



LABORATORY DATA CONSULTANTS, INC.

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GSI Pacific, Inc.
181 S. Kukui Street
Honolulu, HI 96813
ATTN: Ms. Sonia Shjegstad

June 23, 2014

SUBJECT: Revised Makua Military Reservation, Oahu, HI, Data Validation

Dear Ms. Shjegstad

Enclosed are the revised validation reports for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

LDC Project #31702:

SDG #

10258392, 10260486

Fraction

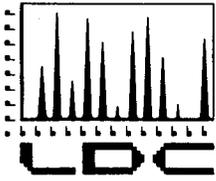
Dioxins/Dibenzofurans

- Ammended Dioxin/Dibenzofuran data qualification due to method blank contamination.

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

Sincerely,

Andrew Kong
Project Manager/Senior Chemist



LABORATORY DATA CONSULTANTS, INC.

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GSI Pacific, Inc.
181 S. Kukui Street
Honolulu, HI 96813
ATTN: Ms. Sonia Shjegstad

May 7, 2014

SUBJECT: Makua Military Reservation, Oahu, HI, Data Validation

Dear Ms. Shjegstad

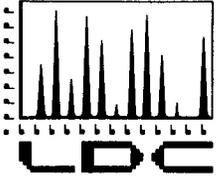
Enclosed are the final validation reports for the fractions listed below. These SDGs were received on April 21, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #31702:

<u>SDG #</u>	<u>Fraction</u>
006611, 006612	Semivolatiles, Chlorinated Pesticides, Explosives, Dioxins/Dibenzofurans, Perchlorate, Metals
006613, 006615	
006616/006617	
10258392, 10260486	
1408020, 1411043	
320-6575-1	

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

- Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii, August 2013
- Final Draft Version of the U.S. Department of Defense, DoD, and Department of Energy, DoE, Consolidated Quality Systems Manual, QSM, for Environmental Laboratories, Version 5.0, March 2013
- USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins and Chlorinated Dibenzofurans Data Review, September 2011
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010



- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Andrew Kong
Project Manager/Senior Chemist

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13, 2014
LDC Report Date: April 29, 2014
Matrix: Tissue
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006611

Sample Identification

MAK101O
MAK102O
MAK103O
MAK104O
MAK105O
MAK106O
MAK107O
MAK108O
MAK104OMS
MAK104OMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/7/14	Di-n-butylphthalate	15.44	All samples in SDG 006611	J (all detects) UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

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

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Semivolatiles - Data Qualification Summary - SDG 006611**

SDG	Sample	Compound	Flag	A or P	Reason
006611	MAK101O MAK102O MAK103O MAK104O MAK105O MAK106O MAK107O MAK108O	Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)

**Makua Military Reservation
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 006611**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Semivolatiles - Field Blank Data Qualification Summary - SDG 006611**

No Sample Data Qualified in this SDG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>1/13/14</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	<u>? RSD ≤ 15?</u>
IV.	Continuing calibration/ICV	A	<u>CCV/ICV ≤ 20?</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples: Tissue

1	MAK101O	11	<u>BLANK B10161</u>	21	31
2	MAK102O	12		22	32
3	MAK103O	13		23	33
4	MAK104O	14		24	34
5	MAK105O	15		25	35
6	MAK106O	16		26	36
7	MAK107O	17		27	37
8	MAK108O	18		28	38
9	MAK104OMS	19		29	39
10	MAK104OMSD	20		30	40

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU. Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV. Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW. Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Makua Military Reservation

Collection Date: January 13, 2014

LDC Report Date: April 29, 2014

Matrix: Tissue

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: ARDL, Inc.

Sample Delivery Group (SDG): 006611

Sample Identification

MAK101O
MAK102O
MAK103O
MAK104O
MAK105O
MAK106O
MAK107O
MAK108O
MAK104OMS
MAK104OMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081B for Chlorinated Pesticides.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

III. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
MAK103O	Not specified	Decachlorobiphenyl	131 (25-125)	All TCL compounds	J (all detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Florisil Cartridge Check

Florisil cleanup was not reviewed in this SDG.

XI. GPC Calibration

GPC cleanup was not reviewed in this SDG.

XII. Target Compound Identification

Raw data were not reviewed for this SDG.

XIII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XV. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Chlorinated Pesticides - Data Qualification Summary - SDG 006611**

SDG	Sample	Compound	Flag	A or P	Reason
006611	MAK103O	All TCL compounds	J (all detects)	P	Surrogate spikes (%R)

**Makua Military Reservation
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG
006611**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 006611**

No Sample Data Qualified in this SDG

LDC #: 31702A3a

VALIDATION COMPLETENESS WORKSHEET

Date: 4/29/14

SDG #: 006611

Level III

Page: 1 of 1

Laboratory: ARDL, Inc.

