

N3172B.AR.003119
NASD VIEQUES
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VALIDATED LABORATORY DATA PACKAGE, K1410497 & K1410499, VIEQUES ISLAND
PUERTO RICO
09/18/2014
DATAQUAL

DataQual

Environmental Services, LLC

CH2M HILL-VBO
 5701 Cleveland Street
 Suite 200
 Virginia Beach, VA 23462

January 5, 2015
 ALS Environmental – SR #s K1410497 & K1410499
 CTO-037, NTR Vieques West SWMU 4 Tissue Sampling

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for Service Request #s K1410497 & K1410499. The data validation was performed in accordance with the laboratory SOPs, professional judgment, the guidance offered in the DoD Quality Systems Manual for Environmental Laboratories Version 5.0 and the project specific SAP. There is no current Region II SOP for the explosives analyses by LC-MS. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	Select Explosives	Picric Acid
Homogenization Blank - Fish	K1410499-011	water	X	X
Homogenization Blank - Crab	K1410497-014	water	X	X
VWW04-BAB01-0914	K1410499-005	tissue	X	X
VWW04-CRB01-0914	K1410499-001	tissue	X	X
VWW04-CRB01P-0914	K1410499-006	tissue	X	X
VWW04-CRB02-0914	K1410499-002	tissue	X	X
VWW04-CRB03-0914	K1410499-003	tissue	X	X
VWW04-CRB04-0914	K1410499-004	tissue	X	X
VWW04-CRB05-0914	K1410497-001	tissue	X	X
VWW04-CRB06-0914	K1410497-002	tissue	X	X
VWW04-CRB07-0914	K1410497-003	tissue	X	X
VWW04-CRB08-0914	K1410497-004	tissue	X	X
VWW04-CRB09-0914	K1410497-005	tissue	X	X
VWW04-CRB10-0914	K1410497-006	tissue	X	X
VWW04-CRB10-0914 MS	K1410497-006MS	tissue	X	X
VWW04-CRB10-0914 MSD	K1410497-006MSD	tissue	X	X
VWW04-FS01-0914	K1410499-007	tissue	X	X
VWW04-FS01P-0914	K1410499-008	tissue	X	X
VWW04-FS02-0914	K1410497-007	tissue	X	X
VWW04-FS03-0914	K1410497-008	tissue	X	X
VWW04-FS04-0914	K1410497-009	tissue	X	X
VWW04-FS05-0914	K1410497-010	tissue	X	X
VWW04-FS06-0914	K1410497-011	tissue	X	X
VWW04-FS07-0914	K1410499-009	tissue	X	X
VWW04-FS08-0914	K1410497-012	tissue	X	X

001

Sample ID	Lab ID	Matrix	Select Explosives	Picric Acid
VWW04-FS09-0914	K1410497-013	tissue	X	X
VWW04-FS10-0914	K1410499-010	tissue	X	X
VWW04-FS10-0914 MS	K1410499-010MS	tissue	X	X
VWW04-FS10-0914 MSD	K1410499-010MSD	tissue	X	X

The following quality control samples were provided with this SDG: sample VWW04-FS01P-0914-field duplicate of sample VWW04-FS01-0914; sample VWW04-CRB01P-0914-field duplicate of sample VWW04-CRB01-0914; and two homogenization blanks – crab & fish.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- Initial/Continuing Calibrations *
- Internal Standards *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Field Duplicates *
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data in this data package is reported without qualification.

Select Explosives by Lab SOP

Please note that the reporting limits for picric acid in samples VWW04-CRB06-0914, VWW04-CRB09-0914, VWW04-CRB10-0914, VWW04-CRB02-0914, VWW04-CRB03-0914 and VWW04-CRB04-0914 were elevated as a result of matrix interferences that seemed to be suppressing the internal standard. The extracts were diluted in an effort to achieve improved resolution. The MS/MSD recoveries in sample VWW04-CRB10-0914 were acceptable. No qualification of the analytical results was required.

Qualifications were required due to non-compliant surrogate recoveries.

Qualifications were required in all of the field samples due to low LCS recoveries.

Qualifications were required in the native samples due to the non-compliant recoveries noted in the MS/MSD pairs.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Additional information regarding the calculations for the picric acid method was requested from the lab. All requested information was received from the lab. A copy of all email correspondence is included in the worksheets section of this report.

Technical Holding Times

According to chain of custody records, sampling was performed on 9/18-19/14 and samples were received at ALS Environmental lab on 9/26-27/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Surrogate Recoveries

Select Explosives by Lab SOP

The surrogate compound C13-HMX was recovered below the lower QC limit in VWW04-FS02-0914 (65%). The surrogate compound 1, 3-DNB was recovered below the lower QC limit in VWW04-BAB01-0914 (68%). The reported results for HMX, RDX & 2,4,6-TNT were qualified as J-/UJ with a qualifier code of SSL in these two samples.

Laboratory Control Samples

Select Explosives by Lab SOP

The LCS samples associated with the tissue field samples exhibited non-compliant recoveries below the lower QC limit for HMX (58% & 55%) and RDX (66% & 66%). All reported positive and non-detect results in the tissue samples were qualified as estimated biased low J-/UJ with a qualifier code of BSL.

The LCS samples associated with the homogenization blank samples exhibited non-compliant recoveries below the lower QC limit for HMX (68%). All reported positive and non-detect results in the two homogenization blank samples were qualified as estimated biased low J-/UJ with a qualifier code of BSL.

Matrix Spike Recoveries

Select Explosives by Lab SOP

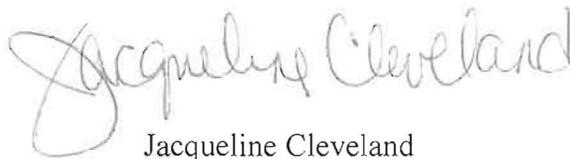
The matrix spike pair of sample VWW06-CRB10-0914 exhibited recoveries below the lower QC limit at 68% & 63% for the target compound 2,4,6-TNT. The reported result for 2,4,6-TNT in the native sample was qualified as estimated biased low J-/UJ with a qualifier code of MSL.

The matrix spike pair of sample VWW06-FS10-0914 exhibited recoveries below the lower QC limits at 68% for the target compound 2,4,6-TNT and 66% for the target compound HMX. The reported results for 2,4,6-TNT and HMX in the native sample were qualified as estimated biased low J-/UJ with a qualifier code of MSL.

The matrix spike pair of sample VWW06-FS10-0914 exhibited recoveries below the lower QC limits at 55% & 72% for the target compound picric acid. The reported result for picric acid in the native sample was qualified as estimated biased low J-/UJ with a qualifier code of MSL.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Jacqueline Cleveland
Vice President

Summary of Data Qualifications

Select Explosives by Lab SOP

Sample ID	Compound	Results	Q Flag	Q Code
VWW04-FS02-0914, VWW04-BAB01-0914	HMX* RDX* 2,4,6-TNT	+/-	J-/UJ	SSL
all field samples	HMX RDX	+/-	J-/UJ	BSL
all QC blank samples	HMX	+/-	J-/UJ	BSL
VWW04-CRB10-0914	2,4,6-TNT	+/-	J-/UJ	MSL
VWW04-FS10-0914	HMX* 2,4,6-TNT	+/-	J-/UJ	MSL
VWW04-FS10-0914	picric acid	+/-	J-/UJ	MSL

**Please note that the compounds HMX and RDX were qualified as estimated biased low based on LCS recoveries with a final qualifier code of BSL in all field samples.*

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

- No Action - The sample result is greater than the LOD and greater than ten times (10X) the blank value.
- U - The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
- R - Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
- J+ - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB05-0914
Lab Code: K1410497-001

Service Request: K1410497
Date Collected: 09/19/14 09:05
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>WJ BSL</i>	2.2	2.2	1.4	1	10/22/14 18:08	10/2/14	<i>*</i>
RDX	ND U <i>↓ ↓</i>	2.2	2.2	1.6	1	10/22/14 18:08	10/2/14	<i>*</i>
2,4,6-Trinitrotoluene (TNT)	ND U	2.2	1.1	0.30	1	10/22/14 18:08	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	103	70 - 130 -	10/22/14 18:08	
1,3-Dinitrobenzene-C13	115	70 - 130 -	10/22/14 18:08	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB06-0914
Lab Code: K1410497-002

