



ALS Environmental
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www.alsglobal.com

November 02, 2018

Analytical Report for Service Request No: K1808703

Amy Dahl
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

RE: Portland Harbor Pre-Remedial Design Investigation / 60566335

Dear Amy,

Enclosed are the results of the sample(s) submitted to our laboratory September 11, 2018
For your reference, these analyses have been assigned our service request number **K1808703**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager



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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
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Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation
Sample Matrix: Sediment, Water

Service Request: K1808703
Date Received: 09/11/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Two sediment samples and one water sample were received for analysis at ALS Environmental on 09/11/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored both frozen at -20°C and in a refrigerator at 4°C upon receipt at the laboratory.

Semivolatiles by GC/MS:

Method ALS SOP, Organochlorine Pesticides by GC/MS/MS 10/16/2018: The upper control criterion was exceeded for Aldrin and Heptachlor in Laboratory Control Sample (LCS) KQ1813926-03. The analytes in question were not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method ALS SOP, Organochlorine Pesticides by GC/MS/MS 10/24/2018: The following analytes were flagged as outside the control criterion for Continuing Calibration Verification (CCV) MS42\102518F004.D: 4,4'-DDE. In accordance with the EPA Method, 80% or more of the CCV analytes must have passed within 20% of the true value. The remaining analytes are allowed a 40% difference as per the ALS SOP. The CCV met these criteria. No further corrective action was required.



Approved by _____

Date 11/02/2018



Chain of Custody

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KI 808703

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SURFACE SEDIMENT CHAIN OF CUSTODY

Client Contact: [Blank] Project Contact: Amy Dahl / Chelsey Cook Site Contact: Jennifer Ray 9/11/2018 COC No: 1

AECOM Tel: (206) 438-2261 / (206) 438-2010 Laboratory Contact: Howard-Holmes Carrier: Courier 1 of 1 pages

1111 3rd Ave Suite 1600
 Seattle, WA 98101
 Phone: (206) 438-2700 Fax: 1+(866) 495-5288
 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
 Portland, OR
 Project #: 60566335 Study: Surface Sediment
 Sample Type: D/U
 Analysis Turnaround Time
 Calendar (C) or Work Days (W)
 21 days
 Other _ASAP_____

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	Parameters														Sample Specific Notes														
								H																												
PDI-SG-B431	9/7/2018	12:08	SS		JH	7	H																													
PDI-SG-B479	9/7/2018	9:58	SS		JH	7	H																													
PDI-RB-VV-090718	9/7/2018	14:50	W		JH	2			x																											

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column
 Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid
 Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Sample Disposal
 Return To Client Disposal By Lab Archive For 12 Months

Special Instructions/QC Requirements & Comments:
 Hold (H) remaining analyses pending further instruction.

Relinquished by:	Company: <i>Aecom</i>	Date/Time: <i>9/11/18 10:10</i>	Received by:	Company: <i>ALV</i>	Date/Time: <i>9/11/18 10:10</i>
Relinquished by:	Company:	Date/Time:	Received by:	Company: <i>ALS</i>	Date/Time: <i>9/11/18 11:50</i>
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:



PC HZ

Cooler Receipt and Preservation Form

Client AECOM Service Request K18 08703
 Received: 9-11-18 Opened: 9-11-18 By: [Signature] Unloaded: 9-11-18 By: [Signature]

- Samples were received via? **USPS** Fed Ex **UPS** **DHL** **PDX** Courier **Hand Delivered**
- Samples were received in: (circle) Cooler **Box** **Envelope** **Other** NA
- Were custody seals on coolers? **NA** Y **N** If yes, how many and where? 1 Front
 If present, were custody seals intact? Y **N** If present, were they signed and dated? Y **N**

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
1.0	1.0	5.4	5.4	0	360			<u>NA</u>	<u>Y</u>

- Packing material: **Inserts** **Baggies** Bubble Wrap **Gel Packs** Wet Ice **Dry Ice** **Sleeves**
- Were custody papers properly filled out (ink, signed, etc.)? **NA** Y **N**
- Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* **NA** Y **N**
 If applicable, tissue samples were received: **Frozen** **Partially Thawed** **Thawed**
- Were all sample labels complete (i.e analysis, preservation, etc.)? **NA** Y **N**
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* **NA** Y **N**
- Were appropriate bottles/containers and volumes received for the tests indicated? **NA** Y **N**
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA **Y** **N**
- Were VOA vials received without headspace? *Indicate in the table below.* NA **Y** **N**
- Was C12/Res negative? NA **Y** **N**

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions:



Total Solids

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K1808703
Date Collected: 09/7/18
Date Received: 09/11/18
Units: Percent
Basis: As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
PDI-SG-B431	K1808703-001	66.2	-	-	1	09/13/18 17:00	
PDI-SG-B479	K1808703-002	54.5	-	-	1	09/13/18 17:00	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K1808703
Date Collected: NA
Date Received: NA

Units: Percent
Basis: As Received

Replicate Sample Summary
Inorganic Parameters

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1808544-001DUP	-	56.5	56.4	56.5	<1	20	09/13/18

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K1808703
Date Collected: NA
Date Received: NA

Units: Percent
Basis: NA

Replicate Sample Summary
Inorganic Parameters

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1808628-008DUP	-	76.8	75.7	76.3	1	20	09/13/18

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



Organochlorine Pesticides

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: PDI-SG-B431
Lab Code: K1808703-001

Service Request: K1808703
Date Collected: 09/07/18 12:08
Date Received: 09/11/18 11:50

Units: ug/Kg
Basis: Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.30	0.19	1	10/25/18 15:15	10/11/18	
2,4'-DDE	ND U	0.30	0.24	1	10/25/18 15:15	10/11/18	
2,4'-DDT	ND U	0.30	0.28	1	10/25/18 15:15	10/11/18	
4,4'-DDD	0.22 J	0.30	0.11	1	10/25/18 15:15	10/11/18	
4,4'-DDE	0.30 J	0.30	0.21	1	10/25/18 15:15	10/11/18	*
4,4'-DDT	ND U	0.30	0.14	1	10/25/18 15:15	10/11/18	
Aldrin	ND U	0.30	0.24	1	10/25/18 15:15	10/11/18	
alpha-Chlordane	ND U	0.59	0.19	1	10/25/18 15:15	10/11/18	
cis-Nonachlor	ND U	0.30	0.29	1	10/25/18 15:15	10/11/18	
Dieldrin	ND U	0.59	0.23	1	10/25/18 15:15	10/11/18	
gamma-BHC (Lindane)	ND U	0.30	0.092	1	10/25/18 15:15	10/11/18	
gamma-Chlordane	ND U	0.59	0.19	1	10/25/18 15:15	10/11/18	
Heptachlor	ND U	0.30	0.12	1	10/25/18 15:15	10/11/18	
Oxychlordane	ND U	0.59	0.39	1	10/25/18 15:15	10/11/18	
trans-Nonachlor	ND U	0.59	0.18	1	10/25/18 15:15	10/11/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	77	5 - 120	10/25/18 15:15	
S_4,4'-DDT-d4	81	13 - 200	10/25/18 15:15	
S_Aldrin-13C12	53	10 - 143	10/25/18 15:15	
S_Endrin-13C12	79	20 - 157	10/25/18 15:15	
S_GBHCD6	51	5 - 124	10/25/18 15:15	
S_Heptachlor-13C10	65	10 - 177	10/25/18 15:15	
S_Heptachlrepox13C10	53	8 - 146	10/25/18 15:15	
S_Oxychlordane-13C10	54	5 - 144	10/25/18 15:15	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: PDI-SG-B479
Lab Code: K1808703-002

Service Request: K1808703
Date Collected: 09/07/18 09:58
Date Received: 09/11/18 11:50

Units: ug/Kg
Basis: Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.36	0.23	1	10/16/18 22:46	10/5/18	
2,4'-DDE	ND U	0.36	0.29	1	10/16/18 22:46	10/5/18	
2,4'-DDT	ND U	0.36	0.34	1	10/16/18 22:46	10/5/18	
4,4'-DDD	0.39	0.36	0.13	1	10/16/18 22:46	10/5/18	
4,4'-DDE	0.63	0.36	0.26	1	10/16/18 22:46	10/5/18	
4,4'-DDT	ND U	0.36	0.17	1	10/16/18 22:46	10/5/18	
Aldrin	ND U	0.36	0.29	1	10/16/18 22:46	10/5/18	
alpha-Chlordane	ND U	0.72	0.23	1	10/16/18 22:46	10/5/18	
cis-Nonachlor	ND U	0.36	0.35	1	10/16/18 22:46	10/5/18	
Dieldrin	ND U	0.72	0.28	1	10/16/18 22:46	10/5/18	
gamma-BHC (Lindane)	ND U	0.36	0.12	1	10/16/18 22:46	10/5/18	
gamma-Chlordane	ND U	0.72	0.23	1	10/16/18 22:46	10/5/18	
Heptachlor	ND U	0.36	0.14	1	10/16/18 22:46	10/5/18	
Oxychlordane	ND U	0.72	0.47	1	10/16/18 22:46	10/5/18	
trans-Nonachlor	ND U	0.72	0.21	1	10/16/18 22:46	10/5/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	96	5 - 120	10/16/18 22:46	
S_4,4'-DDT-d4	110	13 - 200	10/16/18 22:46	
S_Aldrin-13C12	64	10 - 143	10/16/18 22:46	
S_Endrin-13C12	102	20 - 157	10/16/18 22:46	
S_GBHCD6	57	5 - 124	10/16/18 22:46	
S_Heptachlor-13C10	72	10 - 177	10/16/18 22:46	
S_Heptachlrepox13C10	68	8 - 146	10/16/18 22:46	
S_Oxychlordane-13C10	63	5 - 144	10/16/18 22:46	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-RB-VV-090718
Lab Code: K1808703-003