Reviewer: JVG

2nd Reviewer: 

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13/14
II.	GC Instrument Performance Check	A	
III.	Initial calibration	A	% RSD ≤ 20%
IV.	Continuing calibration/ICV	A	CV/ICV ≤ 20%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
X.	Florisil cartridge check	N	
XI.	GPC Calibration	N	
XII.	Target compound identification	N	
XIII.	Compound quantitation/RL/LOQ/LODs	N	
XIV.	Overall assessment of data	A	
XV.	Field duplicates	N	
XVI.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

W Tissue

1	MAK101O	11	BK B10162	21	31
2	MAK102O	12		22	32
3	MAK103O	13		23	33
4	MAK104O	14		24	34
5	MAK105O	15		25	35
6	MAK106O	16		26	36
7	MAK107O	17		27	37
8	MAK108O	18		28	38
9	MAK104OMS	19		29	39
10	MAK104OMSD	20		30	40

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Makua Military Reservation

Collection Date: January 13, 2014

LDC Report Date: April 30, 2014

Matrix: Tissue

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: ARDL, Inc.

Sample Delivery Group (SDG): 006611

Sample Identification

MAK101O
MAK102O
MAK103O
MAK104O
MAK105O
MAK106O
MAK107O
MAK108O
MAK104OMS
MAK104OMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330A for Explosives.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

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

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

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

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Explosives - Data Qualification Summary - SDG 006611**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Explosives - Laboratory Blank Data Qualification Summary - SDG 006611**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Explosives - Field Blank Data Qualification Summary - SDG 006611**

No Sample Data Qualified in this SDG

LDC #: 31702A40
 SDG #: 006611
 Laboratory: ARDL, Inc.

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 4/29/14
 Page: 1 of 1
 Reviewer: *[Signature]*
 2nd Reviewer: *[Signature]*

METHOD: HPLC Explosives (EPA SW 846 Method 8330A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13/14
II.	Initial calibration	A	r ²
III.	Calibration verification/ICV	A	COV/W ≤ 20%
IV.	Blanks	A	
V.	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

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

Validated Samples:

Tissue

1	MAK1010	11	Bik B10170	21		31	
2	MAK1020	12		22		32	
3	MAK1030	13		23		33	
4	MAK1040	14		24		34	
5	MAK1050	15		25		35	
6	MAK1060	16		26		36	
7	MAK1070	17		27		37	
8	MAK1080	18		28		38	
9	MAK104OMS	19		29		39	
10	MAK104OMSD	20		30		40	

Notes: B, J, O

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: April 29, 2014
Matrix: Tissue
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006612

Sample Identification

MAK102C
MAK103C
MAK104C
MAK105C
MAK106C
MAK107C
MAK108C
MAK110C
MAK110CMS
MAK110CMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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Raw data were not reviewed for this SDG. The review was based on QC data.

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- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/7/14	Di-n-butylphthalate	15.44	All samples in SDG 006612	J (all detects) UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

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

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Semivolatiles - Data Qualification Summary - SDG 006612**

SDG	Sample	Compound	Flag	A or P	Reason
006612	MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C	Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)

**Makua Military Reservation
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 006612**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Semivolatiles - Field Blank Data Qualification Summary - SDG 006612**

No Sample Data Qualified in this SDG

LDC #: 31702B2a
 SDG #: 006612
 Laboratory: ARDL, Inc.

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 4/29/14
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: E

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13 - 14/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	% RSD ≤ 15%
IV.	Continuing calibration/ICV	A	COV/ICV ≤ 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples: Tissue

1	MAK102C	11	BLK B10169	21	31
2	MAK103C	12		22	32
3	MAK104C	13		23	33
4	MAK105C	14		24	34
5	MAK106C	15		25	35
6	MAK107C	16		26	36
7	MAK108C	17		27	37
8	MAK110C	18		28	38
9	MAK110CMS	19		29	39
10	MAK110CMSD	20		30	40

Phthalates + Pyrene

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU. Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV. Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW. Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: April 29, 2014
Matrix: Tissue
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006612

Sample Identification

MAK102C
MAK103C
MAK104C
MAK105C
MAK106C
MAK107C
MAK108C
MAK110C
MAK110CMS
MAK110CMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081B for Chlorinated Pesticides.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

III. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%RSD	Associated Samples	Flag	A or P
3/14/14	ICAL-HP2	STX-CLP2	4,4'-DDT	20.593	All samples in SDG 006612	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Florisil Cartridge Check

Florisil cleanup was not reviewed in this SDG.

XI. GPC Calibration

GPC cleanup was not reviewed in this SDG.

XII. Target Compound Identification

Raw data were not reviewed for this SDG.

XIII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XV. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Chlorinated Pesticides - Data Qualification Summary - SDG 006612**

SDG	Sample	Compound	Flag	A or P	Reason
006612	MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C	4,4'-DDT	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)

**Makua Military Reservation
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG
006612**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 006612**

No Sample Data Qualified in this SDG

LDC #: 31702B3a

VALIDATION COMPLETENESS WORKSHEET

Date: 4/29/14

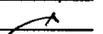
SDG #: 006612

Level III

Page: 1 of 1

Laboratory: ARDL, Inc.