Service Request: K1410497
Date Collected: 09/19/14 08:40
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U	2.5	2.5	1.5	1	10/22/14 19:19	10/2/14	*
RDX	ND U	2.5	2.5	1.8	1	10/22/14 19:19	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.5	1.2	0.33	1	10/22/14 19:19	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	93	70 - 130 -	10/22/14 19:19	
1,3-Dinitrobenzene-C13	104	70 - 130 -	10/22/14 19:19	

JAC
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ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB07-0914
Lab Code: K1410497-003

Service Request: K1410497
Date Collected: 09/19/14 08:10
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>↓ ↓ BSL</i>	3.3	3.3	2.0	1	10/22/14 20:31	10/2/14	<i>*</i>
RDX	ND U <i>↓ ↓</i>	3.3	3.3	2.4	1	10/22/14 20:31	10/2/14	<i>*</i>
2,4,6-Trinitrotoluene (TNT)	ND U	3.3	1.7	0.44	1	10/22/14 20:31	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	93	70 - 130 -	10/22/14 20:31	
1,3-Dinitrobenzene-C13	108	70 - 130 -	10/22/14 20:31	

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12/22/14*

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB08-0914
Lab Code: K1410497-004

Service Request: K1410497
Date Collected: 09/19/14 07:50
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>WPSL</i>	2.6	2.6	1.6	1	10/22/14 21:42	10/2/14	*
RDX	ND U <i>WPSL</i>	2.6	2.6	1.9	1	10/22/14 21:42	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.6	1.3	0.35	1	10/22/14 21:42	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	107	70 - 130 -	10/22/14 21:42	
1,3-Dinitrobenzene-C13	105	70 - 130 -	10/22/14 21:42	

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12/22/14*

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB09-0914
Lab Code: K1410497-005

Service Request: K1410497
Date Collected: 09/19/14 07:55
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U	2.7	2.7	1.7	1	10/22/14 22:53	10/2/14	*
RDX	ND U	2.7	2.7	1.9	1	10/22/14 22:53	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.7	1.3	0.36	1	10/22/14 22:53	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	95	70 - 130 -	10/22/14 22:53	
1,3-Dinitrobenzene-C13	88	70 - 130 -	10/22/14 22:53	

JAC
10/22/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB10-0914
Lab Code: K1410497-006

Service Request: K1410497
Date Collected: 09/19/14 08:20
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND <i>ψ WT BSL</i>	2.8	2.8	1.7	1	10/23/14 00:04	10/2/14	*
RDX	ND <i>ψ ↓ ↓</i>	2.8	2.8	2.0	1	10/23/14 00:04	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND <i>ψ WT msl</i>	2.8	1.4	0.36	1	10/23/14 00:04	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	85	70 - 130 -	10/23/14 00:04	
1,3-Dinitrobenzene-C13	97	70 - 130 -	10/23/14 00:04	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS02-0914
Lab Code: K1410497-007

Service Request: K1410497
Date Collected: 09/19/14 08:00
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND <i>U UJ BSL</i>	2.1	2.1	1.3	1	10/23/14 03:38	10/2/14	*
RDX	ND <i>U UJ</i>	2.1	2.1	1.5	1	10/23/14 03:38	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND <i>U UJ SSL</i>	2.1	1.1	0.28	1	10/23/14 03:38	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	65	70 - 130 -	10/23/14 03:38	*
1,3-Dinitrobenzene-C13	102	70 - 130 -	10/23/14 03:38	

JAC
12/20/14

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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS03-0914
Lab Code: K1410497-008

Service Request: K1410497
Date Collected: 09/19/14 08:05
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>UJT BSL</i>	2.2	2.2	1.4	1	10/23/14 04:49	10/2/14	*
RDX	ND U <i>UJT BSL</i>	2.2	2.2	1.6	1	10/23/14 04:49	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.2	1.1	0.29	1	10/23/14 04:49	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	73	70 - 130 -	10/23/14 04:49	
1,3-Dinitrobenzene-C13	101	70 - 130 -	10/23/14 04:49	

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12/20/14*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS04-0914
Lab Code: K1410497-009

Service Request: K1410497
Date Collected: 09/19/14 08:15
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>UJ BSL</i>	2.4	2.4	1.5	1	10/23/14 07:12	10/2/14	<i>*</i>
RDX	ND U <i>↓</i>	2.4	2.4	1.7	1	10/23/14 07:12	10/2/14	<i>*</i>
2,4,6-Trinitrotoluene (TNT)	ND U	2.4	1.2	0.31	1	10/23/14 07:12	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	86	70 - 130 -	10/23/14 07:12	
1,3-Dinitrobenzene-C13	123	70 - 130 -	10/23/14 07:12	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS05-0914
Lab Code: K1410497-010

Service Request: K1410497
Date Collected: 09/19/14 08:25
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>UWSL</i>	2.0	2.0	1.3	1	10/23/14 08:23	10/2/14	*
RDX	ND U <i>↓ ↓</i>	2.0	2.0	1.5	1	10/23/14 08:23	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.0	1.0	0.27	1	10/23/14 08:23	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	84	70 - 130 -	10/23/14 08:23	
1,3-Dinitrobenzene-C13	121	70 - 130 -	10/23/14 08:23	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS06-0914
Lab Code: K1410497-011

Service Request: K1410497
Date Collected: 09/19/14 08:30
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U ↓ J BSL	2.2	2.2	1.4	1	10/23/14 09:34	10/2/14	*
RDX	ND U ↓	2.2	2.2	1.6	1	10/23/14 09:34	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.2	1.1	0.29	1	10/23/14 09:34	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	79	70 - 130 -	10/23/14 09:34	
1,3-Dinitrobenzene-C13	117	70 - 130 -	10/23/14 09:34	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS08-0914
Lab Code: K1410497-012

Service Request: K1410497
Date Collected: 09/19/14 08:40
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND <i>UJ BSC</i>	2.2	2.2	1.4	1	10/23/14 10:46	10/2/14	*
RDX	ND <i>U ↓</i>	2.2	2.2	1.6	1	10/23/14 10:46	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND <i>U</i>	2.2	1.1	0.30	1	10/23/14 10:46	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	79	70 - 130 -	10/23/14 10:46	
1,3-Dinitrobenzene-C13	125	70 - 130 -	10/23/14 10:46	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS09-0914
Lab Code: K1410497-013

Service Request: K1410497
Date Collected: 09/19/14 08:50
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>UWS BSL</i>	2.2	2.2	1.4	1	10/23/14 11:57	10/2/14	*
RDX	ND U <i>↓ ↓ ↓</i>	2.2	2.2	1.6	1	10/23/14 11:57	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.2	1.1	0.29	1	10/23/14 11:57	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	81	70 - 130 -	10/23/14 11:57	
1,3-Dinitrobenzene-C13	113	70 - 130 -	10/23/14 11:57	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Ground Water
Sample Name: Homogenization Blank
Lab Code: K1410497-014

Service Request: K1410497
Date Collected: 09/23/14
Date Received: 09/26/14 09:45

Units: ug/L
Basis: NA

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND <i>UJ BSL</i>	1.2	1	10/21/14 09:29	10/7/14	*
RDX	ND U	1.4	1	10/21/14 09:29	10/7/14	
2,4,6-Trinitrotoluene (TNT)	ND U	1.0	1	10/21/14 09:29	10/7/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	82	70 - 130	10/21/14 09:29	
1,3-Dinitrobenzene-C13	108	70 - 130	10/21/14 09:29	

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12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB05-0914
Lab Code: K1410497-001

Service Request: K1410497
Date Collected: 09/19/14 09:05
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.22	0.444	0.156	1	10/25/14 02:58	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	92	70 - 130 -	10/25/14 02:58	

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12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB06-0914
Lab Code: K1410497-002

Service Request: K1410497
Date Collected: 09/19/14 08:40
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	24.9	4.97	1.75	10	10/27/14 12:54	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	91	70 - 130 -	10/27/14 12:54	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB07-0914
Lab Code: K1410497-003

Service Request: K1410497
Date Collected: 09/19/14 08:10
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	3.37	0.674	0.236	1	10/25/14 04:06	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	79	70 - 130	10/25/14 04:06	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB08-0914
Lab Code: K1410497-004

Service Request: K1410497
Date Collected: 09/19/14 07:50
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.76	0.552	0.194	1	10/25/14 04:23	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	86	70 - 130 -	10/25/14 04:23	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB09-0914
Lab Code: K1410497-005

Service Request: K1410497
Date Collected: 09/19/14 07:55
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	26.0	5.20	1.83	10	10/27/14 13:11	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	102	70 - 130 -	10/27/14 13:11	