Service Request: K1808703
Date Collected: 09/07/18 14:50
Date Received: 09/11/18 11:50

Units: ng/L
Basis: NA

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3535A

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.58	0.13	1	09/24/18 18:57	9/14/18	
2,4'-DDE	ND U	0.58	0.13	1	09/24/18 18:57	9/14/18	
2,4'-DDT	ND U	0.58	0.11	1	09/24/18 18:57	9/14/18	
4,4'-DDD	0.13 J	0.58	0.12	1	09/24/18 18:57	9/14/18	
4,4'-DDE	ND U	0.58	0.088	1	09/24/18 18:57	9/14/18	
4,4'-DDT	ND U	0.58	0.11	1	09/24/18 18:57	9/14/18	
Aldrin	ND U	1.2	0.54	1	09/24/18 18:57	9/14/18	
alpha-Chlordane	ND U	0.58	0.16	1	09/24/18 18:57	9/14/18	
cis-Nonachlor	ND U	0.58	0.20	1	09/24/18 18:57	9/14/18	
Dieldrin	ND U	5.8	0.87	1	09/24/18 18:57	9/14/18	
gamma-BHC (Lindane)	ND U	0.58	0.35	1	09/24/18 18:57	9/14/18	
gamma-Chlordane	ND U	0.58	0.20	1	09/24/18 18:57	9/14/18	
Heptachlor	ND U	1.2	0.14	1	09/24/18 18:57	9/14/18	
Oxychlordane	ND U	5.8	2.4	1	09/24/18 18:57	9/14/18	
trans-Nonachlor	ND U	0.58	0.14	1	09/24/18 18:57	9/14/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	69	5 - 120	09/24/18 18:57	
S_4,4'-DDT-d4	87	13 - 200	09/24/18 18:57	
S_Aldrin-13C12	47	5 - 126	09/24/18 18:57	
S_Endrin-13C12	96	20 - 157	09/24/18 18:57	
S_GBHCD6	52	5 - 124	09/24/18 18:57	
S_Heptachlor-13C10	56	5 - 128	09/24/18 18:57	
S_Heptachlrepox13C10	59	8 - 146	09/24/18 18:57	
S_Oxychlordane-13C10	53	5 - 144	09/24/18 18:57	

ALS Group USA, Corp.
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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: Batch QC
Lab Code: K1809944-011

Service Request: K1808703
Date Collected: NA
Date Received: NA

Units: ug/Kg
Basis: Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.13	0.084	1	10/24/18 17:45	10/11/18	
2,4'-DDE	0.14	0.13	0.11	1	10/24/18 17:45	10/11/18	
2,4'-DDT	2.1	0.13	0.13	1	10/24/18 17:45	10/11/18	
4,4'-DDD	1.7	0.13	0.047	1	10/24/18 17:45	10/11/18	
4,4'-DDE	2.2	0.13	0.094	1	10/24/18 17:45	10/11/18	
4,4'-DDT	ND U	0.13	0.063	1	10/24/18 17:45	10/11/18	
Aldrin	ND U	0.13	0.11	1	10/24/18 17:45	10/11/18	
alpha-Chlordane	0.16 J	0.27	0.083	1	10/24/18 17:45	10/11/18	
cis-Nonachlor	ND U	0.13	0.13	1	10/24/18 17:45	10/11/18	
Dieldrin	ND U	0.27	0.11	1	10/24/18 17:45	10/11/18	
gamma-BHC (Lindane)	ND U	0.13	0.042	1	10/24/18 17:45	10/11/18	
gamma-Chlordane	0.24 J	0.27	0.086	1	10/24/18 17:45	10/11/18	
Heptachlor	ND U	0.13	0.052	1	10/24/18 17:45	10/11/18	
Oxychlordane	ND U	0.27	0.18	1	10/24/18 17:45	10/11/18	
trans-Nonachlor	0.17 J	0.27	0.078	1	10/24/18 17:45	10/11/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	74	5 - 120	10/24/18 17:45	
S_4,4'-DDT-d4	88	13 - 200	10/24/18 17:45	
S_Aldrin-13C12	52	10 - 143	10/24/18 17:45	
S_Endrin-13C12	78	20 - 157	10/24/18 17:45	
S_GBHCd6	55	5 - 124	10/24/18 17:45	
S_Heptachlor-13C10	74	10 - 177	10/24/18 17:45	
S_Heptachlrepox13C10	57	8 - 146	10/24/18 17:45	
S_Oxychlordane-13C10	53	5 - 144	10/24/18 17:45	

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ1812810-03

Service Request: K1808703
Date Collected: NA
Date Received: NA
Units: ng/L
Basis: NA

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3535A

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.50	0.11	1	09/24/18 18:05	9/14/18	
2,4'-DDE	ND U	0.50	0.11	1	09/24/18 18:05	9/14/18	
2,4'-DDT	ND U	0.50	0.087	1	09/24/18 18:05	9/14/18	
4,4'-DDD	ND U	0.50	0.10	1	09/24/18 18:05	9/14/18	
4,4'-DDE	ND U	0.50	0.075	1	09/24/18 18:05	9/14/18	
4,4'-DDT	ND U	0.50	0.088	1	09/24/18 18:05	9/14/18	
Aldrin	0.47 J	1.0	0.46	1	09/24/18 18:05	9/14/18	
alpha-Chlordane	ND U	0.50	0.13	1	09/24/18 18:05	9/14/18	
cis-Nonachlor	ND U	0.50	0.17	1	09/24/18 18:05	9/14/18	
Dieldrin	ND U	5.0	0.74	1	09/24/18 18:05	9/14/18	
gamma-BHC (Lindane)	ND U	0.50	0.30	1	09/24/18 18:05	9/14/18	
gamma-Chlordane	ND U	0.50	0.17	1	09/24/18 18:05	9/14/18	
Heptachlor	ND U	1.0	0.12	1	09/24/18 18:05	9/14/18	
Oxychlordane	ND U	5.0	2.0	1	09/24/18 18:05	9/14/18	
trans-Nonachlor	ND U	0.50	0.12	1	09/24/18 18:05	9/14/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	83	5 - 120	09/24/18 18:05	
S_4,4'-DDT-d4	89	13 - 200	09/24/18 18:05	
S_Aldrin-13C12	56	5 - 126	09/24/18 18:05	
S_Endrin-13C12	86	20 - 157	09/24/18 18:05	
S_GBHCd6	50	5 - 124	09/24/18 18:05	
S_Heptachlor-13C10	56	5 - 128	09/24/18 18:05	
S_Heptachlrepox13C10	61	8 - 146	09/24/18 18:05	
S_Oxychlordane-13C10	56	5 - 144	09/24/18 18:05	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: KQ1814154-04

Service Request: K1808703
Date Collected: NA
Date Received: NA

Units: ug/Kg
Basis: Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.10	0.063	1	10/16/18 21:36	10/5/18	
2,4'-DDE	ND U	0.10	0.079	1	10/16/18 21:36	10/5/18	
2,4'-DDT	ND U	0.10	0.094	1	10/16/18 21:36	10/5/18	
4,4'-DDD	ND U	0.10	0.035	1	10/16/18 21:36	10/5/18	
4,4'-DDE	ND U	0.10	0.070	1	10/16/18 21:36	10/5/18	
4,4'-DDT	ND U	0.10	0.047	1	10/16/18 21:36	10/5/18	
Aldrin	ND U	0.10	0.079	1	10/16/18 21:36	10/5/18	
alpha-Chlordane	ND U	0.20	0.062	1	10/16/18 21:36	10/5/18	
cis-Nonachlor	ND U	0.10	0.097	1	10/16/18 21:36	10/5/18	
Dieldrin	ND U	0.20	0.077	1	10/16/18 21:36	10/5/18	
gamma-BHC (Lindane)	ND U	0.10	0.031	1	10/16/18 21:36	10/5/18	
gamma-Chlordane	ND U	0.20	0.064	1	10/16/18 21:36	10/5/18	
Heptachlor	ND U	0.10	0.039	1	10/16/18 21:36	10/5/18	
Oxychlordane	ND U	0.20	0.13	1	10/16/18 21:36	10/5/18	
trans-Nonachlor	ND U	0.20	0.058	1	10/16/18 21:36	10/5/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	96	5 - 120	10/16/18 21:36	
S_4,4'-DDT-d4	105	13 - 200	10/16/18 21:36	
S_Aldrin-13C12	63	10 - 143	10/16/18 21:36	
S_Endrin-13C12	97	20 - 157	10/16/18 21:36	
S_GBHCD6	57	5 - 124	10/16/18 21:36	
S_Heptachlor-13C10	71	10 - 177	10/16/18 21:36	
S_Heptachlrepox13C10	66	8 - 146	10/16/18 21:36	
S_Oxychlordane-13C10	63	5 - 144	10/16/18 21:36	