Reviewer: JVG

2nd Reviewer: **METHOD:** GC Chlorinated Pesticides (EPA SW 846 Method 8081B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13 - 14/14
II.	GC Instrument Performance Check	A	
III.	Initial calibration	SW	% RSD \leq 20%
IV.	Continuing calibration/ICV	A	CCV/ICV \leq 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
X.	Florisil cartridge check	N	
XI.	GPC Calibration	N	
XII.	Target compound identification	N	
XIII.	Compound quantitation/RL/LOQ/LODs	N	
XIV.	Overall assessment of data	A	
XV.	Field duplicates	N	
XVI.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Tissue

1	MAK102C	11		21		31	
2	MAK103C	12		22		32	
3	MAK104C	13		23		33	
4	MAK105C	14		24		34	
5	MAK106C	15		25		35	
6	MAK107C	16		26		36	
7	MAK108C	17		27		37	
8	MAK110C	18		28		38	
9	MAK110CMS	19		29		39	
10	MAK110CMSD	20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: April 30, 2014
Matrix: Tissue
Parameters: Explosives
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006612

Sample Identification

MAK102C
MAK103C
MAK104C
MAK105C
MAK106C
MAK107C
MAK108C
MAK110C
MAK110CMS
MAK110CMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330A for Explosives.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

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

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

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

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Explosives - Data Qualification Summary - SDG 006612**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Explosives - Laboratory Blank Data Qualification Summary - SDG 006612**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Explosives - Field Blank Data Qualification Summary - SDG 006612**

No Sample Data Qualified in this SDG

LDC #: 31702B40
 SDG #: 006612
 Laboratory: ARDL, Inc.

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 4/29/14
 Page: 1 of 1
 Reviewer: JVC
 2nd Reviewer: [Signature]

METHOD: HPLC Explosives (EPA SW 846 Method 8330A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13 - 14/14
II	Initial calibration	A	21 r2
III.	Calibration verification/ICV	A	CCV/ICV ≤ 20%
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

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

Validated Samples:

Tissue

1	MAK102C	11	BLANK B10170	21		31	
2	MAK103C	12		22		32	
3	MAK104C	13		23		33	
4	MAK105C	14		24		34	
5	MAK106C	15		25		35	
6	MAK107C	16		26		36	
7	MAK108C	17		27		37	
8	MAK110C	18		28		38	
9	MAK110CMS	19		29		39	
10	MAK110CMSD	20		30		40	

Notes: 24-DNT, NG, RDX

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: May 5, 2014
Matrix: Tissue
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006613

Sample Identification

MAK101L
MAK102L
MAK105L
MAK106L
MAK108, 109, 110, 113L
MAK111L
MAK112L
MAK115L
MAK101LMS
MAK101LMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/7/14	Di-n-butylphthalate	15.44	All samples in SDG 006613	J (all detects) UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

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

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Semivolatiles - Data Qualification Summary - SDG 006613**

SDG	Sample	Compound	Flag	A or P	Reason
006613	MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L	Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)

**Makua Military Reservation
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 006613**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Semivolatiles - Field Blank Data Qualification Summary - SDG 006613**

No Sample Data Qualified in this SDG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>1/13 - 14 / 14</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	<u>% RSD < 15%</u>
IV.	Continuing calibration/ICV	A	<u>CCV/ICV < 20%</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	<u>SWA</u>	<u>(No asstd cpd NB)</u>
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples: tissue

1	MAK101L	11	<u>BLANK B10107</u>	21		31	
2	MAK102L	12		22		32	
3	MAK105L	13		23		33	
4	MAK106L	14		24		34	
5	MAK108/109/110/113L	15		25		35	
6	MAK111L	16		26		36	
7	MAK112L	17		27		37	
8	MAK115L	18		28		38	
9	MAK101LMS	19		29		39	
10	MAK101LMSD	20		30		40	

phthalates + Pyrene

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU. Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV. Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW. Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: May 5, 2014
Matrix: Tissue
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006613

Sample Identification

MAK101L
MAK102L
MAK105L
MAK106L
MAK108, 109, 110, 113L
MAK111L
MAK112L
MAK115L
MAK101LMS
MAK101LMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081B for Chlorinated Pesticides.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

III. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%RSD	Associated Samples	Flag	A or P
3/14/14	ICAL-HP2	STX-CLP2	4,4'-DDT	20.593	All samples in SDG 006613	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
MAK105L	STX-CLP2	Tetrachloro-m-xylene	21 (25-125)	All TCL compounds	J (all detects) UJ (all non-detects)	P
MAK106L	STX-CLP2	Tetrachloro-m-xylene	15 (25-125)	All TCL compounds	J (all detects) UJ (all non-detects)	P
MAK108, 109, 110, 113L	STX-CLP2	Tetrachloro-m-xylene	23 (25-125)	All TCL compounds	J (all detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MAK101LMS/MSD (MAK101L)	alpha-BHC Heptachlor beta-BHC	177 (45-113) 293.9 (52-114) 129.6 (50-111)	218.8 (45-113) 203.8 (52-114) -	- 36.4 (≤25) 53.2 (≤25)	J (all detects) J (all detects) J (all detects)	A
MAK101LMS/MSD (MAK101L)	gamma-BHC delta-BHC Aldrin 4,4'-DDT	- 45.3 (48-118) 28.8 (51-111) 50.7 (55-122)	43.9 (51-112) 40.3 (48-118) 29.8 (51-111) 36.4 (55-122)	28.4 (≤25) - - 33 (≤25)	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Florisil Cartridge Check

Florisil cleanup was not reviewed in this SDG.

XI. GPC Calibration

GPC cleanup was not reviewed in this SDG.

XII. Target Compound Identification

Raw data were not reviewed for this SDG.