*SAC
12/20/14*

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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB10-0914
Lab Code: K1410497-006

Service Request: K1410497
Date Collected: 09/19/14 08:20
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	27.7	5.54	1.94	10	10/27/14 13:28	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	91	70 - 130 -	10/27/14 13:28	

JAC
12/22/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS02-0914
Lab Code: K1410497-007

Service Request: K1410497
Date Collected: 09/19/14 08:00
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.22	0.443	0.156	1	10/25/14 05:49	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	89	70 - 130 -	10/25/14 05:49	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS03-0914
Lab Code: K1410497-008

Service Request: K1410497
Date Collected: 09/19/14 08:05
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.16	0.432	0.152	1	10/25/14 06:06	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	90	70 - 130 -	10/25/14 06:06	

JEC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS04-0914
Lab Code: K1410497-009

Service Request: K1410497
Date Collected: 09/19/14 08:15
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.45	0.490	0.172	1	10/25/14 06:23	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	83	70 - 130 -	10/25/14 06:23	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS05-0914
Lab Code: K1410497-010

Service Request: K1410497
Date Collected: 09/19/14 08:25
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.15	0.431	0.151	1	10/25/14 06:40	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	90	70 - 130	10/25/14 06:40	

JPC
12/20/14

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS06-0914
Lab Code: K1410497-011

Service Request: K1410497
Date Collected: 09/19/14 08:30
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.21	0.443	0.155	1	10/25/14 07:31	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	79	70 - 130 -	10/25/14 07:31	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS08-0914
Lab Code: K1410497-012

Service Request: K1410497
Date Collected: 09/19/14 08:40
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.27	0.455	0.160	1	10/25/14 07:48	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	79	70 - 130 -	10/25/14 07:48	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS09-0914
Lab Code: K1410497-013

Service Request: K1410497
Date Collected: 09/19/14 08:50
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.21	0.442	0.155	1	10/25/14 08:05	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	89	70 - 130 -	10/25/14 08:05	

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12/20/14*

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Ground Water
Sample Name: Homogenization Blank
Lab Code: K1410497-014

Service Request: K1410497
Date Collected: 09/23/14
Date Received: 09/26/14 09:45

Units: ug/L
Basis: NA

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	1.0	1	09/30/14 21:42	9/30/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	87	70 - 130	09/30/14 21:42	

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ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB01-0914
Lab Code: K1410499-001

Service Request: K1410499
Date Collected: 09/18/14 12:30
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND <i>UW BSL</i>	2.9	2.9	1.8	1	10/23/14 13:08	10/2/14	*
RDX	ND <i>U ↓ ↓</i>	2.9	2.9	2.1	1	10/23/14 13:08	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.9	1.4	0.38	1	10/23/14 13:08	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	82	70 - 130 -	10/23/14 13:08	
1,3-Dinitrobenzene-C13	96	70 - 130 -	10/23/14 13:08	

JM
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWV04-CRB02-0914
Lab Code: K1410499-002

Service Request: K1410499
Date Collected: 09/18/14 12:35
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>WJ BSL</i>	3.2	3.2	2.0	1	10/23/14 14:19	10/2/14	<i>*</i>
RDX	ND U <i>↓ ↓</i>	3.2	3.2	2.3	1	10/23/14 14:19	10/2/14	<i>*</i>
2,4,6-Trinitrotoluene (TNT)	ND U	3.2	1.6	0.42	1	10/23/14 14:19	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	91	70 - 130 -	10/23/14 14:19	
1,3-Dinitrobenzene-C13	83	70 - 130 -	10/23/14 14:19	

*JAC
10/20/14*

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWV04-CRB03-0914
Lab Code: K1410499-003

Service Request: K1410499
Date Collected: 09/18/14 13:45
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>4J BSL</i>	2.9	2.9	1.8	1	10/23/14 15:31	10/2/14	<i>✓</i>
RDX	ND U <i>↓ ↓</i>	2.9	2.9	2.1	1	10/23/14 15:31	10/2/14	<i>✓</i>
2,4,6-Trinitrotoluene (TNT)	ND U	2.9	1.5	0.38	1	10/23/14 15:31	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	83	70 - 130 -	10/23/14 15:31	
1,3-Dinitrobenzene-C13	78	70 - 130 -	10/23/14 15:31	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB04-0914
Lab Code: K1410499-004

Service Request: K1410499
Date Collected: 09/18/14 13:50
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>UJ BSL</i>	2.5	2.5	1.6	1	10/23/14 16:42	10/2/14	<i>u*</i>
RDX	ND U <i>UJ BSL</i>	2.5	2.5	1.8	1	10/23/14 16:42	10/2/14	<i>u*</i>
2,4,6-Trinitrotoluene (TNT)	ND U	2.5	1.3	0.33	1	10/23/14 16:42	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	79	70 - 130 -	10/23/14 16:42	
1,3-Dinitrobenzene-C13	89	70 - 130 -	10/23/14 16:42	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-BAB01-0914
Lab Code: K1410499-005

Service Request: K1410499
Date Collected: 09/18/14 14:00
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U ↓ W ↓ BSL	2.9	2.9	1.8	1	10/23/14 19:05	10/2/14	*
RDX	ND U ↓ W ↓	2.9	2.9	2.1	1	10/23/14 19:05	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U ↓ W ↓ SSL	2.9	1.4	0.38	1	10/23/14 19:05	10/2/14	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	83	70 - 130 -	10/23/14 19:05	
1,3-Dinitrobenzene-C13	68	70 - 130 -	10/23/14 19:05	*

JAC
12-2014

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB01P-0914
Lab Code: K1410499-006

Service Request: K1410499
Date Collected: 09/18/14 12:30
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND <i>UW</i> <i>ESL</i>	3.0	3.0	1.9	1	10/23/14 20:16	10/2/14	<i>*</i>
RDX	ND <i>U</i> <i>↓</i>	3.0	3.0	2.2	1	10/23/14 20:16	10/2/14	<i>*</i>
2,4,6-Trinitrotoluene (TNT)	ND <i>U</i>	3.0	1.5	0.40	1	10/23/14 20:16	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	81	70 - 130 -	10/23/14 20:16	
1,3-Dinitrobenzene-C13	87	70 - 130 -	10/23/14 20:16	

JAC
12/20/14

ALS Group USA, Corp.
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Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS01-0914
Lab Code: K1410499-007

Service Request: K1410499
Date Collected: 09/19/14 07:45
Date Received: 09/27/14 09:30

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>W</i> <i>ESL</i>	3.1	3.1	1.9	1	10/23/14 21:27	10/2/14	<i>+</i>
RDX	ND U <i>↓</i>	3.1	3.1	2.2	1	10/23/14 21:27	10/2/14	<i>+</i>
2,4,6-Trinitrotoluene (TNT)	ND U	3.1	1.5	0.41	1	10/23/14 21:27	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	82	70 - 130 -	10/23/14 21:27	
1,3-Dinitrobenzene-C13	99	70 - 130 -	10/23/14 21:27	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS01P-0914
Lab Code: K1410499-008

Service Request: K1410499
Date Collected: 09/19/14 07:45
Date Received: 09/27/14 09:30
Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>WJ BSC</i>	2.9	2.9	1.8	1	10/23/14 22:38	10/2/14	<i>*</i>
RDX	ND U <i>↓ ↓</i>	2.9	2.9	2.1	1	10/23/14 22:38	10/2/14	<i>*</i>
2,4,6-Trinitrotoluene (TNT)	ND U	2.9	1.5	0.38	1	10/23/14 22:38	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	82	70 - 130 -	10/23/14 22:38	
1,3-Dinitrobenzene-C13	96	70 - 130 -	10/23/14 22:38	

*JAC
12/20/14*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS07-0914
Lab Code: K1410499-009

Service Request: K1410499
Date Collected: 09/19/14 08:35
Date Received: 09/27/14 09:30

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND Ψ WT BSL	2.3	2.3	1.4	1	10/23/14 23:50	10/2/14	*
RDX	ND Ψ \downarrow	2.3	2.3	1.6	1	10/23/14 23:50	10/2/14	*
2,4,6-Trinitrotoluene (TNT)	ND U	2.3	1.1	0.30	1	10/23/14 23:50	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	87	70 - 130 -	10/23/14 23:50	
1,3-Dinitrobenzene-C13	94	70 - 130 -	10/23/14 23:50	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS10-0914
Lab Code: K1410499-010

Service Request: K1410499
Date Collected: 09/19/14 09:00
Date Received: 09/27/14 09:30