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: KQ1814562-04

Service Request: K1808703
Date Collected: NA
Date Received: NA

Units: ug/Kg
Basis: Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.063	0.063	1	10/24/18 14:49	10/11/18	
2,4'-DDE	ND U	0.079	0.079	1	10/24/18 14:49	10/11/18	
2,4'-DDT	ND U	0.094	0.094	1	10/24/18 14:49	10/11/18	
4,4'-DDD	ND U	0.049	0.035	1	10/24/18 14:49	10/11/18	
4,4'-DDE	ND U	0.070	0.070	1	10/24/18 14:49	10/11/18	
4,4'-DDT	ND U	0.049	0.047	1	10/24/18 14:49	10/11/18	
Aldrin	ND U	0.079	0.079	1	10/24/18 14:49	10/11/18	
alpha-Chlordane	ND U	0.098	0.062	1	10/24/18 14:49	10/11/18	
cis-Nonachlor	ND U	0.097	0.097	1	10/24/18 14:49	10/11/18	
Dieldrin	ND U	0.20	0.077	1	10/24/18 14:49	10/11/18	
gamma-BHC (Lindane)	ND U	0.049	0.031	1	10/24/18 14:49	10/11/18	
gamma-Chlordane	ND U	0.098	0.064	1	10/24/18 14:49	10/11/18	
Heptachlor	ND U	0.049	0.039	1	10/24/18 14:49	10/11/18	
Oxychlordane	ND U	0.20	0.13	1	10/24/18 14:49	10/11/18	
trans-Nonachlor	ND U	0.098	0.058	1	10/24/18 14:49	10/11/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	82	5 - 120	10/24/18 14:49	
S_4,4'-DDT-d4	95	13 - 200	10/24/18 14:49	
S_Aldrin-13C12	58	10 - 143	10/24/18 14:49	
S_Endrin-13C12	84	20 - 157	10/24/18 14:49	
S_GBHCd6	52	5 - 124	10/24/18 14:49	
S_Heptachlor-13C10	68	10 - 177	10/24/18 14:49	
S_Heptachlrepox13C10	56	8 - 146	10/24/18 14:49	
S_Oxychlordane-13C10	53	5 - 144	10/24/18 14:49	

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_4,4'DDD-d4	S_4,4'-DDT-d4	S_Aldrin-13C12
		5-120	13-200	10-143
PDI-SG-B431	K1808703-001	77	81	53
PDI-SG-B479	K1808703-002	96	110	64
Batch QC	K1809944-011	74	88	52
Method Blank	KQ1814154-04	96	105	63
Method Blank	KQ1814562-04	82	95	58
Lab Control Sample	KQ1814154-03	101	102	69
Lab Control Sample	KQ1814562-03	80	82	64
PDI-SG-B479	KQ1814154-01	89	96	59
PDI-SG-B479	KQ1814154-02	95	104	61
Batch QC	KQ1814562-01	76	80	49
Batch QC	KQ1814562-02	58	73	46

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Endrin-13C12	S_GBHCD6	S_Heptachlor-13C10
		20-157	5-124	10-177
PDI-SG-B431	K1808703-001	79	51	65
PDI-SG-B479	K1808703-002	102	57	72
Batch QC	K1809944-011	78	55	74
Method Blank	KQ1814154-04	97	57	71
Method Blank	KQ1814562-04	84	52	68
Lab Control Sample	KQ1814154-03	100	63	73
Lab Control Sample	KQ1814562-03	86	55	67
PDI-SG-B479	KQ1814154-01	89	57	65
PDI-SG-B479	KQ1814154-02	93	53	68
Batch QC	KQ1814562-01	76	45	61
Batch QC	KQ1814562-02	67	41	59

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Heptachlrepx13C10	S_Oxychlorane-13C10
		8-146	5-144
PDI-SG-B431	K1808703-001	53	54
PDI-SG-B479	K1808703-002	68	63
Batch QC	K1809944-011	57	53
Method Blank	KQ1814154-04	66	63
Method Blank	KQ1814562-04	56	53
Lab Control Sample	KQ1814154-03	69	64
Lab Control Sample	KQ1814562-03	63	57
PDI-SG-B479	KQ1814154-01	61	57
PDI-SG-B479	KQ1814154-02	64	60
Batch QC	KQ1814562-01	51	47
Batch QC	KQ1814562-02	46	42

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_4,4'DDD-d4	S_4,4'-DDT-d4	S_Aldrin-13C12
		5-120	13-200	10-143
PDI-RB-VV-090718	K1808703-003	69	87	47
Method Blank	KQ1812810-03	83	89	56
Lab Control Sample	KQ1812810-01	81	88	51
Duplicate Lab Control Sample	KQ1812810-02	92	91	55

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Endrin-13C12	S_GBHCD6	S_Heptachlor-13C10
		20-157	5-124	10-177
PDI-RB-VV-090718	K1808703-003	96	52	56
Method Blank	KQ1812810-03	86	50	56
Lab Control Sample	KQ1812810-01	95	52	56
Duplicate Lab Control Sample	KQ1812810-02	101	59	68

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Heptachlrepx13C10	S_Oxychlordane-13C10
		8-146	5-144
PDI-RB-VV-090718	K1808703-003	59	53
Method Blank	KQ1812810-03	61	56
Lab Control Sample	KQ1812810-01	56	58
Duplicate Lab Control Sample	KQ1812810-02	67	62

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request:K1808703
Date Analyzed:10/16/18 19:15

Internal Standard Area and RT SUMMARY
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\101618\101618F018.D
Instrument ID: K-MS-42
Analysis Method: ALS SOP

Lab Code:KQ1814940-01
Analysis Lot:611291
Signal ID:1

	Pyrene-d10	
	Area	RT
Result ==>	29,608,905	9.764
Upper Limit ==>	59,217,810	10.26
Lower Limit ==>	14,804,453	9.26

Associated Analyses

Method Blank	KQ1814154-04	50389640.04	9.764
Lab Control Sample	KQ1814154-03	43386289.29	9.757
PDI-SG-B479MS	KQ1814154-01	56432046.18	9.757
PDI-SG-B479DMS	KQ1814154-02	58823081	9.764
PDI-SG-B479	K1808703-002	51284940.15	9.764

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request:K1808703
Date Analyzed:10/24/18 14:31

Internal Standard Area and RT SUMMARY
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\102418\102418F004.D
Instrument ID: K-MS-42
Analysis Method: ALS SOP

Lab Code:KQ1815515-01
Analysis Lot:612484
Signal ID:1

	Pyrene-d10	
	Area	RT
Result ==>	43,748,877	9.779
Upper Limit ==>	87,497,754	10.28
Lower Limit ==>	21,874,439	9.28

Associated Analyses

Method Blank	KQ1814562-04	43583945.63	9.773
Lab Control Sample	KQ1814562-03	39415851.84	9.764
Batch QCMS	KQ1814562-01	47130893.2	9.773
Batch QCDMS	KQ1814562-02	52926237.67	9.773
Batch QC	K1809944-011	46809996.74	9.780

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request:K1808703
Date Analyzed:10/25/18 14:01

Internal Standard Area and RT SUMMARY
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\102518\102518F004.D
Instrument ID: K-MS-42
Analysis Method: ALS SOP

Lab Code:KQ1815597-02
Analysis Lot:612678
Signal ID:1

	Pyrene-d10	
	Area	RT
Result ==>	33,363,590	9.786
Upper Limit ==>	66,727,180	10.29
Lower Limit ==>	16,681,795	9.29

Associated Analyses

PDI-SG-B431	K1808703-001	42637839.16	9.768
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ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Collected: 09/07/18
Date Received: 09/11/18
Date Analyzed: 10/16/18
Date Extracted: 10/5/18

Duplicate Matrix Spike Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: PDI-SG-B479
Lab Code: K1808703-002
Analysis Method: ALS SOP
Prep Method: EPA 3541

Units: ug/Kg
Basis: Dry

Analyte Name	Sample Result	Result	Matrix Spike KQ1814154-01		Duplicate Matrix Spike KQ1814154-02		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
2,4'-DDD	ND U	5.89	7.11	83	5.65	7.06	80	32-169	4	40
2,4'-DDE	ND U	5.83	7.11	82	5.97	7.06	85	43-155	3	40
2,4'-DDT	ND U	6.61	7.11	93	6.48	7.06	92	55-161	2	40
4,4'-DDD	0.39	7.71	7.11	103	7.33	7.06	98	10-190	5	40
4,4'-DDE	0.63	5.73	7.11	72	5.43	7.06	68	35-162	5	40
4,4'-DDT	ND U	6.80	7.11	96	6.98	7.06	99	24-183	3	40
Aldrin	ND U	7.43	7.11	104	7.24	7.06	103	52-151	2	40
alpha-Chlordane	ND U	7.99	7.11	112	8.15	7.06	115	31-156	2	40
cis-Nonachlor	ND U	7.34	7.11	103	6.86	7.06	97	27-144	7	40
Dieldrin	ND U	5.70	7.11	80	5.26	7.06	75	28-150	8	40
gamma-BHC (Lindane)	ND U	6.26	7.11	88	6.85	7.06	97	64-135	9	40
gamma-Chlordane	ND U	7.83	7.11	110	7.82	7.06	111	31-158	<1	40
Heptachlor	ND U	7.38	7.11	104	7.37	7.06	104	76-117	<1	40
Oxychlordane	ND U	7.03	7.11	99	7.36	7.06	104	53-144	5	40
trans-Nonachlor	ND U	7.60	7.11	107	7.29	7.06	103	35-153	4	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Analyzed: 10/16/18
Date Extracted: 10/05/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Units: ug/Kg
Basis: Dry
Analysis Lot: 611291

Lab Control Sample
KQ1814154-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4'-DDD	1.53	2.00	77	73-122
2,4'-DDE	1.65	2.00	83	54-145
2,4'-DDT	1.89	2.00	95	77-118
4,4'-DDD	1.98	2.00	99	74-117
4,4'-DDE	1.43	2.00	71	66-132
4,4'-DDT	1.97	2.00	98	78-116
Aldrin	2.06	2.00	103	74-122
alpha-Chlordane	2.34	2.00	117	74-130
cis-Nonachlor	2.01	2.00	101	69-134
Dieldrin	1.50	2.00	75	62-131
gamma-BHC (Lindane)	1.85	2.00	93	79-116
gamma-Chlordane	2.28	2.00	114	76-128
Heptachlor	2.15	2.00	108	81-114
Oxychlordane	2.12	2.00	106	59-141
trans-Nonachlor	2.16	2.00	108	76-124