XIII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XV. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Chlorinated Pesticides - Data Qualification Summary - SDG 006613**

SDG	Sample	Compound	Flag	A or P	Reason
006613	MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L	4,4'-DDT	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
006613	MAK105L MAK106L MAK108, 109, 110, 113L	All TCL compounds	J (all detects) UJ (all non-detects)	P	Surrogate spikes (%R)
006613	MAK101L	alpha-BHC	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
006613	MAK101L	Heptachlor beta-BHC	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)(RPD)
006613	MAK101L	delta-BHC Aldrin	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
006613	MAK101L	gamma-BHC 4,4'-DDT	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)(RPD)

**Makua Military Reservation
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG
006613**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 006613**

No Sample Data Qualified in this SDG

LDC #: 31702C3a

VALIDATION COMPLETENESS WORKSHEET

SDG #: 006613

Level III

Laboratory: ARDL, Inc.

Date: 4/29/14

Page: 1 of 1

Reviewer: JVG

2nd Reviewer:

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13-14/14
II.	GC Instrument Performance Check	A	
III.	Initial calibration	SW	? RSD \leq 20%
IV.	Continuing calibration/ICV	A	CV/ICV \leq 20%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
X.	Florisil cartridge check	N	
XI.	GPC Calibration	N	
XII.	Target compound identification	N	
XIII.	Compound quantitation/RL/LOQ/LODs	N	
XIV.	Overall assessment of data	A	
XV.	Field duplicates	N	
XVI.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Tissue

1	MAK101L	T1	BLANK B10166	21		31	
2	MAK102L	12		22		32	
3	MAK105L	13		23		33	
4	MAK106L	14		24		34	
5	MAK108/109/110/113L	15		25		35	
6	MAK111L	16		26		36	
7	MAK112L	17		27		37	
8	MAK115L	18		28		38	
9	MAK101LMS	19		29		39	
10	MAK101LMSD	20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: May 5, 2014
Matrix: Tissue
Parameters: Explosives
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006613

Sample Identification

MAK101L
MAK102L
MAK105L
MAK106L
MAK108,109,110,113L
MAK111L
MAK112L
MAK115L
MAK101LMS
MAK101LMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330A for Explosives.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

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

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

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

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Explosives - Data Qualification Summary - SDG 006613**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Explosives - Laboratory Blank Data Qualification Summary - SDG 006613**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Explosives - Field Blank Data Qualification Summary - SDG 006613**

No Sample Data Qualified in this SDG

LDC #: 31702C40
 SDG #: 006613
 Laboratory: ARDL, Inc.

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 4/29/14
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: HPLC Explosives (EPA SW 846 Method 8330A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13-14/14
II.	Initial calibration	A	r2
III.	Calibration verification/ICV	A	CV/1CV ≤ 20%
IV.	Blanks	A	
V.	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

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

Validated Samples:

Tissue

1	MAK101L	11	BLANK B10173	21		31	
2	MAK102L	12		22		32	
3	MAK105L	13		23		33	
4	MAK106L	14		24		34	
5	MAK108/109/110/113L	15		25		35	
6	MAK111L	16		26		36	
7	MAK112L	17		27		37	
8	MAK115L	18		28		38	
9	MAK101LMS	19		29		39	
10	MAK101LMSD	20		30		40	

Notes: RDX NG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 31 through February 11, 2014
LDC Report Date: April 29, 2014
Matrix: Tissue
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006615

Sample Identification

MAK111C
MAK113C
MAK114C
MAK115C
MAK116C
MAK117C
MAK118C
MAK120C
MAK116CMS
MAK116CMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/7/14	Di-n-butylphthalate	15.44	All samples in SDG 006615	J (all detects) UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

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

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Semivolatiles - Data Qualification Summary - SDG 006615**

SDG	Sample	Compound	Flag	A or P	Reason
006615	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C	Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)

**Makua Military Reservation
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 006615**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Semivolatiles - Field Blank Data Qualification Summary - SDG 006615**

No Sample Data Qualified in this SDG

LDC #: 31702D2a
 SDG #: 006615
 Laboratory: ARDL, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 4/20/14
 Page: 1 of 1
 Reviewer: JVL
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>1/31/14 - 2/11/14</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	<u>% RSD ≤ 15%</u>
IV.	Continuing calibration/ICV	A	<u>CV/ICV ≤ 20%</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:

Tissue

1	MAK111C	T1	BLANK B10174	21		31	
2	MAK113C	12		22		32	
3	MAK114C	13		23		33	
4	MAK115C	14		24		34	
5	MAK116C	15		25		35	
6	MAK117C	16		26		36	
7	MAK118C	17		27		37	
8	MAK120C	18		28		38	
9	MAK116CMS	19		29		39	
10	MAK116CMSD	20		30		40	

Phthalates + Pyrene

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU. Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV. Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW. Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Makua Military Reservation
Collection Date: January 31 through February 11, 2014
LDC Report Date: April 29, 2014
Matrix: Tissue
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: ARDL, Inc.
Sample Delivery Group (SDG): 006616/006617

Sample Identification

MAK120L
MAK121L
MAK122L
MAK123L
MAK124L
MAK126L
MAK127L
MAK128L
MAK116L
MAK117L
MAK118L
MAK123LMS
MAK123LMSD

Introduction

This data review covers 13 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/7/14	Di-n-butylphthalate	15.44	All samples in SDG 006616/006617	J (all detects) UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

