aldehyde	68 24 24	B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Retention times of all compounds in the calibration standards were within the established retention time windows.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Endosulfan I Endosulfan II Endrin aldehyde	19 (50-150) 23 (50-150) 11 (50-150)	16 (50-150) 20 (50-150) 8 (50-150)	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
B18-10076MS/MSD (B18-10076)	Methoxychlor Perthane	157 (50-150) 154 (50-150)	160 (50-150) 152 (50-150)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	Endrin aldehyde	32 (≤25)	NA	-

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
20904-BS1/BS2 (All samples in SDG 1807003-008)	Endosulfan I	3 (70-130)	3 (70-130)	R (all non-detects)	P
20904-BS1/BS2 (All samples in SDG 1807003-008)	Endosulfan II Endrin aldehyde	21 (70-130) 10 (70-130)	22 (70-130) 29 (70-130)	UJ (all non-detects) UJ (all non-detects)	P
20904-BS1/BS2 (All samples in SDG 1807003-008)	Methoxychlor Perthane	142 (70-130) 131 (70-130)	144 (70-130) 135 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits.

X. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples.

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

XII. Target Compound Identification

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to LCS/LCSD %R, data were rejected in eight samples.

Due to initial calibration r^2, continuing calibration %D, MS/MSD %R, LCS/LCSD %R, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	4,4'-DDD	J (all detects) UJ (all non-detects)	A	Initial calibration (r^2) (BC)
B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Dicofol	UJ (all non-detects)	A	Continuing calibration (%D) (LC)
B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Perthane Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (CH)
B18-10076	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (LM)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Endosulfan I	R (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Endosulfan II Endrin aldehyde	UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (LL)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A3a

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Date: 6/10/19

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270D) (8270D-NCI)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/A	RSD ≤ 20%. r^2 ICV ≤ 20%
IV.	Continuing calibration	SW	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates MS/MSD	SW/A	
IX.	Laboratory control samples LCS/CRM	SW/A	LCS/D. CRM
X.	Field duplicates	ND	D-8+B18-20116
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10076MS	56583MS	Sediment	07/18/18
10	B18-10076MSD	56583MSD	Sediment	07/18/18
11	B18-10076DUP	56583DUP	Sediment	07/18/18
12				
13				

LDC #: 45174A2q

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: SM

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
~~Were all samples analyzed within the 12 hour clock criteria?~~ 24	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	∅	✓		
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-HCH	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. oxy-Chlordane
B. beta-HCH	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. cis-Nonachlor
C. delta-HCH	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ. trans-Nonachlor
D. gamma-HCH	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. cis-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. p,p'-DDE	SS. trans-Chlordane
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. p,p'-DDD	TT. alpha-Endosulphan
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. p,p'-DDT	UU. beta-Endosulphan
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. o,p'-DDT	VV. Endosulphan Sulphate
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. o,p'-DDE	WW. Mirex
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. o,p'-DDD	

LDC #: 45174A30

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JYG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? ≤ 0.990
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤20 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1/5/19	ICAL	M	$r^2 = 0.988$		3 SCND + RB1)	J/UJ/A (BC)

INICAL.2SD

LDC #: 45178A3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y N N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	1/30/19	CCV	Dicofol	68		3-8. (ND)	J (all A) (<C)
			Perthane	24			(all Cl)
			R	24			

Privileged and Confidential

LDC #: 4515~~8~~A3a
55

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		~~18/19~~ 9/10	H	19 (50-150)	16 (50-150)	( )	2 (ND)	J/UJ/A (LM)
			L	23 ( )	20 ( )	( )		
			R	11 ( )	8 ( )	( )		
			P	157 ( )	160 ( )	( )		J dets/A (HM)
			Perthane	154 ( )	152 ( )	( )		
			R	( )	( )	32 (≤25)		J dets/A (HD)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 45174A3a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20904-BS1/	H	3 (70-130)	3 (70-130)	( )	All (ND)	J/R/P (LL)
		-BS2	L	21 (↓)	22 (↓)	( )		J/UJ/P
			R	10 (↓)	29 (↓)	( )		↓
			P	142 (↓)	144 (↓)	( )		J+dets/P (HL)
			Perthane	131 (↓)	135 (↓)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/28/2019	BHC-gamma	1	0.025	0.0031155
		2	0.050	0.0069180
		3	0.100	0.0150108
		4	0.250	0.0437865
		5	0.500	0.0939866
		6	1.000	0.2007804