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Analyzed: 10/24/18
Date Extracted: 10/11/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Units: ug/Kg
Basis: Dry
Analysis Lot: 612484

Lab Control Sample
KQ1814562-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4'-DDD	1.78	2.00	89	73-122
2,4'-DDE	1.69	2.00	84	54-145
2,4'-DDT	1.88	2.00	94	77-118
4,4'-DDD	2.04	2.00	102	74-117
4,4'-DDE	1.34	2.00	67	66-132
4,4'-DDT	2.02	2.00	101	78-116
Aldrin	1.94	2.00	97	74-122
alpha-Chlordane	2.40	2.00	120	74-130
cis-Nonachlor	2.04	2.00	102	69-134
Dieldrin	1.48	2.00	74	62-131
gamma-BHC (Lindane)	1.83	2.00	92	79-116
gamma-Chlordane	2.22	2.00	111	76-128
Heptachlor	1.97	2.00	99	81-114
Oxychlordane	1.96	2.00	98	59-141
trans-Nonachlor	2.09	2.00	105	76-124

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703
Date Analyzed: 09/24/18
Date Extracted: 09/14/18

Duplicate Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3535A

Units: ng/L
Basis: NA
Analysis Lot: 608199

Lab Control Sample
KQ1812810-01

Duplicate Lab Control Sample
KQ1812810-02

Analyte Name	Lab Control Sample KQ1812810-01			Duplicate Lab Control Sample KQ1812810-02			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,4'-DDD	19.7	20.0	98	18.2	20.0	91	79-113	8	30
2,4'-DDE	18.3	20.0	92	17.7	20.0	88	75-117	4	30
2,4'-DDT	18.2	20.0	91	20.3	20.0	101	77-114	11	30
4,4'-DDD	21.6	20.0	108	19.9	20.0	100	78-114	8	30
4,4'-DDE	17.3	20.0	87	16.5	20.0	82	76-115	5	30
4,4'-DDT	19.7	20.0	98	21.8	20.0	109	85-113	10	30
Aldrin	18.8	20.0	94	19.0	20.0	95	81-113	<1	30
alpha-Chlordane	22.4	20.0	112	22.1	20.0	110	69-130	1	30
cis-Nonachlor	21.4	20.0	107	22.4	20.0	112	59-138	5	30
Dieldrin	16.2	20.0	81	15.8	20.0	79	62-111	3	30
gamma-BHC (Lindane)	20.0	20.0	100	19.3	20.0	96	66-130	4	30
gamma-Chlordane	22.4	20.0	112	22.2	20.0	111	72-127	<1	30
Heptachlor	22.2	20.0	111	20.3	20.0	102	81-115	9	30
Oxychlordane	21.1	20.0	106	20.5	20.0	102	77-123	3	30
trans-Nonachlor	21.6	20.0	108	21.0	20.0	105	72-127	2	30

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703
Date Analyzed: 09/24/18 18:05
Date Extracted: 09/14/18

Method Blank Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: Method Blank **Instrument ID:** K-MS-42
Lab Code: KQ1812810-03 **File ID:** Y:\MS42\data\092418\092418F018.D
Analysis Method: ALS SOP **Analysis Lot:** 608199
Prep Method: EPA 3535A **Extraction Lot:** 321892

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1812810-01	Y:\MS42\data\092418\092418F019.D	09/24/18 18:22
Duplicate Lab Control Sample	KQ1812810-02	Y:\MS42\data\092418\092418F020.D	09/24/18 18:40
PDI-RB-VV-090718	K1808703-003	Y:\MS42\data\092418\092418F021.D	09/24/18 18:57

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Analyzed: 10/16/18 21:36
Date Extracted: 10/05/18

Method Blank Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: Method Blank **Instrument ID:** K-MS-42
Lab Code: KQ1814154-04 **File ID:** Y:\MS42\data\101618\101618F026.D
Analysis Method: ALS SOP **Analysis Lot:** 611291
Prep Method: EPA 3541 **Extraction Lot:** 323457

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1814154-03	Y:\MS42\data\101618\101618F027.D	10/16/18 21:53
PDI-SG-B479MS	KQ1814154-01	Y:\MS42\data\101618\101618F028.D	10/16/18 22:11
PDI-SG-B479DMS	KQ1814154-02	Y:\MS42\data\101618\101618F029.D	10/16/18 22:29
PDI-SG-B479	K1808703-002	Y:\MS42\data\101618\101618F030.D	10/16/18 22:46

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Analyzed: 10/24/18 14:49
Date Extracted: 10/11/18

Method Blank Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: Method Blank **Instrument ID:** K-MS-42
Lab Code: KQ1814562-04 **File ID:** Y:\MS42\data\102418\102418F005.D
Analysis Method: ALS SOP **Analysis Lot:** 612484,612678
Prep Method: EPA 3541 **Extraction Lot:** 323933

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1814562-03	Y:\MS42\data\102418\102418F006.D	10/24/18 15:07
Batch QCMS	KQ1814562-01	Y:\MS42\data\102418\102418F007.D	10/24/18 15:24
Batch QCDMS	KQ1814562-02	Y:\MS42\data\102418\102418F008.D	10/24/18 15:42
Batch QC	K1809944-011	Y:\MS42\data\102418\102418F015.D	10/24/18 17:45
PDI-SG-B431	K1808703-001	Y:\MS42\data\102518\102518F007.D	10/25/18 15:15

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703
Date Analyzed: 09/24/18 18:22
Date Extracted: 09/14/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: Lab Control Sample **Instrument ID:** K-MS-42
Lab Code: KQ1812810-01 **File ID:** Y:\MS42\data\092418\092418F019.D
Analysis Method: ALS SOP **Analysis Lot:** 608199
Prep Method: EPA 3535A **Extraction Lot:** 321892

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1812810-03	Y:\MS42\data\092418\092418F018.D	09/24/18 18:05
Duplicate Lab Control Sample	KQ1812810-02	Y:\MS42\data\092418\092418F020.D	09/24/18 18:40
PDI-RB-VV-090718	K1808703-003	Y:\MS42\data\092418\092418F021.D	09/24/18 18:57

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Analyzed: 10/16/18 21:53
Date Extracted: 10/05/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: Lab Control Sample **Instrument ID:** K-MS-42
Lab Code: KQ1814154-03 **File ID:** Y:\MS42\data\101618\101618F027.D
Analysis Method: ALS SOP **Analysis Lot:** 611291
Prep Method: EPA 3541 **Extraction Lot:** 323457

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1814154-04	Y:\MS42\data\101618\101618F026.D	10/16/18 21:36
PDI-SG-B479MS	KQ1814154-01	Y:\MS42\data\101618\101618F028.D	10/16/18 22:11
PDI-SG-B479DMS	KQ1814154-02	Y:\MS42\data\101618\101618F029.D	10/16/18 22:29
PDI-SG-B479	K1808703-002	Y:\MS42\data\101618\101618F030.D	10/16/18 22:46

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request: K1808703
Date Analyzed: 10/24/18 15:07
Date Extracted: 10/11/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name: Lab Control Sample **Instrument ID:** K-MS-42
Lab Code: KQ1814562-03 **File ID:** Y:\MS42\data\102418\102418F006.D
Analysis Method: ALS SOP **Analysis Lot:** 612484,612678
Prep Method: EPA 3541 **Extraction Lot:** 323933

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1814562-04	Y:\MS42\data\102418\102418F005.D	10/24/18 14:49
Batch QCMS	KQ1814562-01	Y:\MS42\data\102418\102418F007.D	10/24/18 15:24
Batch QCDMS	KQ1814562-02	Y:\MS42\data\102418\102418F008.D	10/24/18 15:42
Batch QC	K1809944-011	Y:\MS42\data\102418\102418F015.D	10/24/18 17:45
PDI-SG-B431	K1808703-001	Y:\MS42\data\102518\102518F007.D	10/25/18 15:15

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QC/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 09/24/18 18:05

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\092418\092418F018.D
Instrument ID: K-MS-42

Analytical Method: ALS SOP
Analysis Lot: 608199

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Method Blank	KQ1812810-03	Y:\MS42\data\092418\092418F018.D	09/24/18 18:05	
Lab Control Sample	KQ1812810-01	Y:\MS42\data\092418\092418F019.D	09/24/18 18:22	
Duplicate Lab Control Sample	KQ1812810-02	Y:\MS42\data\092418\092418F020.D	09/24/18 18:40	
PDI-RB-VV-090718	K1808703-003	Y:\MS42\data\092418\092418F021.D	09/24/18 18:57	

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QC/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 10/16/18 19:15

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\101618\101618F018.D
Instrument ID: K-MS-42

Analytical Method: ALS SOP
Analysis Lot: 611291

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1814940-01	Y:\MS42\data\101618\101618F018.D	10/16/18 19:15	
Method Blank	KQ1814154-04	Y:\MS42\data\101618\101618F026.D	10/16/18 21:36	
Lab Control Sample	KQ1814154-03	Y:\MS42\data\101618\101618F027.D	10/16/18 21:53	
PDI-SG-B479	KQ1814154-01	Y:\MS42\data\101618\101618F028.D	10/16/18 22:11	
PDI-SG-B479	KQ1814154-02	Y:\MS42\data\101618\101618F029.D	10/16/18 22:29	
PDI-SG-B479	K1808703-002	Y:\MS42\data\101618\101618F030.D	10/16/18 22:46	

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QC/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 10/24/18 14:31

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\102418\102418F004.D
Instrument ID: K-MS-42