Units: ug/Kg
Basis: Wet

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>WJ BSL</i>	2.6	2.6	1.6	1	10/24/14 01:01	10/2/14	<i>*/</i>
RDX	ND U <i>WJ BSL</i>	2.6	2.6	1.9	1	10/24/14 01:01	10/2/14	<i>*/</i>
2,4,6-Trinitrotoluene (TNT)	ND <i>WJMSL</i>	2.6	1.3	0.35	1	10/24/14 01:01	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	90	70 - 130 -	10/24/14 01:01	
1,3-Dinitrobenzene-C13	103	70 - 130 -	10/24/14 01:01	

JAC
1915

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Water
Sample Name: Homog Blank - Fish
Lab Code: K1410499-011

Service Request: K1410499
Date Collected: 09/24/14
Date Received: 09/27/14 09:30

Units: ug/L
Basis: NA

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
HMX	ND U <i>WJ OSL</i>	1.2	1	10/21/14 10:04	10/7/14	<i>✓</i>
RDX	ND U	1.4	1	10/21/14 10:04	10/7/14	
2,4,6-Trinitrotoluene (TNT)	ND U	1.0	1	10/21/14 10:04	10/7/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
C13-HMX	86	70 - 130	10/21/14 10:04	
1,3-Dinitrobenzene-C13	102	70 - 130	10/21/14 10:04	

*JAC
12/20/14*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB01-0914
Lab Code: K1410499-001

Service Request: K1410499
Date Collected: 09/18/14 12:30
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.52	0.503	0.177	1	10/25/14 08:22	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	93	70 - 130 -	10/25/14 08:22	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB02-0914
Lab Code: K1410499-002

Service Request: K1410499
Date Collected: 09/18/14 12:35
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	30.4	6.09	2.14	10	10/27/14 14:19	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	92	70 - 130 -	10/27/14 14:19	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB03-0914
Lab Code: K1410499-003

Service Request: K1410499
Date Collected: 09/18/14 13:45
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	30.3	6.06	2.13	10	10/27/14 14:36	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	82	70 - 130 -	10/27/14 14:36	

JJC
10/27/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB04-0914
Lab Code: K1410499-004

Service Request: K1410499
Date Collected: 09/18/14 13:50
Date Received: 09/26/14 09:45

Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	23.4	4.69	1.65	10	10/27/14 14:53	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	96	70 - 130 -	10/27/14 14:53	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-BAB01-0914
Lab Code: K1410499-005

Service Request: K1410499
Date Collected: 09/18/14 14:00
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.82	0.564	0.198	1	10/25/14 10:05	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	74	70 - 130 -	10/25/14 10:05	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-CRB01P-0914
Lab Code: K1410499-006

Service Request: K1410499
Date Collected: 09/18/14 12:30
Date Received: 09/26/14 09:45
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.85	0.570	0.200	1	10/25/14 10:22	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	97	70 - 130 -	10/25/14 10:22	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS01-0914
Lab Code: K1410499-007

Service Request: K1410499
Date Collected: 09/19/14 07:45
Date Received: 09/27/14 09:30
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.84	0.567	0.199	1	10/25/14 10:39	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	90	70 - 130 -	10/25/14 10:39	

JLC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS01P-0914
Lab Code: K1410499-008

Service Request: K1410499
Date Collected: 09/19/14 07:45
Date Received: 09/27/14 09:30
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.73	0.546	0.192	1	10/25/14 10:56	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	76	70 - 130 -	10/25/14 10:56	

*SIC
12/20/14*

ALS Group USA, Corp.
 dba ALS Environmental
 Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS07-0914
Lab Code: K1410499-009

Service Request: K1410499
Date Collected: 09/19/14 08:35
Date Received: 09/27/14 09:30
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	2.34	0.467	0.164	1	10/25/14 11:13	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	92	70 - 130	10/25/14 11:13	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue
Sample Name: VWW04-FS10-0914
Lab Code: K1410499-010

Service Request: K1410499
Date Collected: 09/19/14 09:00
Date Received: 09/27/14 09:30
Units: ug/Kg
Basis: Wet, Frz Dried

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND <i>WMSL</i>	2.83	0.566	0.199	1	10/25/14 11:30	10/2/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	79	70 - 130 -	10/25/14 11:30	

JAC
12/20/14

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Water
Sample Name: Homog Blank - Fish
Lab Code: K1410499-011

Service Request: K1410499
Date Collected: 09/24/14
Date Received: 09/27/14 09:30

Units: ug/L
Basis: NA

Nitrophenols by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Prep Method: ALS SOP

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
Picric Acid	ND U	1.0	1	09/30/14 21:59	9/30/14	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4,6-Dinitro-2-methylphenol-d2	95	70 - 130	09/30/14 21:59	

JAC
12/20/14

ALS ENVIRONMENTAL

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue and Water

Service Request No.: K1410497
Date Received: 09/26/14

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

Thirteen tissue and one water sample were received for analysis at ALS Environmental on 09/26/14. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C and frozen at -20°C as required upon receipt at the laboratory.

Nitroaromatics and Nitramines by ALS SOP

Surrogate Exceptions:

The recovery of surrogate 1,3-Dinitrobenzene-C13 in sample VWV04-FS02-0914 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

The recovery of surrogate C13-HMX in Batch QC Lab Control Sample KQ1412299-03 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

Matrix Spike Recovery Exceptions:

The recovery of 2,4,6-Trinitrotoluene in matrix spikes in sample VWV04-FS10-0914 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

Lab Control Sample Exceptions:

The recovery of HMX in Lab Control Sample KQ1412507-01 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

The recovery of HMX in Lab Control Sample KQ1412299-03 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



Nitrophenols by ALS SOP

Elevated Detection Limits:

The detection limit was elevated for Picric Acid in samples VWW04-CRB06-0914, VWW04-CRB09-0914, and VWW04-CRB10-0914. The analysis indicated the presence of non-target background components suppressing the instrument internal standard. The samples were diluted in order to achieve optimal resolution of the target analytes.

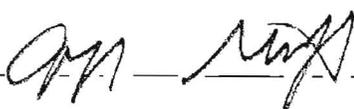
No other anomalies associated with the analysis of these samples were observed.

Lipids

The RPD on the triplicate analysis failed high at 24% (allowable <20%). The extracts were re-analyzed and produced similar results. The difference is likely due to homogenization limitations. The LCS with the batch was acceptable. Original results are being reported.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____

Handwritten signatures in black ink, appearing to be initials or names, written over a horizontal line.



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 Seattle, WA 98107
 Phone: 206-632-6206
 Fax: 206-632-6017

samples@brooksrand.com
 www.brooksrand.com

Chain of Custody Record

K1410497

White: LAB COPY
 Yellow: CUSTOMER COPY

Client: <u>JULIANA PEARN</u>	Address: <u>5701 CLEVELAND ST. SUITE 200</u> <u>VIRGINIA BEACH, VA</u> <u>23462</u>	COC receipt confirmation? Y / N
Contact: <u>CHAM HILL</u>		If so, by: email / fax (circle one)
Client project ID:		Email:
PO #:	Phone #: <u>757-497-6885</u>	Fax #:

Requested TAT in business days: <input type="checkbox"/> 20 (standard) <input type="checkbox"/> 15 <input type="checkbox"/> 10 <input type="checkbox"/> 5 <input type="checkbox"/> Other _____ <small>Surcharges apply for expedited turn around times.</small>	Collection		Miscellaneous				Field Preservation			Analyses required							Comments	
	Date	Time	Sampler (initials)	Matrix type	# of containers	Field filtered? (Y/N)	Unpreserved / ice only	HCl / HNO ₃ (circle one)	Other (specify)	Total Hg, EPA 1631	Methyl Hg, EPA 1630 ✓	ICP-MS Metals (specify)	As / Se species (specify)	% Solids	Filtration	Other (specify) Explosives		Other (specify) % Solids
	1	VWVW04-CR305-0914	9/19/14	0905	TS	TS	1				X	X	X	X	X			
	2	VWVW04-CR306-0914	9/19/14	0840	JRM	TS	1				X	X	X	X	X			
	3	VWVW04-CR307-0914	9/19/14	0810	JRM	TS	1				X	X	X	X	X			
	4	VWVW04-CR308-0914	9/19/14	0750	JRM	TS	1				X	X	X	X	X			
	5	VWVW04-CR309-0914	9/19/14	0755	JRM	TS	1				X	X	X	X	X			
	6	VWVW04-CR310-0914	9/19/14	0820	JRM	TS	1				X	X	X	X	X	X		QC Sample
	7	VWVW04-CR310-0914 MS	9/19/14	0820	JRM	TS	1				X	X	X	X	X			
	8	VWVW04-CR310-0914 SD	9/19/14	0820	JRM	TS	1				X	X	X	X	X			
	9																	
	10																	