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.19662061*	0.197000
Correlation Coefficient	*0.999043*	0.99900
Coefficient of Determination (r^2)	*0.998088*	

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/28/2019	4,4-DDE	1	0.025	0.0569137
		2	0.050	0.1194369
		3	0.100	0.2562122
		4	0.250	0.8413428
		5	0.500	1.7659578
		6	1.000	3.6680792

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*3.61671642*	3.620000
Correlation Coefficient	*0.999297*	1.00000
Coefficient of Determination (r^2)	*0.998595*	

LDC #: 45172A31

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: SVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	1/30/19	~~Phenol~~ (1st internal standard) D	500	474.63	473.71	5	5.3
			~~Naphthalene~~ (2nd internal standard) ~~D~~ J	500	491.07	490.62	2	1.9
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene~~ (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene~~ (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174A29

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: A
2nd reviewer: MG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ PCB030	400.0	240.64	60	60	
2-Fluorobiphenyl 112		261.70	65	65	
Terphenyl-d14 198		324.37	81	81	
Phenol-d5 TCMX		201.68	50	50	
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
~~1,2-Dichlorobenzene-d4~~					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: ~~15174A39~~

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ug/g)		Sample Concentration (ug/g)	Spiked Sample Concentration (ug/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
J	104	103	3.68	100	98.5	93	93	92	92	1	1
T	V	↓	5.32	116	111	106	106	103	103	3	~~4~~ 1

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: ~~[illegible]~~

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: Q
2nd Reviewer: JVG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 20904-BS1/-BS2

Compound	Spike Added (ng/g)		Spike Concentration (ng/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
O	500	500	580	599	116	116	120	120	3	3
J	↓	↓	424	429	85	85	86	86	1	1

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174A39

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: AV6

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2, J:

Conc. = $\frac{(349760)(1000)(0.2123)(\quad)(\quad)}{(5736585)(3.62)(\quad)(\quad)}$

= 3.58 ng/g

#	Sample ID	Compound	Reported Concentration (ng/g)	Calculated Concentration ( )	Qualification
	2	J	3.58		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: 2018 Regional Harbor Monitoring Program

LDC Report Date: June 11, 2019

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Sample Delivery Group (SDG): 1807003-008

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
B18-10022	56582	Sediment	07/18/18
B18-10076	56583	Sediment	07/18/18
B18-10077	56584	Sediment	07/18/18
B18-10113	56586	Sediment	07/18/18
B18-10024	56587	Sediment	07/19/18
B18-10114	56589	Sediment	07/19/18
B18-10115	56590	Sediment	07/19/18
B18-10116	56591	Sediment	07/19/18
B18-10076MS	56583MS	Sediment	07/18/18
B18-10076MSD	56583MSD	Sediment	07/18/18
B18-10076DUP	56583DUP	Sediment	07/18/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Final Quality Assurance Project Plan, Regional Harbor Monitoring Program, San Diego, California (August 2013) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) as Congeners by Environmental Protection Agency (EPA) SW 846 Method 8270D