Analytical Method: ALS SOP
Analysis Lot: 612484

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1815515-01	Y:\MS42\data\102418\102418F004.D	10/24/18 14:31	
Method Blank	KQ1814562-04	Y:\MS42\data\102418\102418F005.D	10/24/18 14:49	
Lab Control Sample	KQ1814562-03	Y:\MS42\data\102418\102418F006.D	10/24/18 15:07	
Batch QC	KQ1814562-01	Y:\MS42\data\102418\102418F007.D	10/24/18 15:24	
Batch QC	KQ1814562-02	Y:\MS42\data\102418\102418F008.D	10/24/18 15:42	
Batch QC	K1809944-011	Y:\MS42\data\102418\102418F015.D	10/24/18 17:45	

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QC/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 10/25/18 14:01

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\102518\102518F004.D
Instrument ID: K-MS-42

Analytical Method: ALS SOP
Analysis Lot: 612678

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1815597-02	Y:\MS42\data\102518\102518F004.D	10/25/18 14:01	
PDI-SG-B431	K1808703-001	Y:\MS42\data\102518\102518F007.D	10/25/18 15:15	

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 10/16/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800476
Instrument ID: K-MS-42

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800476-01	OC PEST ICAL 0.5ng/mL SVM59-48A	Y:\MS42\data\101618\101618F008.D	10/16/2018 16:19
02	KC1800476-02	OC PEST ICAL 1ng/mL SVM59-48B	Y:\MS42\data\101618\101618F009.D	10/16/2018 16:36
03	KC1800476-03	OC PEST ICAL 2ng/mL SVM59-48C	Y:\MS42\data\101618\101618F010.D	10/16/2018 16:54
04	KC1800476-04	OC PEST ICAL 5ng/mL SVM59-48D	Y:\MS42\data\101618\101618F011.D	10/16/2018 17:12
05	KC1800476-05	OC PEST ICAL 10ng/mL SVM59-48E	Y:\MS42\data\101618\101618F012.D	10/16/2018 17:29
06	KC1800476-06	OC PEST ICAL 20ng/mL SVM59-48F	Y:\MS42\data\101618\101618F013.D	10/16/2018 17:47
07	KC1800476-07	OC PEST ICAL 40ng/mL SVM59-48G	Y:\MS42\data\101618\101618F014.D	10/16/2018 18:04
08	KC1800476-08	OC PEST ICAL 60ng/mL SVM59-48H	Y:\MS42\data\101618\101618F015.D	10/16/2018 18:22
09	KC1800476-09	OC PEST ICAL 80ng/mL SVM59-48I	Y:\MS42\data\101618\101618F016.D	10/16/2018 18:40
10	KC1800476-10	OC PEST ICAL 100ng/mL SVM59-48J	Y:\MS42\data\101618\101618F017.D	10/16/2018 18:57

Analyte

2,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.408	02	1	1.486	03	2	1.393	04	5	1.148
05	10	0.9229	06	20	1.044	07	40	1.008	08	60	1.288
09	80	1.128	10	100	1.126						

2,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.036	02	1	0.9891	03	2	1.087	04	5	0.8842
05	10	0.9317	06	20	1.029	07	40	1.022	08	60	0.9559
09	80	0.8655	10	100	0.8687						

2,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.545	02	1	2.181	03	2	2.251	04	5	2.206
05	10	2.233	06	20	2.283	07	40	2.252	08	60	2.32
09	80	2.499	10	100	2.355						

4,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.682	02	1	1.556	03	2	1.504	04	5	1.466
05	10	1.402	06	20	1.59	07	40	1.477	08	60	1.578
09	80	1.429	10	100	1.446						

4,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.306	02	1	1.162	03	2	1.228	04	5	0.9593
05	10	0.8031	06	20	0.8555	07	40	0.8511	08	60	1.046
09	80	0.8879	10	100	0.8677						

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 10/16/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800476
Instrument ID: K-MS-42

Signal ID: 1

Analyte

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.224	02	1	1.125	03	2	1.124	04	5	1.115
05	10	1.115	06	20	1.1	07	40	1.031	08	60	1.067
09	80	1.137	10	100	1.159						

Aldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.09	02	1	2.409	03	2	1.455	04	5	0.8914
05	10	0.7729	06	20	0.7424	07	40	0.6798	08	60	0.6289
09	80	0.6249	10	100	0.6366						

Dieldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.538	02	1	1.757	03	2	1.696	04	5	1.476
05	10	1.373	06	20	1.393	07	40	1.59	08	60	1.852
09	80	1.78	10	100	1.862						

Heptachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.245	02	1	1.106	03	2	1.202	04	5	1.097
05	10	1.118	06	20	1.088	07	40	1.08	08	60	1.105
09	80	1.057	10	100	0.976						

Oxychlorane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.981	02	1	2.837	03	2	2.897	04	5	2.683
05	10	2.602	06	20	2.777	07	40	2.569	08	60	2.612
09	80	2.614	10	100	2.42						

S_4,4'-DDT-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	1.593	02	5	1.66	03	5	1.714	04	5	1.676
05	5	1.634	06	5	1.658	07	5	1.735	08	5	1.775
09	5	1.807	10	5	1.803						

S_4,4'DDD-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	3.202	02	5	3.227	03	5	3.695	04	5	3.237
05	5	3.262	06	5	2.832	07	5	3.267	08	5	3.482
09	5	3.996	10	5	4.023						

S_Aldrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.5276	02	20	0.5221	03	20	0.6648	04	20	0.4651
05	20	0.508	06	20	0.476	07	20	0.5362	08	20	0.5574
09	20	0.516	10	20	0.5198						

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 10/16/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800476
Instrument ID: K-MS-42

Signal ID: 1

Analyte

S_Endrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.173	02	20	0.1519	03	20	0.1811	04	20	0.159
05	20	0.1529	06	20	0.1477	07	20	0.1536	08	20	0.1655
09	20	0.1708	10	20	0.1678						

S_GBHCD6

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	1.631	02	20	1.271	03	20	1.716	04	20	1.386
05	20	1.472	06	20	1.526	07	20	1.731	08	20	1.479
09	20	1.505	10	20	1.464						

S_Heptachlor-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.5789	02	20	0.5263	03	20	0.5551	04	20	0.5908
05	20	0.6355	06	20	0.6391	07	20	0.6795	08	20	0.6186
09	20	0.6452	10	20	0.626						

S_Heptachlrepx13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1657	02	20	0.1641	03	20	0.19	04	20	0.1504
05	20	0.1705	06	20	0.1634	07	20	0.1928	08	20	0.1914
09	20	0.1781	10	20	0.1924						

S_Oxychlorane-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.3767	02	20	0.3563	03	20	0.4321	04	20	0.3441
05	20	0.3929	06	20	0.3651	07	20	0.4343	08	20	0.4107
09	20	0.3915	10	20	0.4249						

alpha-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.06	02	1	1.815	03	2	1.847	04	5	1.785
05	10	1.787	06	20	1.892	07	40	1.855	08	60	1.902
09	80	1.89	10	100	1.727						

cis-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.6709	02	1	0.6127	03	2	0.569	04	5	0.5738
05	10	0.5618	06	20	0.639	07	40	0.5998	08	60	0.6296
09	80	0.6394	10	100	0.5818						

gamma-BHC (Lindane)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.407	02	1	2.512	03	2	2.178	04	5	2.121
05	10	2.284	06	20	2.246	07	40	2.186	08	60	2.305
09	80	2.186	10	100	2.204						

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 10/16/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800476
Instrument ID: K-MS-42

Signal ID: 1

Analyte

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.792	02	1	1.567	03	2	1.509	04	5	1.482
05	10	1.488	06	20	1.618	07	40	1.57	08	60	1.521
09	80	1.509	10	100	1.449						

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 10/16/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800476
Instrument ID: K-MS-42

Signal ID: 1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
2,4'-DDD	TRG	Average RF	% RSD	15.8	20	1.195	0.01
2,4'-DDE	TRG	Average RF	% RSD	8.1	20	0.9669	0.01
2,4'-DDT	TRG	Average RF	% RSD	5.3	20	2.312	0.01
4,4'-DDD	TRG	Average RF	% RSD	5.7	20	1.513	0.01
4,4'-DDE	TRG	Average RF	% RSD	17.9	20	0.9967	0.01
4,4'-DDT	TRG	Average RF	% RSD	4.6	20	1.12	0.01
Aldrin	TRG	Quadratic	COD	0.9991		1.293	0.01
Dieldrin	TRG	Average RF	% RSD	11.2	20	1.632	0.01
Heptachlor	TRG	Average RF	% RSD	6.7	20	1.107	0.01
Oxychlordane	TRG	Average RF	% RSD	6.3	20	2.699	0.01
S_4,4'-DDT-d4	SURR	Average RF	% RSD	4.3		1.705	0.01
S_4,4'DDD-d4	SURR	Average RF	% RSD	11.1		3.422	0.01
S_Aldrin-13C12	SURR	Average RF	% RSD	10.3		0.5293	0.01
S_Endrin-13C12	SURR	Average RF	% RSD	6.7		0.1623	0.01
S_GBHCD6	SURR	Average RF	% RSD	9.4		1.518	0.01
S_Heptachlor-13C10	SURR	Average RF	% RSD	7.6		0.6095	0.01
S_Heptachlrepx13C10	SURR	Average RF	% RSD	8.6		0.1759	0.01
S_Oxychlordane-13C10	SURR	Average RF	% RSD	8.2		0.3929	0.01
alpha-Chlordane	TRG	Average RF	% RSD	4.9	20	1.856	0.01
cis-Nonachlor	TRG	Average RF	% RSD	6.0	20	0.6078	0.01
gamma-BHC (Lindane)	TRG	Average RF	% RSD	5.3	20	2.263	0.01
trans-Nonachlor	TRG	Average RF	% RSD	6.3	20	1.551	0.01