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re to sub 10 sample

Relinquished by: <u>[Signature]</u>	Date: <u>9/19/14</u>	Time: <u>1300</u>	Relinquished by: <u>[Signature]</u>	Date: <u>9/25/14</u>	Time: <u>14:30</u>
Received by: <u>[Signature]</u>	Date: <u>9/20/14</u>	Time: <u>0945</u>	Received at BRL by: <u>[Signature]</u>	Date: <u>9/25/14</u>	Time: <u>0950</u>
Shipping carrier:	# of coolers: <u>3</u>	BRL work order ID: <u>1439006</u>	BRL project ID: <u>CHM-CH1401</u>		

059



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Chain of Custody Record

K1410497

White: LAB COPY
 Yellow: CUSTOMER COPY

Client: <u>JULIANA PEAR</u>	Address: <u>SAME</u>	COC receipt confirmation? Y / N
Contact: <u>CHARM HILL</u>		If so, by: email / fax (circle one)
Client project ID:		Email:
PO #:	Phone #:	Fax #:

Requested TAT in business days: <input type="checkbox"/> 20 (standard) <input type="checkbox"/> 15 <input type="checkbox"/> 10 <input type="checkbox"/> 5 <input type="checkbox"/> Other _____ <small>Surcharges apply for expedited turn around times.</small>	Collection		Miscellaneous				Field Preservation			Analyses required							Comments
	Date	Time	Sampler (Initials)	Matrix type	# of containers	Field filtered? (Y/N)	Unpreserved / ice only	HCl / HNO ₃ (circle one)	Other (specify)	Total Hg, EPA 1631	Methyl Hg, EPA 1630	ICP-MS Metals (specify)	As / Se species (specify)	% Solids	Filtration	Other (specify) Explosives	
Sample ID																	
* 1	VWVW04-F501-0914	9/19/14	0745	JRM	TS	1				X	X	X	X	X		X	X
* 2	VWVW04-F501P-0914	9/19/14	0745	JRM		1				X	X	X	X	X		X	X
7 3	VWVW04-F502-0914	9/19/14	0800	JRM		1				X	X	X	X	X		X	X
8 4	VWVW04-F503-0914	9/19/14	0805	JRM		1				X	X	X	X	X		X	X
9 5	VWVW04-F504-0914	9/19/14	0815	JRM		1				X	X	X	X	X		X	X
10 6	VWVW04-F505-0914	9/19/14	0825	JRM		1				X	X	X	X	X		X	X
11 7	VWVW04-F506-0914	9/19/14	0830	JRM		1				X	X	X	X	X		X	X
* 8	VWVW04-F507-0914	9/19/14	0835	JRM		1				X	X	X	X	X		X	X
12 9	VWVW04-F508-0914	9/19/14	0840	JRM		1				X	X	X	X	X		X	X
13 10	VWVW04-F509-0914	9/19/14	0850	JRM		1				X	X	X	X	X		X	X
Relinquished by: <u>[Signature]</u>		Date: 9/19/14	Time: 1300	Relinquished by: <u>[Signature]</u>		Date: 9/25/14	Time: 14:30										
Received by: <u>Bobb Kull</u>		Date: 9/26/14	Time: 0945	Received at BRL by: <u>[Signature]</u>		Date: 9/23/14	Time: 0950										
Shipping carrier:			# of coolers:	BRL work order ID: 1439006			BRL project ID: CHM-CH1401										

* to be shipped 9/26 for 9/27 delivery - SED

060



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samples@brooksrand.com
 www.brooksrand.com

Chain of Custody Record

K1410497

White: LAB COPY
 Yellow: CUSTOMER COPY

Client: <u>JULIANA PEARL</u>	Address: <u>SAME</u>	COC receipt confirmation? Y / N
Contact: <u>CHARM HILL</u>		If so, by: email / fax (circle one)
Client project ID:	Phone #:	Email:
PO #:		Fax #:

Requested TAT in business days: <input type="checkbox"/> 20 (standard) <input type="checkbox"/> 15 <input type="checkbox"/> 10 <input type="checkbox"/> 5 <input type="checkbox"/> Other _____ <small>Surcharges apply for expedited turn around times.</small>	Collection		Miscellaneous				Field Preservation			Analyses required						Comments			
	Date	Time	Sampler (initials)	Matrix type	# of containers	Field filtered? (Y/N)	Unpreserved / ice only	HCl / HNO ₃ (circle one)	Other (specify)	Total Hg, EPA 1631	Methyl Hg, EPA 1630	ICP-MS Metals (specify)	As / Se species (specify)	% Solids	Filtration		Other (specify) ^{Explosive}	Other (specify) ^{Leads}	
	Sample ID																		
	1	VWV04-FS10-0914	9/19/14	0900	JRM	TS	1					X	X	X	X	X			QC Sample
	2	VWV04-FS10-0914 MS	9/19/14	0900	JRM	TS	1					X	X	X	X	X			9/25/14
	3	VWV04-FS10-0914 SD	9/19/14	0900	JRM	TS	1					X	X	X	X	X			9/25/14
	4	Homogenization Blank	9/23/14													X	X		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		

12 into sample 14

Relinquished by: <u>[Signature]</u>	Date: <u>9/19/14</u>	Time: <u>1360</u>	Relinquished by: <u>[Signature]</u>	Date: <u>9/25/14</u>	Time: <u>14:30</u>
Received by: <u>Bob Kell</u>	Date: <u>9/26/14</u>	Time: <u>0945</u>	Received at BRL by: <u>[Signature]</u>	Date: <u>9/23/14</u>	Time: <u>0950</u>
Shipping carrier:	# of coolers:	BRL work order ID: <u>1432006</u>	BRL project ID: <u>CHARM-CH1410</u>		

* to be shipped 9/26 for 9/27 delivery -SED

061



PC Grindstat

Cooler Receipt and Preservation Form

Client / Project: Brooks Rand Labs Service Request K14 10497

Received: 9/26/14 Opened: 9/26/14 By: BK Unloaded: 9/26/14 By: BK

- 1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
- 2. Samples were received in: (circle) Cooler Box Envelope Other _____ NA
- 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
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
0.4				-3	335	NA	7712 8042 9507		

- 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves box
- 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 6. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
- 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N X
- 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- 11. Were VOA vials received without headspace? Indicate in the table below NA Y N
- 12. 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: X Missing sample "VW004-F507-0914"

ALS ENVIRONMENTAL

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue

Service Request No.: K1410499
Date Received: 09/26/14-09/27/14

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

Ten tissue samples were received for analysis at ALS Environmental between 09/26/14 and 09/27/14. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C and frozen at -20°C as required upon receipt at the laboratory.

Nitroaromatics and Nitramines by ALS SOP

Surrogate Exceptions:

The recovery of surrogate 1,3-Dinitrobenzene-C13 in sample VWW04-BAB01-0914 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

The recovery of surrogate C13-HMX in Batch QC Lab Control Sample KQ1412301-03, and Method Blank KQ1412301-04 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

Matrix Spike Recovery Exceptions:

The recovery of 2,4,6-Trinitrotoluene, and HMX in matrix spikes in sample VWW04-FS10-0914 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

Lab Control Sample Exceptions:

The recovery of HMX, and RDX in Lab Control Sample KQ1412301-03 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

The recovery of HMX in Lab Control Sample KQ1412507-01 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The data was flagged. No further corrective action was taken.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



Nitrophenols by ALS SOP

Matrix Spike Recovery Exceptions:

The matrix spike recovery for sample KQ1412304-01 was outside control criteria for Picric Acid Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential bias in this matrix. No further corrective action was appropriate.

Elevated Detection Limits:

The detection limit was elevated for Picric Acid in samples VWW04-CRB02-0914, VWW04-CRB03-0914, and VWW04-CRB04-0914. The analysis indicated the presence of non-target background components suppressing the instrument internal standard. The samples were diluted in order to achieve optimal resolution of the target analytes.

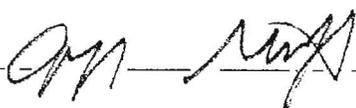
No other anomalies associated with the analysis of these samples were observed.