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

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MAK123LMS/MSD (MAK123L)	Diethylphthalate	36.5 (57-112)	28.4 (57-112)	-	J (all detects) UJ (all non-detects)	A
	Di-n-butylphthalate	-	48.9 (54-118)	-	J (all detects) UJ (all non-detects)	

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Semivolatiles - Data Qualification Summary - SDG 006616/006617**

SDG	Sample	Compound	Flag	A or P	Reason
006616/ 006617	MAK120L MAK121L MAK122L MAK123L MAK124L MAK126L MAK127L MAK128L MAK116L MAK117L MAK118L	Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
006616/ 006617	MAK123L	Diethylphthalate Di-n-butylphthalate	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

**Makua Military Reservation
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG
006616/006617**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Semivolatiles - Field Blank Data Qualification Summary - SDG 006616/006617**

No Sample Data Qualified in this SDG

LDC #: 31702E2a

VALIDATION COMPLETENESS WORKSHEET

Date: 4/29/14

SDG #: 006616/006617

Level III

Page: 1 of 1

Laboratory: ARDL, Inc.

Reviewer: JVG

2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/31/14 - 2/11/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	2 RSD \leq 15%
IV.	Continuing calibration/ICV	A	COV/ICV \leq 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Tissue

1	MAK120L	11	MAK118L	21	BLANK B10179	31	
2	MAK121L	12	MAK123LMS	22	SPBK B10179	32	
3	MAK122L	13	MAK123LMSD	23		33	
4	MAK123L	14		24		34	
5	MAK124L	15		25		35	
6	MAK126L	16		26		36	
7	MAK127L	17		27		37	
8	MAK128L	18		28		38	
9	MAK116L	19		29		39	
10	MAK117L	20		30		40	

Phthalates + Pyrene

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU. Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV. Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW. Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: June 9, 2014
Matrix: Tissue
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III
Laboratory: Pace Analytical Services, Inc.
Sample Delivery Group (SDG): 10258392

Sample Identification

MAK101O	MAK108, 109, 110, 113L
MAK102O	MAK111L
MAK103O	MAK112L
MAK104O	MAK115L
MAK105O	
MAK106O	
MAK107O	
MAK108O	
MAK102C	
MAK103C	
MAK104C	
MAK105C	
MAK106C	
MAK107C	
MAK108C	
MAK110C	
MAK101L	
MAK102L	
MAK105L	
MAK106L	

Introduction

This data review covers 24 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
BLANK-39430	2/25/14	2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.24 ng/Kg 0.18 ng/Kg 0.32 ng/Kg 0.26 ng/Kg 0.58 ng/Kg 0.32 ng/Kg 0.94 ng/Kg 1.30 ng/Kg	MAK101O MAK102O MAK103O MAK104O MAK105O MAK106O MAK107O MAK108O
BLANK-39500	3/4/14	2,3,7,8-TCDF Total TCDF Total PeCDF OCDD	0.084 ng/Kg 0.230 ng/Kg 0.036 ng/Kg 0.11 ng/Kg	MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L

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

Sample	Compound	Reported Concentration	Modified Final Concentration
MAK101O	2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.037 ng/Kg 0.045 ng/Kg 0.057 ng/Kg 0.100 ng/Kg 0.093 ng/Kg 0.170 ng/Kg 0.300 ng/Kg	0.037U ng/Kg 0.045U ng/Kg 0.057U ng/Kg 0.100J ng/Kg 0.093U ng/Kg 0.170U ng/Kg 0.300U ng/Kg
MAK102O	1,2,3,4,6,7,8-HpCDD OCDD	0.100 ng/Kg 0.270 ng/Kg	0.100U ng/Kg 0.270U ng/Kg
MAK103O	1,2,3,4,6,7,8-HpCDD OCDD	0.068 ng/Kg 0.280 ng/Kg	0.068U ng/Kg 0.280U ng/Kg
MAK104O	1,2,3,4,6,7,8-HpCDD OCDD	0.070 ng/Kg 0.400 ng/Kg	0.070U ng/Kg 0.400U ng/Kg
MAK105O	1,2,3,4,6,7,8-HpCDD OCDD	0.069 ng/Kg 0.310 ng/Kg	0.069U ng/Kg 0.310U ng/Kg
MAK106O	1,2,3,4,6,7,8-HpCDD OCDD	0.092 ng/Kg 0.280 ng/Kg	0.092U ng/Kg 0.280U ng/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
MAK108O	1,2,3,4,6,7,8-HpCDD OCDD	0.086 ng/Kg 0.330 ng/Kg	0.086U ng/Kg 0.330U ng/Kg
MAK102C	2,3,7,8-TCDF Total TCDF OCDD	0.063 ng/Kg 0.093 ng/Kg 0.400 ng/Kg	0.063U ng/Kg 0.093J ng/Kg 0.400U ng/Kg
MAK103C	2,3,7,8-TCDF Total TCDF	0.072 ng/Kg 0.140 ng/Kg	0.072U ng/Kg 0.140J ng/Kg
MAK104C	2,3,7,8-TCDF Total TCDF OCDD	0.11 ng/Kg 0.11 ng/Kg 0.29 ng/Kg	0.11U ng/Kg 0.11J ng/Kg 0.29U ng/Kg
MAK105C	2,3,7,8-TCDF Total TCDF OCDD	0.052 ng/Kg 0.062 ng/Kg 0.220 ng/Kg	0.052U ng/Kg 0.062J ng/Kg 0.220U ng/Kg
MAK106C	2,3,7,8-TCDF Total TCDF OCDD	0.070 ng/Kg 0.140 ng/Kg 0.370 ng/Kg	0.070U ng/Kg 0.140J ng/Kg 0.370U ng/Kg
MAK107C	2,3,7,8-TCDF OCDD	0.054 ng/Kg 0.230 ng/Kg	0.054U ng/Kg 0.230U ng/Kg
MAK108C	2,3,7,8-TCDF Total TCDF	0.072 ng/Kg 0.062 ng/Kg	0.072U ng/Kg 0.062J ng/Kg
MAK110C	2,3,7,8-TCDF	0.078 ng/Kg	0.078U ng/Kg
MAK101L	OCDD	0.510 ng/Kg	0.510U ng/Kg
MAK102L	2,3,7,8-TCDF	0.067 ng/Kg	0.067U ng/Kg
MAK105L	OCDD	0.360 ng/Kg	0.360U ng/Kg
MAK106L	OCDD	0.250 ng/Kg	0.250U ng/Kg
MAK112L	OCDD	0.440 ng/Kg	0.440U ng/Kg
MAK115L	OCDD	0.400 ng/Kg	0.400U ng/Kg