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 9/24/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800454
Instrument ID: K-MS-42

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800454-01	OC PEST ICAL 0.5ng/mL SVM59-48A	092418F004.D	09/24/2018 13:58
02	KC1800454-02	OC PEST ICAL 1ng/mL SVM59-48B	092418F005.D	09/24/2018 14:16
03	KC1800454-03	OC PEST ICAL 2ng/mL SVM59-48C	092418F006.D	09/24/2018 14:33
04	KC1800454-04	OC PEST ICAL 5ng/mL SVM59-48D	092418F007.D	09/24/2018 14:51
05	KC1800454-05	OC PEST ICAL 10ng/mL SVM59-48E	092418F008.D	09/24/2018 15:08
06	KC1800454-06	OC PEST ICAL 20ng/mL SVM59-48F	092418F009.D	09/24/2018 15:26
07	KC1800454-07	OC PEST ICAL 40ng/mL SVM59-48G	092418F010.D	09/24/2018 15:44
08	KC1800454-08	OC PEST ICAL 60ng/mL SVM59-48H	092418F011.D	09/24/2018 16:01
09	KC1800454-09	OC PEST ICAL 80ng/mL SVM59-48I	092418F012.D	09/24/2018 16:19
10	KC1800454-10	OC PEST ICAL 100ng/mL SVM59-48J	092418F013.D	09/24/2018 16:36

Analyte

2,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.13	02	1	1.262	03	2	0.8977	04	5	0.9309
05	10	0.9372	06	20	0.954	07	40	0.9157	08	60	0.9512
09	80	0.884	10	100	0.9403						

2,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.8398	02	1	0.9221	03	2	0.9065	04	5	0.858
05	10	0.8604	06	20	0.9081	07	40	0.8657	08	60	0.8632
09	80	0.8539	10	100	0.9442						

2,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.483	02	1	2.285	03	2	2.246	04	5	2.174
05	10	2.168	06	20	2.268	07	40	2.273	08	60	2.425
09	80	2.523	10	100	2.556						

4,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.678	02	1	1.656	03	2	1.603	04	5	1.572
05	10	1.68	06	20	1.708	07	40	1.55	08	60	1.618
09	80	1.625	10	100	1.598						

4,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.9864	02	1	1.05	03	2	0.7135	04	5	0.7555
05	10	0.7185	06	20	0.721	07	40	0.722	08	60	0.8393
09	80	0.7276	10	100	0.7194						

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 9/24/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800454
Instrument ID: K-MS-42

Signal ID: 1

Analyte

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.164	02	1	1.109	03	2	1.122	04	5	1.012
05	10	0.9998	06	20	0.9864	07	40	1.011	08	60	1.108
09	80	1.163	10	100	1.106						

Aldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.454	02	1	2.615	03	2	1.534	04	5	1.007
05	10	0.7659	06	20	0.7848	07	40	0.6859	08	60	0.6789
09	80	0.6699	10	100	0.6477						

Dieldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.623	02	1	1.558	03	2	1.546	04	5	1.572
05	10	1.641	06	20	1.937	07	40	1.925	08	60	2.106
09	80	2.146									

Heptachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.245	02	1	1.174	03	2	1.098	04	5	1.083
05	10	1.111	06	20	1.098	07	40	1.065	08	60	1.066
09	80	0.9935	10	100	1.028						

Oxychlorane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	3.028	02	1	2.691	03	2	2.822	04	5	2.75
05	10	2.658	06	20	2.82	07	40	2.412	08	60	2.74
09	80	2.62	10	100	2.689						

S_4,4'-DDT-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	1.714	02	5	1.75	03	5	1.666	04	5	1.666
05	5	1.706	06	5	1.669	07	5	1.893	08	5	1.784
09	5	1.748	10	5	1.783						

S_4,4'DDD-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	3.438	02	5	3.502	03	5	3.387	04	5	3.216
05	5	3.208	06	5	3.3	07	5	3.7	08	5	3.81
09	5	3.928	10	5	4.3						

S_Aldrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.4217	02	20	0.5003	03	20	0.4909	04	20	0.4611
05	20	0.4841	06	20	0.4484	07	20	0.5389	08	20	0.5041
09	20	0.496	10	20	0.6354						

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 9/24/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800454
Instrument ID: K-MS-42

Signal ID: 1

Analyte

S_Endrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1564	02	20	0.1607	03	20	0.1389	04	20	0.1286
05	20	0.1301	06	20	0.1189	07	20	0.1315	08	20	0.128
09	20	0.1267	10	20	0.126						

S_GBHCD6

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	1.425	02	20	1.53	03	20	1.57	04	20	1.576
05	20	1.507	06	20	1.578	07	20	1.652	08	20	1.622
09	20	1.546	10	20	2.199						

S_Heptachlor-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.6602	02	20	0.7072	03	20	0.7263	04	20	0.6757
05	20	0.7016	06	20	0.7092	07	20	0.757	08	20	0.7615
09	20	0.7522	10	20	0.8358						

S_Heptachlrepx13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1586	02	20	0.1662	03	20	0.1649	04	20	0.1579
05	20	0.1711	06	20	0.1678	07	20	0.1898	08	20	0.1853
09	20	0.1832	10	20	0.2239						

S_Oxychlorane-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.3501	02	20	0.3758	03	20	0.3922	04	20	0.3653
05	20	0.3875	06	20	0.3753	07	20	0.4756	08	20	0.4372
09	20	0.4222	10	20	0.5398						

alpha-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.364	02	1	2.26	03	2	2.116	04	5	2.221
05	10	2.254	06	20	2.281	07	40	2.055	08	60	2.203
09	80	2.201	10	100	2.271						

cis-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.6186	02	1	0.5807	03	2	0.5603	04	5	0.5965
05	10	0.5713	06	20	0.6391	07	40	0.5527	08	60	0.6316
09	80	0.6392	10	100	0.5954						

gamma-BHC (Lindane)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.358	02	1	2.156	03	2	2.239	04	5	2.096
05	10	2.143	06	20	2.177	07	40	2.278	08	60	2.29
09	80	2.419	10	100	2.099						

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 9/24/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800454
Instrument ID: K-MS-42

Signal ID: 1

Analyte

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.615	02	1	1.46	03	2	1.427	04	5	1.459
05	10	1.494	06	20	1.696	07	40	1.396	08	60	1.499
09	80	1.668	10	100	1.555						

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 9/24/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800454
Instrument ID: K-MS-42

Signal ID: 1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
2,4'-DDD	TRG	Average RF	% RSD	12.2	20	0.9803	0.01
2,4'-DDE	TRG	Average RF	% RSD	4.0	20	0.8822	0.01
2,4'-DDT	TRG	Average RF	% RSD	6.1	20	2.34	0.01
4,4'-DDD	TRG	Average RF	% RSD	3.1	20	1.629	0.01
4,4'-DDE	TRG	Average RF	% RSD	15.6	20	0.7954	0.01
4,4'-DDT	TRG	Average RF	% RSD	6.4	20	1.078	0.01
Aldrin	TRG	Quadratic	COD	0.9995		1.384	0.01
Dieldrin	TRG	Average RF	% RSD	13.7	20	1.784	0.01
Heptachlor	TRG	Average RF	% RSD	6.5	20	1.096	0.01
Oxychlorane	TRG	Average RF	% RSD	5.8	20	2.723	0.01
S_4,4'-DDT-d4	SURR	Average RF	% RSD	4.1		1.738	0.01
S_4,4'DDD-d4	SURR	Average RF	% RSD	9.9		3.579	0.01
S_Aldrin-13C12	SURR	Average RF	% RSD	11.7		0.4981	0.01
S_Endrin-13C12	SURR	Average RF	% RSD	10.1		0.1346	0.01
S_GBHCD6	SURR	Average RF	% RSD	13.1		1.621	0.01
S_Heptachlor-13C10	SURR	Average RF	% RSD	6.9		0.7287	0.01
S_Heptachlrepx13C10	SURR	Average RF	% RSD	11.2		0.1769	0.01
S_Oxychlorane-13C10	SURR	Average RF	% RSD	14.2		0.4121	0.01
alpha-Chlordane	TRG	Average RF	% RSD	3.9	20	2.222	0.01
cis-Nonachlor	TRG	Average RF	% RSD	5.4	20	0.5985	0.01
gamma-BHC (Lindane)	TRG	Average RF	% RSD	4.9	20	2.225	0.01
trans-Nonachlor	TRG	Average RF	% RSD	6.7	20	1.527	0.01

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 10/16/2018

Initial Calibration Verification Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800476
Instrument ID: K-MS-42

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800476-11	OC PEST ICV 20ng/mL SVM59-48K	Y:\MS42\data\101618\101618F018.D	10/16/2018 19:15

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4'-DDD	20.0	22.3	1.195E0	1.335E0	11.71	±25	Average RF
2,4'-DDE	20.0	21.2	9.669E-1	1.027E0	6.17	±25	Average RF
2,4'-DDT	20.0	19.2	2.312E0	2.214E0	-4.248	±25	Average RF
4,4'-DDD	20.0	20.2	1.513E0	1.528E0	1.03	±25	Average RF
4,4'-DDE	20.0	21.3	9.967E-1	1.064E0	6.75	±25	Average RF
4,4'-DDT	20.0	19.9	1.12E0	1.112E0	-0.645	±25	Average RF
Aldrin	20.0	20.8	1.293E0	7.308E-1	4.06	±25	Quadratic
alpha-Chlordane	20.0	20.4	1.856E0	1.892E0	1.96	±25	Average RF
cis-Nonachlor	20.0	18.0	6.078E-1	5.485E-1	-9.754	±25	Average RF
Dieldrin	20.0	21.9	1.632E0	1.783E0	9.28	±25	Average RF
gamma-BHC (Lindane)	20.0	19.4	2.263E0	2.195E0	-3.006	±25	Average RF
Heptachlor	20.0	19.9	1.107E0	1.104E0	-0.320	±25	Average RF
Oxychlordane	20.0	21.0	2.699E0	2.836E0	5.06	±25	Average RF
trans-Nonachlor	20.0	19.3	1.551E0	1.497E0	-3.436	±25	Average RF