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Code Reference

BC The initial calibration (ICAL) curve did not meet method-specified criteria.
CH High continuing calibration verification (CCV) recovery. Analytical results may be biased high.
DL The analyte concentration was between the method detection limit (MDL) and the reporting limit (RL).
FB The analyte was detected in the sample and its associated field blank and the concentration detected in the sample is less than five times the concentration detected in the blanks.
H Holding time.
HD Potential analytical imprecision.
HL High LCS recovery. Analytical results may be biased high.
HM High MS recovery. Analytical results may be biased high.
HP High certified reference material (CRM) recovery. Analytical results may be biased high.
HV High initial calibration verification (ICV) recovery. Analytical results may be biased high.
LC Low CCV recovery. Analytical result may be biased low.
LL Low LCS recovery. Analytical result may be biased low.
LM Low MS recovery. Analytical result may be biased low.
LP Low CRM recovery. Analytical result may be biased low.
LS Low Surrogate recovery. Analytical results may be biased low.
LV Low ICV recovery. Analytical result may be biased low.
NC Calibration verification standard concentrations were outside the calibration range.
NQ There is lack of QC for this analyte.
RB The analyte was detected in the sample and its associated equipment blank and the concentration detected in the sample is less than five times the concentration detected in the blank.
TD The dissolved metals concentration is significantly higher than the total metal concentration.
*# Unusual problems found with the data. The number following the asterisk (*) will indicate the section in the validation report where a description of the problem can be found.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 with the following exceptions:

Date	Compound	r^2	Associated Samples	Flag	A or P
01/28/19	PCB-128 PCB-206	0.988 0.988	All samples in SDG 1807003-008	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates/Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076MS/MSD (B18-10076)	PCB-049	28 (≤25)	J (all detects)	A

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
B18-10076DUP (B18-10076)	PCB-031	26 (≤25)	J (all detects)	A

IX. Laboratory Control Samples/Certified Reference Materials

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Certified reference materials (CRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

CRM ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
20905-CRM1 (SRM 1944)	PCB-105 PCB-118 PCB-128 PCB-156	40 (60-140) 53 (60-140) 40 (60-140) 40 (60-140)	All samples in SDG 18077003-008	J (all detects) UJ (all non-detects)	A

X. Field Duplicates

Samples B18-10116 and B18-20116 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/g)		RPD
	B18-10116	B18-20116	
PCB-101	0.126	0.127	1
PCB-153	0.135	0.204	41
PCB-138	0.2U	0.224	Not calculable
PCB-149	0.2U	0.0987	Not calculable
PCB-206	0.25U	0.329	Not calculable
PCB-209	0.025U	1.05	Not calculable

XI. Compound Quantitation

All compound quantitations were within validation criteria.

All compounds reported below the reporting limit (RL) and above the minimum detection limit (MDL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 1807003-008	Compound reported below the RL and above the MDL	J (all detects)	A

XII. Target Compound Identifications

All target compound identifications were within validation criteria.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2, MS/MSD RPD, DUP RPD, CRM %R, and results reported below the RL and above the MDL, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG 1807003-008

Sample	Compound	Flag	A or P	Reason (Code)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	PCB-128 PCB-206	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (r^2) (BC)
B18-10076	PCB-049	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (HD)
B18-10076	PCB-031	J (all detects)	A	Duplicate sample analysis (RPD) (HD)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	PCB-105 PCB-118 PCB-128 PCB-156	J (all detects) UJ (all non-detects)	A	Certified reference material (%R) (LP)
B18-10022 B18-10076 B18-10077 B18-10113 B18-10024 B18-10114 B18-10115 B18-10116	Compound reported below the RL and above the MDL	J (all detects)	A	Compound quantitation (DL)

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

2018 Regional Harbor Monitoring Program
Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG 1807003-008

No Sample Data Qualified in this SDG

LDC #: 45174A3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 1807003-008

Level IV

Laboratory: Physis Environmental Laboratories, Inc.

Date: 4/10/19

Page: 1 of 1

Reviewer:

2nd Reviewer: JM

METHOD: GC/MS PCB as Congeners (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/A	r^2 ICV ≤ 30%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	SW/SW	
IX.	Laboratory control samples /CRM	SW/SW	LCS/D. CRM
X.	Field duplicates	SW	D=8+B18-20116
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	B18-10022	56582	Sediment	07/18/18
2	B18-10076	56583	Sediment	07/18/18
3	B18-10077	56584	Sediment	07/18/18
4	B18-10113	56586	Sediment	07/18/18
5	B18-10024	56587	Sediment	07/19/18
6	B18-10114	56589	Sediment	07/19/18
7	B18-10115	56590	Sediment	07/19/18
8	B18-10116	56591	Sediment	07/19/18
9	B18-10076MS	56583MS	Sediment	07/18/18
10	B18-10076MSD	56583MSD	Sediment	07/18/18
11	B18-10076DUP	56583DUP	Sediment	07/18/18
12				
13				