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

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

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries (%R) were within QC limits.

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
MAK101O MAK102O MAK103O MAK106O	All compounds flagged "P" due to DiPhenylEther interference	J (all detects)	P

The 2,3,7,8-TCDF confirmation was performed with the following exceptions:

Sample	Compound	Finding	Criteria
MAK101O MAK102O MAK103O MAK104O MAK105O MAK106O MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C MAK102L	2,3,7,8-TCDF	2nd column confirmation was not performed for this compound.	2,3,7,8-TCDF must be confirmed on the 2nd column per the method.

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Dioxins/Dibenzofurans - Data Qualification Summary - SDG 10258392**

SDG	Sample	Compound	Flag	A or P	Reason
10258392	MAK101O MAK102O MAK103O MAK106O	All compounds flagged "P" due to DiPhenylEther interference	J (all detects)	P	Compound quantitation

**Makua Military Reservation
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG
10258392**

SDG	Sample	Compound	Modified Final Concentration	A or P
10258392	MAK101O	2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF Total HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.037U ng/Kg 0.045U ng/Kg 0.057U ng/Kg 0.100J ng/Kg 0.093U ng/Kg 0.170U ng/Kg 0.300U ng/Kg	A
10258392	MAK102O	1,2,3,4,6,7,8-HpCDD OCDD	0.100U ng/Kg 0.270U ng/Kg	A
10258392	MAK103O	1,2,3,4,6,7,8-HpCDD OCDD	0.068U ng/Kg 0.280U ng/Kg	A
10258392	MAK104O	1,2,3,4,6,7,8-HpCDD OCDD	0.070U ng/Kg 0.400U ng/Kg	A
10258392	MAK105O	1,2,3,4,6,7,8-HpCDD OCDD	0.069U ng/Kg 0.310U ng/Kg	A
10258392	MAK106O	1,2,3,4,6,7,8-HpCDD OCDD	0.092U ng/Kg 0.280U ng/Kg	A
10258392	MAK108O	1,2,3,4,6,7,8-HpCDD OCDD	0.086U ng/Kg 0.330U ng/Kg	A
10258392	MAK102C	2,3,7,8-TCDF Total TCDF OCDD	0.063U ng/Kg 0.093J ng/Kg 0.400U ng/Kg	A
10258392	MAK103C	2,3,7,8-TCDF Total TCDF	0.072U ng/Kg 0.140J ng/Kg	A
10258392	MAK104C	2,3,7,8-TCDF Total TCDF OCDD	0.11U ng/Kg 0.11J ng/Kg 0.29U ng/Kg	A

SDG	Sample	Compound	Modified Final Concentration	A or P
10258392	MAK105C	2,3,7,8-TCDF Total TCDF OCDD	0.052U ng/Kg 0.062J ng/Kg 0.220U ng/Kg	A
10258392	MAK106C	2,3,7,8-TCDF Total TCDF OCDD	0.070U ng/Kg 0.140J ng/Kg 0.370U ng/Kg	A
10258392	MAK107C	2,3,7,8-TCDF OCDD	0.054U ng/Kg 0.230U ng/Kg	A
10258392	MAK108C	2,3,7,8-TCDF Total TCDF	0.072U ng/Kg 0.062J ng/Kg	A
10258392	MAK110C	2,3,7,8-TCDF	0.078U ng/Kg	A
10258392	MAK101L	OCDD	0.510U ng/Kg	A
10258392	MAK102L	2,3,7,8-TCDF	0.067U ng/Kg	A
10258392	MAK105L	OCDD	0.360U ng/Kg	A
10258392	MAK106L	OCDD	0.250U ng/Kg	A
10258392	MAK112L	OCDD	0.440U ng/Kg	A
10258392	MAK115L	OCDD	0.400U ng/Kg	A