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.54	3.422E0	3.789E0	111	50-200	Average RF
S_4,4'-DDT-d4	5.00	4.85	1.705E0	1.653E0	97.0	50-200	Average RF
S_Aldrin-13C12	20.0	23.9	5.293E-1	6.331E-1	120	50-200	Average RF
S_Endrin-13C12	20.0	21.4	1.623E-1	1.734E-1	107	50-200	Average RF
S_GBHCD6	20.0	23.2	1.518E0	1.763E0	116	50-200	Average RF
S_Heptachlor-13C10	20.0	19.0	6.095E-1	5.778E-1	95.0	50-200	Average RF
S_Heptachlrepx13C10	20.0	25.0	1.759E-1	2.198E-1	125	50-200	Average RF
S_Oxychlordane-13C10	20.0	23.0	3.929E-1	4.515E-1	115	50-200	Average RF

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1808703
Calibration Date: 9/24/2018

**Initial Calibration Verification Summary
Organochlorine Pesticides by GC/MS/MS**

Calibration ID: KC1800454
Instrument ID: K-MS-42

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800454-11	OC PEST ICV 20ng/mL SVM59-48K	092418F014.D	09/24/2018 16:54

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4'-DDD	20.0	20.6	9.803E-1	1.01E0	3.06	±25	Average RF
2,4'-DDE	20.0	22.5	8.822E-1	9.926E-1	12.51	±25	Average RF
2,4'-DDT	20.0	19.9	2.34E0	2.328E0	-0.518	±25	Average RF
4,4'-DDD	20.0	20.9	1.629E0	1.702E0	4.49	±25	Average RF
4,4'-DDE	20.0	21.3	7.954E-1	8.479E-1	6.60	±25	Average RF
4,4'-DDT	20.0	20.9	1.078E0	1.129E0	4.68	±25	Average RF
Aldrin	20.0	17.5	1.384E0	6.616E-1	-12.548	±25	Quadratic
alpha-Chlordane	20.0	20.5	2.222E0	2.273E0	2.26	±25	Average RF
cis-Nonachlor	20.0	20.5	5.985E-1	6.129E-1	2.40	±25	Average RF
Dieldrin	20.0	22.3	1.784E0	1.992E0	11.65	±25	Average RF
gamma-BHC (Lindane)	20.0	21.1	2.225E0	2.347E0	5.44	±25	Average RF
Heptachlor	20.0	22.1	1.096E0	1.212E0	10.60	±25	Average RF
Oxychlordane	20.0	22.0	2.723E0	2.994E0	9.95	±25	Average RF
trans-Nonachlor	20.0	20.1	1.527E0	1.536E0	0.615	±25	Average RF

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	4.49	3.579E0	3.216E0	89.8	50-200	Average RF
S_4,4'-DDT-d4	5.00	4.53	1.738E0	1.574E0	90.6	50-200	Average RF
S_Aldrin-13C12	20.0	21.2	4.981E-1	5.292E-1	106	50-200	Average RF
S_Endrin-13C12	20.0	16.7	1.346E-1	1.121E-1	83.5	50-200	Average RF
S_GBHCD6	20.0	20.0	1.621E0	1.62E0	100	50-200	Average RF
S_Heptachlor-13C10	20.0	18.1	7.287E-1	6.582E-1	90.5	50-200	Average RF
S_Heptachlrepx13C10	20.0	19.3	1.769E-1	1.711E-1	96.5	50-200	Average RF
S_Oxychlordane-13C10	20.0	20.1	4.121E-1	4.141E-1	101	50-200	Average RF

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 10/16/18 19:15

**Continuing Calibration Verification (CCV) Summary
Organochlorine Pesticides by GC/MS/MS**

Analysis Method: ALS SOP
File ID: Y:\MS42\data\101618\101618F018.D
Signal ID: 1

Calibration Date: 10/16/2018
Calibration ID: KC1800476
Analysis Lot: 611291
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	22.3	1.1952	1.3351	11.7	NA	±25	Average RF
2,4'-DDE	20.0	21.2	0.9669	1.0265	6.2	NA	±25	Average RF
2,4'-DDT	20.0	19.2	2.3125	2.2142	-4.2	NA	±25	Average RF
4,4'-DDD	20.0	20.2	1.5128	1.5284	1.0	NA	±25	Average RF
4,4'-DDE	20.0	21.3	0.9967	1.064	6.7	NA	±25	Average RF
4,4'-DDT	20.0	19.9	1.1197	1.1124	-0.6	NA	±25	Average RF
Aldrin	20.0	20.8	1.2931	0.7308	NA	4.1	±25	Quadratic
alpha-Chlordane	20.0	20.4	1.856	1.8923	2.0	NA	±25	Average RF
cis-Nonachlor	20.0	18.0	0.6078	0.5485	-9.8	NA	±25	Average RF
Dieldrin	20.0	22.2	1.6318	1.7832	9.3	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	19.4	2.263	2.195	-3.0	NA	±25	Average RF
gamma-Chlordane	20.0	21.5	NA	NA	NA	NA	±25	
Heptachlor	20.0	19.9	1.1074	1.1038	-0.3	NA	±25	Average RF
Oxychlordane	20.0	21.0	2.6993	2.8357	5.1	NA	±25	Average RF
trans-Nonachlor	20.0	19.3	1.5507	1.4974	-3.4	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.54	3.4222	3.7887	111	NA	50-200	Average RF
S_4,4'-DDT-d4	5.00	4.85	1.7055	1.6529	96.9	NA	50-200	Average RF
S_Aldrin-13C12	20.0	23.9	0.5293	0.6331	120	NA	50-200	Average RF
S_Endrin-13C12	20.0	21.4	0.1623	0.1734	107	NA	50-200	Average RF
S_GBHCD6	20.0	23.2	1.518	1.7629	116	NA	50-200	Average RF
S_Heptachlor-13C10	20.0	19.0	0.6095	0.5778	94.8	NA	50-200	Average RF
S_Heptachlrepx13C10	20.0	25.0	0.1759	0.2198	125	NA	50-200	Average RF
S_Oxychlordane-13C10	20.0	23.0	0.3929	0.4515	115	NA	50-200	Average RF

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 10/24/18 14:31

**Continuing Calibration Verification (CCV) Summary
Organochlorine Pesticides by GC/MS/MS**

Analysis Method: ALS SOP
File ID: Y:\MS42\data\102418\102418F004.D
Signal ID: 1

Calibration Date: 10/16/2018
Calibration ID: KC1800476
Analysis Lot: 612484
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	13.9	1.1952	0.8317	-30.4*	NA	±25	Average RF
2,4'-DDE	20.0	16.3	0.9669	0.7904	-18.3	NA	±25	Average RF
2,4'-DDT	20.0	15.7	2.3125	1.8116	-21.7	NA	±25	Average RF
4,4'-DDD	20.0	21.1	1.5128	1.5968	5.6	NA	±25	Average RF
4,4'-DDE	20.0	12.4	0.9967	0.6194	-37.9*	NA	±25	Average RF
4,4'-DDT	20.0	18.5	1.1197	1.0383	-7.3	NA	±25	Average RF
Aldrin	20.0	19.2	1.2931	0.6808	NA	-4.1	±25	Quadratic
alpha-Chlordane	20.0	25.1	1.856	2.3257	25.3	NA	±25	Average RF
cis-Nonachlor	20.0	19.8	0.6078	0.6025	-0.9	NA	±25	Average RF
Dieldrin	20.0	14.3	1.6318	1.1473	-29.7*	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	19.1	2.263	2.1627	-4.4	NA	±25	Average RF
gamma-Chlordane	20.0	20.5	NA	NA	NA	NA	±25	
Heptachlor	20.0	21.3	1.1074	1.1781	6.4	NA	±25	Average RF
Oxychlordane	20.0	19.9	2.6993	2.6905	-0.3	NA	±25	Average RF
trans-Nonachlor	20.0	18.9	1.5507	1.4634	-5.6	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.22	3.4222	3.5741	104	NA	50-200	Average RF
S_4,4'-DDT-d4	5.00	6.46	1.7055	2.2031	129	NA	50-200	Average RF
S_Aldrin-13C12	20.0	16.2	0.5293	0.428	80.9	NA	50-200	Average RF
S_Endrin-13C12	20.0	22.8	0.1623	0.185	114	NA	50-200	Average RF
S_GBHCD6	20.0	15.3	1.518	1.1591	76.4	NA	50-200	Average RF
S_Heptachlor-13C10	20.0	20.4	0.6095	0.6214	102	NA	50-200	Average RF
S_Heptachlrepx13C10	20.0	15.8	0.1759	0.1393	79.2	NA	50-200	Average RF
S_Oxychlordane-13C10	20.0	15.9	0.3929	0.3129	79.6	NA	50-200	Average RF

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703
Date Analyzed: 10/25/18 14:01