Lipids

The RPD on the triplicate analysis failed high at 47% (allowable <20%). The extracts were re-analyzed and produced similar results. The difference is likely due to homogenization limitations. The LCS with the batch was acceptable. The original results are reported.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____



BROOKS RAND LABS
SEA 716, WA

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 615-345-1115 • (fax) 615-646-5426

19292 K141044

Send Results to:		Send Invoice to:		Analysis Requirements:								Lab Use Only:									
Name <u>JULIANA DEAN</u>		Name <u>SAME</u>		BR-0106 Homogenize	EPA 1630 Melts	EPA 1631 Inerts AS	EPA 1631 As, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn	24, 6-TAT, HMX, Picric Acid, RDX	% LIPIDS EXT-LIPID	% Solids SM 2540								VOA Headspace	Y	N	NA
Company <u>CHAM HLL</u>		Company _____																Field Filtered	Y	N	NA
Address <u>5701 CLEVELAND ST. 570 300</u>		Address _____																Correct Containers	Y	N	NA
City <u>VIRGINIA BEACH</u>		City _____																Discrepancies	Y	N	NA
State, Zip <u>VA 23462</u>		State, Zip _____																Cust. Seals Intact	Y	N	NA
Phone <u>757-671-6232</u>		Phone _____																Containers Intact	Y	N	NA
Fax <u>757-497-6885</u>		Fax _____						Airbill #:	_____												
E-mail <u>JULIANA.DEAN@CHAM.COM</u>		E-mail _____						CAR #:	_____												
Project No./Name: <u>VIEQUES SWAMP TISSUE</u>		Sampler's (Signature): <u>John A. Martin</u>																			
Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix											Comments	No. of Bottles	Lab Use Only Containers/Pres.					
	9/18/14 1230	VWV04-CRB01-0914	TISSUE	X	X	X	X	X	X	X				1-CRAB							
	9/18/14 1235	VWV04-CRB02-0914	TISSUE	X	X	X	X	X	X	X				1-CRAB							
	9/18/14 1345	VWV04-CRB03-0914	TISSUE	X	X	X	X	X	X	X				1-CRAB							
	9/18/14 1350	VWV04-CRB04-0914	TISSUE	X	X	X	X	X	X	X				1-CRAB							
	9/18/14 1400	VWV04-BAB01-0914	TISSUE	X	X	X	X	X	X	X				1-CRAB							
	9/18/14 1230	VWV04-CRB01P-0914	TISSUE	X	X	X	X	X	X	X				1-CRAB SPAMSH BAIT-MACKEREL							
Sample Kit Prep'd by: (Signature)		Date/Time	Received By: (Signature)		REMARKS:								Details:								
Relinquished by: (Signature)		Date/Time	Received By: (Signature)										Page ____ of ____								
Relinquished by: (Signature)		Date/Time	Received By: (Signature)										Cooler No. ____ of ____								
Received for Laboratory by: (Signature)		Date/Time	Temperature										Date Shipped ____								
		9/23/14 0950			Shipped By ____																
		9/20/14	0.4C		Turnaround ____																

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

065



PC Gurndorf

Cooler Receipt and Preservation Form

Client / Project: Brooks Rand Labs Service Request K14 10499

Received: 9/26/14 Opened: 9/26/14 By: BK Unloaded: 9/26/14 By: BK

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

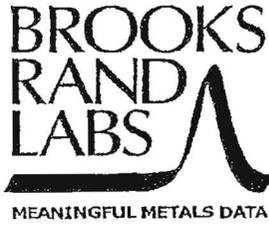
Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
0.4				-0.3	335		7712 8642 9507		

- 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves box
- 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 6. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
- 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
- 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- 11. Were VOA vials received without headspace? Indicate in the table below. NA Y N
- 12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



3958 6th Avenue NW
 Seattle, WA 98107
 Phone: 206-632-6206
 Fax: 206-632-6017

samples@brooksrand.com
 www.brooksrand.com

Chain of Custody Record

White: LAB COPY
 Yellow: CUSTOMER COPY

K1410499

Client: <u>JULIAN & PEARL</u>	Address: <u>STAMG</u>	COC receipt confirmation? Y / N
Contact: <u>CHAM HILL</u>		If so, by: email / fax (circle one)
Client project ID:	Phone #:	Email:
PO #:		Fax #:

Sample ID	Collection		Miscellaneous				Field Preservation			Analyses required							Comments	
	Date	Time	Sampler (initials)	Matrix type	# of containers	Field filtered? (Y/N)	Unpreserved / ice only	HCl / HNO ₃ (circle one)	Other (specify)	Total Hg, EPA 1631	Methyl Hg, EPA 1630	ICP-MS Metals (specify)	As / Se species (specify)	% Solids	Filtration	Other (specify) Explosives		Other (specify) % Lipids
1	VWV04-FS01-0914	9/19/14	0745	JRM	TS	1				X	X	X	X	X		X	X	
2	VWV04-FS01P-0914		0745	JRM		1				X	X	X	X	X		X	X	Field Dup
3	VWV04-FS02-0914		0800	JRM		1				X	X	X	X	X				
4	VWV04-FS03-0914		0805	JRM		1				X	X	X	X	X				
5	VWV04-FS04-0914		0815	JRM		1				X	X	X	X	X				
6	VWV04-FS05-0914		0825	JRM		1				X	X	X	X	X				
7	VWV04-FS06-0914		0830	JRM		1				X	X	X	X	X				
8	VWV04-FS07-0914		0835	JRM		1				X	X	X	X	X		X	X	
9	VWV04-FS08-0914		0840	JRM		1				X	X	X	X	X				
10	VWV04-FS09-0914		0850	JRM		1				X	X	X	X	X				

Relinquished by: <u>[Signature]</u>	Date: <u>9/19/14</u>	Time: <u>1300</u>	Relinquished by:	Date:	Time:
Received by:	Date:	Time:	Received at BRL by: <u>[Signature]</u>	Date: <u>9/23/14</u>	Time: <u>0950</u>
Shipping carrier:	# of coolers:	BRL work order ID: <u>1439006</u>	BRL project ID: <u>CHM-CH1401</u>		

[Signature] 9/26/14 11:00 [Signature] ALS 9/27/14 0930

067



3958 6th Avenue NW
 Seattle, WA 98107
 Phone: 206-632-6206
 Fax: 206-632-6017

samples@brooksrand.com
 www.brooksrand.com

MEANINGFUL METALS DATA

Chain of Custody Record

White: LAB COPY
 Yellow: CUSTOMER COPY

K1410499

Client: <u>JULIANA PEAN</u>	Address: <u>SAME</u>	COC receipt confirmation? Y / N
Contact: <u>CHARM HILL</u>		If so, by: email / fax (circle one)
Client project ID:	Phone #:	Email:
PO #:		Fax #:

Requested TAT in business days: <input type="checkbox"/> 20 (standard) <input type="checkbox"/> 15 <input type="checkbox"/> 10 <input type="checkbox"/> 5 <input type="checkbox"/> Other _____ <small>Surcharges apply for expedited turn around times.</small>	Collection		Miscellaneous				Field Preservation			Analyses required							Comments	
	Date	Time	Sampler (initials)	Matrix type	# of containers	Field filtered? (Y/N)	Unpreserved / ice only	HCl / HNO ₃ (circle one)	Other (specify)	Total Hg, EPA 1631	Methyl Hg, EPA 1630	ICP-MS Metals (specify)	As / Se species (specify)	% Solids	Filtration	Other (specify) Explosives		Other (specify) Volatiles
Sample ID																		
1	VWV04-FS10-0914	9/19/14 0900	JLP	TS	1				X	X	X	X	X			X	X	QC Sample
2	VWV04-FS10-0914	9/19/14 0900	JLP	TS	1				X	X	X	X	X					
3	VWV04-FS10-0914 SD	9/19/14 0900	JLP	TS	1				X	X	X	X	X					
4	Homog Blank - Fish															X	X	
5																		
6																		
7																		
8																		
9																		
10																		

see to sample

Relinquished by: <u>[Signature]</u>	Date: <u>9/19/14</u>	Time: <u>1360</u>	Relinquished by:	Date:	Time:
Received by:	Date:	Time:	Received at BRL by: <u>[Signature]</u>	Date: <u>9/23/14</u>	Time: <u>0150</u>
Shipping carrier:	# of coolers:	BRL work order ID: <u>1439006</u>	BRL project ID: <u>CHM-CH1401</u>		

[Signature] 9/26/14 11:00 [Signature] 9/27/14 0930

880



Cooler Receipt and Preservation Form

Client / Project: Brooks Rand Lab Service Request K14 10499

Received: 9/27/14 Opened: 9/27/14 By: BK Unloaded: 9/27/14 By: BK

- 1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
- 2. Samples were received in: (circle) Cooler Box Envelope Other _____ NA
- 3. 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
0	-1	—	—	-1	298	NA	7712 9531 1012		

- 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
- 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
- 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- 8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
- 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
- 11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
- 12. 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: _____

DataQual

Worksheets – Select Explosives

This SDG contains explosives analysis for select compounds via LC-MS by Lab SOP. Target compounds included HMX, RDX, 2,4,6-TNT & picric acid. The field samples in this SDG consist of fish and crab tissue. There is no current Region II validation SOP for the methods utilized for the samples in this SDG. Therefore, these worksheets are submitted and the laboratory SOP, project specific SAP and the DOD QSM Version 5.0 were used in the validation of these samples.