LDC #: 45184A36

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
~~Were all samples analyzed within the 12 hour clock criteria?~~	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓	✓		
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis?			✓	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 45174A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A	Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
Y N (N/A)	Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y (N) N/A	Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? ≤0.990
~~Y~~ N N/A	Did the initial calibration meet the acceptance criteria?
(Y) N N/A	Were all %RSDs and RRFs within the validation criteria of ≤20 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1/28/19	ICA2	PCB 128	r^2=0.988		All (dets+ND)	J/UJ/A (BC)
			↓ 206	0.988			↓

INICAL.2SD

LDC #: 45TK4A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	9/10	PCB049	( )	( )	28 (≤25)	2 (dets)	J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
	11	PCB031	( )	( )	26 (≤25)	2 (dets)	J dets/A (HD)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 45171A3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: JVG

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20905-CRM1	PCB105	40 (60-140)	( )	( )	All (dets + ND)	J/UJ/A (LP)
		(SRM 1944)	118	53 (↓)	( )	( )		↓
			128	40 ( )	( )	( )		
			156	40 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 45174A3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS PCB (EPA SW 846 Method 8270D)

Compound	Concentration (ng/g)		RPD
	8	B18-20116	
PCB101	0.126	0.127	1
PCB153	0.135	0.204	41
PCB138	0.2U	0.224	NC
PCB149	0.2U	0.0987	NC
PCB206	0.25U	0.329	NC
PCB209	.025U	1.05	NC

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/28/2019	PCB 118	1	0.010	0.0055245
		2	0.025	0.0159508
		3	0.050	0.0393212
		4	0.075	0.0644777
		5	0.100	0.0971032
		6	0.200	0.2013904

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*0.97271542*	0.973
Correlation Coefficient	*0.997378*	0.99800
Coefficient of Determination (r^2)	*0.994762*	

Method: GC/MS (EPA SW 846 Method 8270D)

Calibration Date	Analyte	Standard	(Y) Concentration	(X) Area
1/28/2019	PCB180	1	0.010	0.0144717
		2	0.025	0.0389875
		3	0.050	0.0698737
		4	0.075	0.1220533
		5	0.100	0.1599527
		6	0.200	0.3820543

Linear through the origin

	calculated	***Reported***
Constant	*0.000000*	0.0000
X Coefficient(s)	*1.80413283*	1.800000
Correlation Coefficient	*0.996085*	0.99200
Coefficient of Determination (r^2)	*0.992186*	

LDC #: 45TRA36

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: a
2nd Reviewer: JM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV		~~Phenol~~ (1st internal standard) PCB118	100	96.12	96.09	4	4
			~~Naphthal~~ene (2nd internal standard) PCB180	100	89.97	89.97	10	10
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene (6th internal standard)~~					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			~~Benzo(a)pyrene (6th internal standard)~~					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45124A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: JM

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ug/g)		Sample Concentration (ug/g)	Spiked Sample Concentration (ug/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol											
Pyrene											
PCB 118	10.4	10.3	9.49	18.3	20	85	85	102	102	18	18
↓ 180	↓	↓	5.67	15.4	15.2	94	94	93	93	1	1

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174A36

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JM

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 20904-BS1

Compound	Spike Added (ng/g)		Spike Concentration (ng/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol										
Pyrene										
PCB118	50	50	52.1	52.7	104	104	105	105	1	1
↓ 180	↓	↓	56.2	59.0	112	112	118	118	5	5

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 45174-A3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: JVG

METHOD: GC/MS SVOA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 2, PCB118

Conc. = $\frac{(118)(25)(1000)(0.2123)(\quad)(\quad)}{(2639)(20)(0.973)(\quad)(\quad)}$

= 9.65 ng/g

#	Sample ID	Compound	Reported Concentration ng/g	Calculated Concentration ( )	Qualification
	2	PCB 118	9.65		