**Continuing Calibration Verification (CCV) Summary
Organochlorine Pesticides by GC/MS/MS**

Analysis Method: ALS SOP
File ID: Y:\MS42\data\102518\102518F004.D
Signal ID: 1

Calibration Date: 10/16/2018
Calibration ID: KC1800476
Analysis Lot: 612678
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	15.4	1.1952	0.9202	-23.0	NA	±25	Average RF
2,4'-DDE	20.0	17.2	0.9669	0.83	-14.2	NA	±25	Average RF
2,4'-DDT	20.0	17.4	2.3125	2.0062	-13.2	NA	±25	Average RF
4,4'-DDD	20.0	22.1	1.5128	1.6715	10.5	NA	±25	Average RF
4,4'-DDE	20.0	12.1	0.9967	0.6031	-39.5*	NA	±25	Average RF
4,4'-DDT	20.0	19.0	1.1197	1.0617	-5.2	NA	±25	Average RF
Aldrin	20.0	19.6	1.2931	0.6944	NA	-1.8	±25	Quadratic
alpha-Chlordane	20.0	25.0	1.856	2.3187	24.9	NA	±25	Average RF
cis-Nonachlor	20.0	20.0	0.6078	0.6079	0.0	NA	±25	Average RF
Dieldrin	20.0	16.0	1.6318	1.2859	-21.2	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	18.4	2.263	2.0794	-8.1	NA	±25	Average RF
gamma-Chlordane	20.0	21.2	NA	NA	NA	NA	±25	
Heptachlor	20.0	20.2	1.1074	1.1173	0.9	NA	±25	Average RF
Oxychlordane	20.0	20.1	2.6993	2.7115	0.5	NA	±25	Average RF
trans-Nonachlor	20.0	19.1	1.5507	1.4818	-4.4	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.51	3.4222	3.7745	110	NA	50-200	Average RF
S_4,4'-DDT-d4	5.00	6.41	1.7055	2.1876	128	NA	50-200	Average RF
S_Aldrin-13C12	20.0	17.8	0.5293	0.4712	89.0	NA	50-200	Average RF
S_Endrin-13C12	20.0	21.8	0.1623	0.1768	109	NA	50-200	Average RF
S_GBHCD6	20.0	18.3	1.518	1.3904	91.6	NA	50-200	Average RF
S_Heptachlor-13C10	20.0	22.2	0.6095	0.676	111	NA	50-200	Average RF
S_Heptachlrepx13C10	20.0	19.0	0.1759	0.1671	95.0	NA	50-200	Average RF
S_Oxychlordane-13C10	20.0	18.3	0.3929	0.3594	91.5	NA	50-200	Average RF

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method:

Analysis Lot: 608199

Instrument ID: K-MS-42

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
Y:\MS42\data\092418\092418F014.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	16:54	
Y:\MS42\data\092418\092418F018.D	Method Blank	KQ1812810-03	9/24/2018	18:05	
Y:\MS42\data\092418\092418F019.D	Lab Control Sample	KQ1812810-01	9/24/2018	18:22	
Y:\MS42\data\092418\092418F020.D	Duplicate Lab Control Sample	KQ1812810-02	9/24/2018	18:40	
Y:\MS42\data\092418\092418F021.D	PDI-RB-VV-090718	K1808703-003	9/24/2018	18:57	
Y:\MS42\data\092418\092418F022.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	19:15	
Y:\MS42\data\092418\092418F023.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	19:33	
Y:\MS42\data\092418\092418F024.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	19:50	
Y:\MS42\data\092418\092418F025.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	20:08	
Y:\MS42\data\092418\092418F026.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	20:26	
Y:\MS42\data\092418\092418F027.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	20:43	
Y:\MS42\data\092418\092418F028.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	21:01	
Y:\MS42\data\092418\092418F030.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	21:36	
Y:\MS42\data\092418\092418F031.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	21:54	
Y:\MS42\data\092418\092418F032.D	ZZZZZZZ	ZZZZZZZ	9/24/2018	22:11	

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1808703

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Analysis Lot: 611291
Instrument ID: K-MS-42

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
Y:\MS42\data\101618\101618F018.D	Continuing Calibration Verification	KQ1814940-01	10/16/2018	19:15	
Y:\MS42\data\101618\101618F019.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	19:32	
Y:\MS42\data\101618\101618F020.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	19:50	
Y:\MS42\data\101618\101618F021.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	20:08	
Y:\MS42\data\101618\101618F022.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	20:25	
Y:\MS42\data\101618\101618F023.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	20:43	
Y:\MS42\data\101618\101618F024.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	21:00	
Y:\MS42\data\101618\101618F025.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	21:18	
Y:\MS42\data\101618\101618F026.D	Method Blank	KQ1814154-04	10/16/2018	21:36	
Y:\MS42\data\101618\101618F027.D	Lab Control Sample	KQ1814154-03	10/16/2018	21:53	
Y:\MS42\data\101618\101618F028.D	PDI-SG-B479 MS	KQ1814154-01	10/16/2018	22:11	
Y:\MS42\data\101618\101618F029.D	PDI-SG-B479 DMS	KQ1814154-02	10/16/2018	22:29	
Y:\MS42\data\101618\101618F030.D	PDI-SG-B479	K1808703-002	10/16/2018	22:46	
Y:\MS42\data\101618\101618F031.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	23:04	
Y:\MS42\data\101618\101618F032.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	23:21	
Y:\MS42\data\101618\101618F033.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	23:39	
Y:\MS42\data\101618\101618F034.D	ZZZZZZZ	ZZZZZZZ	10/16/2018	23:57	

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request:K1808703

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Analysis Lot:612484
Instrument ID:K-MS-42

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
Y:\MS42\data\102418\102418F004.D	Continuing Calibration Verification	KQ1815515-01	10/24/2018	14:31	
Y:\MS42\data\102418\102418F005.D	Method Blank	KQ1814562-04	10/24/2018	14:49	
Y:\MS42\data\102418\102418F006.D	Lab Control Sample	KQ1814562-03	10/24/2018	15:07	
Y:\MS42\data\102418\102418F007.D	Batch QC MS	KQ1814562-01	10/24/2018	15:24	
Y:\MS42\data\102418\102418F008.D	Batch QC DMS	KQ1814562-02	10/24/2018	15:42	
Y:\MS42\data\102418\102418F010.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	16:17	
Y:\MS42\data\102418\102418F011.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	16:35	
Y:\MS42\data\102418\102418F012.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	16:52	
Y:\MS42\data\102418\102418F013.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	17:10	
Y:\MS42\data\102418\102418F014.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	17:27	
Y:\MS42\data\102418\102418F015.D	Batch QC	K1809944-011	10/24/2018	17:45	
Y:\MS42\data\102418\102418F016.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	18:03	
Y:\MS42\data\102418\102418F017.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	18:20	
Y:\MS42\data\102418\102418F018.D	ZZZZZZZ	ZZZZZZZ	10/24/2018	18:38	

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QA/QC Report

Client: AECOM

Service Request:K1808703

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method:

Analysis Lot:612678

Instrument ID:K-MS-42

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
Y:\MS42\data\102518\102518F004.D	ZZZZZZZ	ZZZZZZZ	10/25/2018	14:01	
Y:\MS42\data\102518\102518F004.D	Continuing Calibration Verification	KQ1815597-02	10/25/2018	14:01	
Y:\MS42\data\102518\102518F007.D	PDI-SG-B431	K1808703-001	10/25/2018	15:15	
Y:\MS42\data\102518\102518F008.D	ZZZZZZZ	ZZZZZZZ	10/25/2018	15:33	
Y:\MS42\data\102518\102518F010.D	ZZZZZZZ	ZZZZZZZ	10/25/2018	16:11	
Y:\MS42\data\102518\102518F011.D	ZZZZZZZ	ZZZZZZZ	10/25/2018	16:29	
Y:\MS42\data\102518\102518F012.D	ZZZZZZZ	ZZZZZZZ	10/25/2018	16:46	

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Prep Summary Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request:K1808703

Organochlorine Pesticides by GC/MS/MS

Prep Method: EPA 3541
Analytical Method: ALS SOP

Extraction Lot: 323933
Extraction Date: 10/11/18 17:23

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-SG-B431	K1808703-001	9/7/18	9/11/18	5.108 g	1 mL	66.2
Batch QC	K1809944-011	NA	NA	20.224 g	1 mL	37.1
Matrix Spike	KQ1814562-01MS	NA	NA	20.278 g	1 mL	37.1
Duplicate Matrix Spike	KQ1814562-02DMS	NA	NA	20.258 g	1 mL	37.1
Lab Control Sample	KQ1814562-03LCS	NA	NA	10 g	1 mL	
Method Blank	KQ1814562-04MB	NA	NA	20.3690 g	1 mL	

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Prep Summary Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Service Request:K1808703

Organochlorine Pesticides by GC/MS/MS

Prep Method: EPA 3541
Analytical Method: ALS SOP

Extraction Lot: 323457
Extraction Date: 10/05/18 00:38

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-SG-B479	K1808703-002	9/7/18	9/11/18	5.123 g	1 mL	54.5
Matrix Spike	KQ1814154-01MS	9/7/18	9/11/18	5.162 g	1 mL	54.5
Duplicate Matrix Spike	KQ1814154-02DMS	9/7/18	9/11/18	5.198 g	1 mL	54.5
Lab Control Sample	KQ1814154-03LCS	NA	NA	10 g	1 mL	
Method Blank	KQ1814154-04MB	NA	NA	10 g	1 mL	

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Prep Summary Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1808703

Organochlorine Pesticides by GC/MS/MS

Prep Method: EPA 3535A
Analytical Method: ALS SOP

Extraction Lot: 321892
Extraction Date: 09/14/18 07:16

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-RB-VV-090718	K1808703-003	9/7/18	9/11/18	860.0000 mL	1 mL	
Lab Control Sample	KQ1812810-01LCS	NA	NA	1000 mL	1 mL	
Duplicate Lab Control Sample	KQ1812810-02DLCS	NA	NA	1000 mL	1 mL	
Method Blank	KQ1812810-03MB	NA	NA	1000 mL	1 mL	