**Makua Military Reservation
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 10258392**

No Sample Data Qualified in this SDG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13/14 → 1/14/14
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	≤ 20/35
IV.	Continuing calibration/IGV	A	QC limits
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	N	C-S.
VII.	Laboratory control samples	A	LCS/LCSD
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	N	
XI.	Compound quantitation/RL/LOQ/LODs	SW	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: 16 tissue / 8 plant tissue

1	MAK101O T	112	MAK104C T	212	MAK108/109/110/113L PT	31	
2	MAK102O T	122	MAK105C T	222	MAK111L PT	32	
3	MAK103O T	132	MAK106C T	232	MAK112L PT	33	
4	MAK104O T	142	MAK107C T	242	MAK115L PT	34	
5	MAK105O T	152	MAK108C T	25		35	
6	MAK106O T	162	MAK110C T	26		36	
7	MAK107O T	172	MAK101L PT	27		37	
8	MAK108O T	182	MAK102L PT	28		38	BLANK-39430
9	MAK102C T	192	MAK105L PT	29		39	BLANK-39500
10	MAK103C T	202	MAK106L PT	30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes: _____

VALIDATION FINDINGS WORKSHEET

Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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

- N N/A Were all samples associated with a method blank?
- N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
- N N/A Was the method blank contaminated?

Blank extraction date: 02/25/14 Blank analysis date: 02/28/14 Associated samples: 1-8 Qual U/Qual J
 Conc. units: ng/kg

Compound	Blank ID	Sample Identification							
		5x	1	2	3	4	5	6	8
	BLANK-39430								
M	0.24*	1.20	0.037U						
E	0.18*	0.900							
O	0.32	1.60	0.045U						
P	0.26	1.30	0.057U						
Y	0.58	--	0.100J						
F	0.32*	1.60	0.093U	0.100*U	0.068U	0.070U	0.069U	0.092U	0.086*U
Q	0.94*	4.70	0.170*U						
G	1.30	6.50	0.300*U	0.270*U	0.280*U	0.400U	0.310U	0.280U	0.330U

*EMPC

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
 All contaminants within five times the method blank concentration were qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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

- N N/A Were all samples associated with a method blank?
- N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
- N N/A Was the method blank contaminated?

Blank extraction date: 03/04/14 Blank analysis date: 03/07/14 Associated samples: 9-24 Qual U/Qual J
Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
		5x	9	10	11	12	13	14	15	16
	BLANK-39500									
H	0.084	0.420	0.063*U	0.072U	0.11U	0.052*U	0.070U	0.054*U	0.072*U	0.078*U
V	0.230	--	0.093J	0.140J	0.11U J	0.062J	0.140J		0.062J	
W	0.036	--								
G	0.11*	0.550	0.400*U		0.29*U	0.220*U	0.370U	0.230*U		

*EMPC

Compound	Blank ID	Sample Identification							
		5x	17	18	19	20	23	24	
	BLANK-39500								
H	0.084	0.420		0.067*U					
V	0.230	--							
W	0.036	--							
G	0.11*	0.550	0.510U		0.360U	0.250U	0.440*U	0.400U	

*EMPC

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 31 through February 11, 2014
LDC Report Date: June 17, 2014
Matrix: Tissue
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III
Laboratory: Pace Analytical Services, Inc.
Sample Delivery Group (SDG): 10260486

Sample Identification

MAK111C	MAK114CMSD
MAK113C	MAK120CMS
MAK114C	MAK120CMSD
MAK115C	MAK121LMS
MAK116C	MAK121LMSD
MAK117C	MAK123LMS
MAK118C	MAK123LMSD
MAK120C	
MAK120L	
MAK121L	
MAK122L	
MAK123L	
MAK124L	
MAK126L	
MAK127L	
MAK128L	
MAK116L	
MAK117L	
MAK118L	
MAK114CMS	

Introduction

This data review covers 27 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
BLANK-39710	3/18/14	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.066 ng/Kg 0.130 ng/Kg 0.12 ng/Kg 0.29 ng/Kg	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C MAK120L MAK121L MAK122L MAK123L MAK124L MAK126L
BLANK-39803	3/24/14	2,3,7,8-TCDF Total TCDF Total TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.049 ng/Kg 0.210 ng/Kg 0.270 ng/Kg 0.015 ng/Kg 0.017 ng/Kg 0.042 ng/Kg 0.012 ng/Kg 0.024 ng/Kg 0.024 ng/Kg 0.046 ng/Kg 0.059 ng/Kg 0.180 ng/Kg	MAK127L MAK128L MAK116L MAK117L MAK118L