Holding Times

Sampling Date: 9/19 & 9/24-9/26

7 days from sampling (H₂O)

Received Date: 9/26-9/27 & 9/27

14 days from sampling (soil)

Extraction Dates: 10/2, 9/30

Analysis Dates: 10/21-10/24, 10/25-10/27, 10/30, 9/30-10/1

Sample receipt documentation was in order. All extraction and analysis holding time requirements were met for the water & tissue matrices. Cooler temps were within the acceptable range. The tissue samples were received frozen as required.

Calibrations

The samples in this SDG were analyzed according to SW-846 methods 8330B. Initial calibrations were performed with a standard curve for all target compounds. Curve calibration factors were calculated, linear regression or quadratic curves were plotted. %RSDs or correlation coefficients were within QC limits. Column resolution was good. Retention times were stable throughout the analytical sequence. The correct analytical sequence was run. Continuing calibration standards were analyzed per the method. Continuing calibration criteria were met. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample and the associated blank, must be qualified by elevating the limit of detection or adjusting the limit of detection to the sample result, when the sample concentration is less than five (5) times the blank concentration.
- Sample weight, volume or dilution factor must be taken into consideration when applying the 5X criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.

The associated blanks did not exhibit target compound contamination. Qualification was required in the samples. See tables for specific information.

Blank Contamination and Qualification Summaries

Blank ID	Compound	Concentration	Action Level	Q Flag

Sample ID	Compound	Q Flag	Q Code

SURROGATE RECOVERIES

All surrogate recovery criteria were met with the exception of C13-HMX in VWW04-FS02-0914 (65%) & 1, 3-DNB in VWW04-BAB01-0914 (68%). The reported results for HMX, RDX & 2,4,6-TNT were qualified as UJ in these two samples.

LABORATORY CONTROL SAMPLES

The solid LCS samples associated with the tissue matrix exhibited non-compliant recoveries below the QC limits for HMX and RDX in both SR#s. The two compounds were flagged as estimated biased low J-/UJ in all tissue samples. The LCS pairs associated with the homogenization blanks exhibited non-compliant recoveries below the QC limits

DataQual

Worksheets – Select Explosives

for HMX in one aliquot each. The compound HMX was flagged as estimated biased low J-/UJ in the associated blanks.

MATRIX SPIKE PAIR SUMMARY

The MS/MSD pair of sample VWW04-CRB10-0914 exhibited low recoveries for 2,4,6-TNT (68/63). The compound was flagged as estimated biased low J-/UJ in the native sample only as recommended by Region II. The MS/MSD pair of sample VWW04-FS10-0914 exhibited low recoveries for 2,4,6-TNT (68), HMX (66) and picric acid (55) in the MS aliquot. The compounds were flagged as estimated biased low J-/UJ in the native sample only as recommended by Region II.

FIELD DUPLICATE SAMPLE SUMMARY

Field duplicate samples were submitted in these SR#.s. Assessment of the field duplicate reproducibility is presented on the following page. If qualification of the results is required it is noted on this page.

SAMPLE RESULT VERIFICATION

There were no positive results reported in the field samples. Raw data was verified. Quantitation calculations were verified. Calculation examples were requested for the picric acid fraction. No additional qualifications were required.

Calc verification example was requested & received from lab JPC 12/15

Validator Signature *J Cleveland* Date 12/30/14

Jacqueline Cleveland

From: Jeff Grindstaff <Jeff.Grindstaff@alsglobal.com>
Sent: Monday, January 05, 2015 3:30 PM
To: Juliana.Dean@ch2m.com
Cc: cleve137@charter.net
Subject: RE: SWMU4 - one last question
Attachments: K1410497_MS_DMS_Calculation.xls

An example calculation is attached.

Regards,

Jeff Grindstaff

Laboratory Director
ALS Life Sciences Division
D +1 360 501 3283

From: Juliana.Dean@ch2m.com [<mailto:Juliana.Dean@ch2m.com>]
Sent: Monday, January 05, 2015 4:57 AM
To: Jeff Grindstaff
Cc: cleve137@charter.net
Subject: FW: SWMU4 - one last question

Hi Jeff,

Please see below for a question on SWMU 4 from the data validator. Could you help clarify the calculation for her?

Thanks so much,
Juliana

From: Jacqueline Cleveland [<mailto:cleve137@charter.net>]
Sent: Sunday, January 04, 2015 5:54 PM
To: Dean, Juliana/VBO
Subject: RE: SWMU4 - one last question

Hi Juliana,

The SOP didn't help to clear up the calculation issue. I was already performing the calc. as the SOP states so I am not sure what the issue is. I am trying to verify the MS/MSD results for the VWV04-CRB10-0914 in K1410497 and am unable. I don't know who to contact at the lab as I was unable to read the narrative signature. Will you forward this to them or send me the contact info?

Thanks,
Jackie

From: Juliana.Dean@ch2m.com [<mailto:Juliana.Dean@ch2m.com>]
Sent: Friday, January 02, 2015 7:38 AM

To: cleve137@charter.net
Subject: RE: SWMU4 - one last question

Hi Jackie,

Attached is the picric acid SOP – hopefully, that helps!

Thanks,
Juliana

From: Jacqueline Cleveland [<mailto:cleve137@charter.net>]
Sent: Wednesday, December 31, 2014 5:43 PM
To: Dean, Juliana/VBO
Subject: SWMU4 - one last question
Importance: High

Hi Juliana,

I am so sorry to ask this but I need the ALS SOP for the picric acid analysis. I am having difficulty with their sample calculation. They used a quadratic curve which in itself should not be a problem, but I cannot follow the calculation through to the final reported results. If you have the SOP will you send it over? Thanks so much!

Jackie

Jacqueline Cleveland
Vice-President
DataQual Environmental Services, LLC
636-352-9391 (cell)
cleve137@charter.net

ALS Group: Click [here](#) to report this email as spam.

The information contained in this email is confidential. If the reader is not the intended recipient then you must notify the sender immediately by return email and then delete all copies of this email. You must not copy, distribute, print or otherwise use the information. Email may be stored by the Company to support operational activities. All information will be held in accordance with the Company's Privacy Policy which can be found on the Company's website - www.alsglobal.com.

Calculator Check

Packhouse

ICPL 1/29/14 Instrument HPLC 2

IS 0181P

REF 0.2 ppb

$$\frac{(38787)(1)}{(191426)(0.2)} = 1.013$$

Lab Value - 1.013

%RSD =

$$\text{mean} = 1.074$$

GCV 1.00 ppb

9/30/14 10:27 pm

$$\frac{1.107}{1.085} = 1.017$$

%D

$$\frac{1.085 - 1.107}{1.085} = -2.03\%$$

Lab Value: 1.107 - 2% D

REF 215131(1)

194276(1)

$$= -2.03\%$$

Sample Code W1004-MW02-14C

Lab Value 13 ug/L

$$\text{NF ID } \frac{(274315)(1)(10)}{(193437)(1.085)} = 13.1 \text{ ug/L}$$

Explosives

LR curves plotted: Regression curves provided
 $y = 3.15 \times 10^5 x$
 2,4,6-TNT

LCS K0141299-03 1.000g → 10mL 10/21/14 4:44:26 am

$$\text{area} = 6719100 = \text{amt} = \frac{6719100}{3.15 \times 10^5} = 21.3 \text{ ug/mL} \cdot 10.0 \text{ mL} \cdot \frac{1.000 \text{ g}}{1000 \text{ g}}$$

1g 1g

$$\frac{1 \text{ ug}}{1000 \text{ g}} = 213 \text{ ug/kg}$$

	KQ1412302-01	KQ1412302-02
Percent solids:	28.2	
	MS	DMS
Freeze dried weight (g)	1.025	1.009
Calculated wet weight (g)	3.635	3.578
Final volume (mL)	10	10
Dillution Factor	10	10
Raw Concentration ng/mL	2.083	2.129
Sample result ug/Kg	57.3	59.5

calculations

Calculated wet weight = Freeze dried weight(g) / (Percent solids/100)

Sample result ug/Kg = (Raw Concentration (ng/mL) * Final volume(mL)) / Calculated wet weight (g) * Dillution factor

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue

Service Request: K1410497

SURROGATE RECOVERY SUMMARY
Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Extraction Method: ALS SOP

Sample Name	Lab Code	C13-HMX	1,3-Dinitrobenzene-C13
		70 - 130	70 - 130
VWW04-CRB05-0914	K1410497-001	103	115
VWW04-CRB06-0914	K1410497-002	93	104
VWW04-CRB07-0914	K1410497-003	93	108
VWW04-CRB08-0914	K1410497-004	107	105
VWW04-CRB09-0914	K1410497-005	95	88
VWW04-CRB10-0914	K1410497-006	85	97
VWW04-FS02-0914	K1410497-007	65 *	102 J7UJ
VWW04-FS03-0914	K1410497-008	73	101
VWW04-FS04-0914	K1410497-009	86	123
VWW04-FS05-0914	K1410497-010	84	121
VWW04-FS06-0914	K1410497-011	79	117
VWW04-FS08-0914	K1410497-012	79	125
VWW04-FS09-0914	K1410497-013	81	113
VWW04-CRB10-0914	KQ1412299-01	98	96
VWW04-CRB10-0914	KQ1412299-02	84	91
Lab Control Sample	KQ1412299-03	65 *	121 NQ
Method Blank	KQ1412299-04	73	112

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue

Service Request: K1410499

SURROGATE RECOVERY SUMMARY

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
Extraction Method: ALS SOP

Sample Name	Lab Code	C13-HMX	1,3-Dinitrobenzene-C13
		70 - 130	70 - 130
VWW04-CRB01-0914	K1410499-001	82	96
VWW04-CRB02-0914	K1410499-002	91	83
VWW04-CRB03-0914	K1410499-003	83	78
VWW04-CRB04-0914	K1410499-004	79	89
VWW04-BAB01-0914	K1410499-005	83	68 * <i>Flag J/UJ</i>
VWW04-CRB01P-0914	K1410499-006	81	87
VWW04-FS01-0914	K1410499-007	82	99
VWW04-FS01P-0914	K1410499-008	82	96
VWW04-FS07-0914	K1410499-009	87	94
VWW04-FS10-0914	K1410499-010	90	103
VWW04-FS10-0914	KQ1412301-01	80	91
VWW04-FS10-0914	KQ1412301-02	85	100
Lab Control Sample	KQ1412301-03	68 *	86
Method Blank	KQ1412301-04	65 * <i>NO</i>	96

ALS Group USA, Corp.
 dba ALS Environmental
 QA/QC Report

Client: CH2M Hill
 Project: Vieques West SWMU 4
 Sample Matrix: Tissue

Service Request: K1410497
 Date Analyzed: 10/21/14
 Date Extracted: 10/02/14

Lab Control Sample Summary
 Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
 Prep Method: ALS SOP

Units: ug/Kg
 Basis: Wet
 Analysis Lot: 417168

Lab Control Sample
 KQ1412299-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4,6-Trinitrotoluene (TNT)	213	250	85	70-130
HMX	145	250	58*	70-130
RDX	165	250	66*	70-130

J-14J
 ↓

Flag in all tissue samples associated

ALS Group USA, Corp.
 dba ALS Environmental
 QA/QC Report

Client: CH2M Hill
 Project: Vieques West SWMU 4
 Sample Matrix: Tissue

Service Request: K1410499
 Date Analyzed: 10/21/14
 Date Extracted: 10/02/14

Lab Control Sample Summary
 Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
 Prep Method: ALS SOP

Units: ug/Kg
 Basis: Wet
 Analysis Lot: 417168

Lab Control Sample
 KQ1412301-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4,6-Trinitrotoluene (TNT)	35.9	50.0	72	70-130
HMX	27.5	50.0	55 *	70-130
RDX	29.4	50.0	59 *	70-130

J-10J
 ↓

Flag in all tissue samples associated

ALS Group USA, Corp.
 dba ALS Environmental
 QA/QC Report

Client: CH2M Hill
 Project: Vieques West SWMU 4
 Sample Matrix: Ground Water

Service Request: K1410497
 Date Analyzed: 10/20/14 - 10/21/14
 Date Extracted: 10/07/14

Duplicate Lab Control Sample Summary
 Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
 Prep Method: ALS SOP

Units: ug/L
 Basis: NA
 Analysis Lot: 417168

Analyte Name	Lab Control Sample KQ1412507-01			Duplicate Lab Control Sample KQ1412507-02			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,4,6-Trinitrotoluene (TNT)	35.2	50.0	70	35.7	50.0	71	70-130	1	30
HMX	34.2	50.0	68 *	35.3 J/W	50.0	71	70-130	3	30
RDX	41.6	50.0	83	40.1	50.0	80	70-130	4	30

Flag in all liquid samples associated

ALS Group USA, Corp.
 dba ALS Environmental
 QA/QC Report

Client: CH2M Hill
 Project: Vieques West SWMU 4
 Sample Matrix: Water

Service Request: K1410499
 Date Analyzed: 10/20/14 - 10/21/14
 Date Extracted: 10/07/14

Duplicate Lab Control Sample Summary
 Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Analysis Method: ALS SOP
 Prep Method: ALS SOP

Units: ug/L
 Basis: NA
 Analysis Lot: 417168

Lab Control Sample
 KQ1412507-01

Duplicate Lab Control Sample
 KQ1412507-02

Analyte Name	Lab Control Sample			Duplicate Lab Control Sample			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,4,6-Trinitrotoluene (TNT)	35.2	50.0	70	35.7	50.0	71	70-130	1	30
HMX	34.2	50.0	68 *	35.3	50.0	71	70-130	3	30
RDX	41.6	50.0	83	40.1	50.0	80	70-130	4	30

flag in all liquid samples associated

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: CH2M Hill
Project: Vieques West SWMU 4
Sample Matrix: Tissue

Service Request: K1410497
Date Collected: 09/19/14
Date Received: 09/26/14
Date Analyzed: 10/23/14
Date Extracted: 10/2/14

Duplicate Matrix Spike Summary
Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Sample Name: VWW04-CRB10-0914
Lab Code: K1410497-006
Analysis Method: ALS SOP
Prep Method: ALS SOP

Units: ug/Kg
Basis: Wet

Analyte Name	Sample Result	Matrix Spike KQ1412299-01			Duplicate Matrix Spike KQ1412299-02			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,4,6-Trinitrotoluene (TNT)	ND U	47.4	69.7	68 *	42.3	66.8	63 *	70-130	11	40
HMX	ND U	50.1	69.7	72	46.9	66.8	70	70-130	7	40
RDX	ND U	56.8	69.7	81	50.0	66.8	75	70-130	13	40

Flag in native sample only

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: CH2M Hill
 Project: Vieques West SWMU 4
 Sample Matrix: Tissue

Service Request: K1410499
 Date Collected: 09/19/14
 Date Received: 09/27/14
 Date Analyzed: 10/24/14
 Date Extracted: 10/2/14

Duplicate Matrix Spike Summary

Nitroaromatics and Nitramines by Liquid Chromatography and Tandem Mass Spectrometry

Sample Name: VWW04-FS10-0914
 Lab Code: K1410499-010
 Analysis Method: ALS SOP
 Prep Method: ALS SOP

Units: ug/Kg
 Basis: Wet

Analyte Name	Sample Result	Result	Matrix Spike KQ1412301-01		Duplicate Matrix Spike KQ1412301-02			% Rec Limits	RPD	RPD Limit
			Spike Amount	% Rec	Result	Spike Amount	% Rec			
2,4,6-Trinitrotoluene (TNT)	ND U	48.4	71.1	68 *	60.4	79.2	76	70-130	22	40
HMX	ND U	46.8	71.1	66 *	60.7	79.2	77	70-130	26	40
RDX	ND U	52.0	71.1	73	63.6	79.2	80	70-130	20	40

Flag in native sample only

J-uJ
↓

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.