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

Sample	Compound	Reported Concentration	Modified Final Concentration
MAK111C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.067 ng/Kg 0.600 ng/Kg 0.140 ng/Kg 0.400 ng/Kg	0.067U ng/Kg 0.600J ng/Kg 0.140U ng/Kg 0.400U ng/Kg
MAK113C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.091 ng/Kg 0.540 ng/Kg 0.320 ng/Kg 0.950 ng/Kg	0.091U ng/Kg 0.540J ng/Kg 0.320U ng/Kg 0.950U ng/Kg
MAK114C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.056 ng/Kg 0.580 ng/Kg 0.340 ng/Kg 1.300 ng/Kg	0.056U ng/Kg 0.580J ng/Kg 0.340U ng/Kg 1.300U ng/Kg
MAK115C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD	0.054 ng/Kg 0.480 ng/Kg 0.370 ng/Kg	0.054U ng/Kg 0.480J ng/Kg 0.370U ng/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
MAK116C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD	0.079 ng/Kg 0.690/Kg 0.550 ng/Kg	0.079U ng/Kg 0.690J ng/Kg 0.550U ng/Kg
MAK117C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD	0.052 ng/Kg 0.059 ng/Kg 0.510 ng/Kg	0.052U ng/Kg 0.059J ng/Kg 0.510U ng/Kg
MAK118C	2,3,7,8-TCDF Total TCDF	0.066 ng/Kg 0.580 ng/Kg	0.066U ng/Kg 0.580J ng/Kg
MAK120C	2,3,7,8-TCDF Total TCDF	0.085 ng/Kg 0.210 ng/Kg	0.085U ng/Kg 0.210J ng/Kg
MAK120L	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDD	0.094 ng/Kg 0.25 ng/Kg	0.094U ng/Kg 0.25U ng/Kg
MAK121L	1,2,3,4,6,7,8-HpCDD OCDD	0.15 ng/Kg 1.10 ng/Kg	0.15U ng/Kg 1.10U ng/Kg
MAK122L	2,3,7,8-TCDF OCDD	0.084 ng/Kg 0.620 ng/Kg	0.084U ng/Kg 0.620U ng/Kg
MAK123L	1,2,3,4,6,7,8-HpCDD OCDD	0.094 ng/Kg 0.97 ng/Kg	0.094U ng/Kg 0.97U ng/Kg
MAK126L	1,2,3,4,6,7,8-HpCDD	0.58 ng/Kg	0.58U ng/Kg
MAK127L	2,3,7,8-TCDF 2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.070 ng/Kg 0.029 ng/Kg 0.110 ng/Kg 0.200 ng/Kg 0.730 ng/Kg	0.070U ng/Kg 0.029U ng/Kg 0.110U ng/Kg 0.200U ng/Kg 0.730U ng/Kg
MAK128L	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.061 ng/Kg 0.081 ng/Kg 0.082 ng/Kg 0.440 ng/Kg	0.061U ng/Kg 0.081U ng/Kg 0.082U ng/Kg 0.440U ng/Kg
MAK116L	2,3,7,8-TCDF Total TCDF 2,3,4,7,8-PeCDF 1,2,3,6,7,8-HxCDF OCDF	0.094 ng/Kg 0.160 ng/Kg 0.017 ng/Kg 0.013 ng/Kg 0.170 ng/Kg	0.094U ng/Kg 0.160J ng/Kg 0.017U ng/Kg 0.013U ng/Kg 0.170U ng/Kg
MAK117L	2,3,7,8-TCDF Total TCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.088 ng/Kg 0.180 ng/Kg 0.018 ng/Kg 0.100 ng/Kg 0.085 ng/Kg 0.680 ng/Kg	0.088U ng/Kg 0.180J ng/Kg 0.018U ng/Kg 0.100U ng/Kg 0.085U ng/Kg 0.680U ng/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
MAK118L	2,3,7,8-TCDF	0.095 ng/Kg	0.095U ng/Kg
	Total TCDF	0.450 ng/Kg	0.450J ng/Kg
	2,3,4,7,8-PeCDF	0.019 ng/Kg	0.019U ng/Kg
	Total PeCDF	0.019 ng/Kg	0.019J ng/Kg
	1,2,3,6,7,8-HxCDF	0.012 ng/Kg	0.012U ng/Kg
	1,2,3,4,6,7,8-HpCDD	0.052 ng/Kg	0.052U ng/Kg
	OCDF	0.073 ng/Kg	0.073U ng/Kg
OCDD	0.380 ng/Kg	0.380U ng/Kg	

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within the QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries (%R) were within QC limits.

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
MAK120L MAK122L	All compounds flagged "P" due to DiPhenylEther interference	J (all detects)	P

The 2,3,7,8-TCDF confirmation was performed with the following exceptions:

Sample	Compound	Finding	Criteria
MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C MAK120L MAK122L MAK127L MAK128L MAK116L MAK117L MAK118L	2,3,7,8-TCDF	2nd column confirmation was not performed for this compound.	2,3,7,8-TCDF must be confirmed on the 2nd column per the method.

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Dioxins/Dibenzofurans - Data Qualification Summary - SDG 10260486**

SDG	Sample	Compound	Flag	A or P	Reason
10260486	MAK120L MAK122L	All compounds flagged "P" due to DiPhenylEther interference	J (all detects)	P	Compound quantitation

**Makua Military Reservation
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG
10260486**

SDG	Sample	Compound	Modified Final Concentration	A or P
10260486	MAK111C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.067U ng/Kg 0.600J ng/Kg 0.140U ng/Kg 0.400U ng/Kg	A
10260486	MAK113C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.091U ng/Kg 0.540J ng/Kg 0.320U ng/Kg 0.950U ng/Kg	A
10260486	MAK114C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD OCDD	0.056U ng/Kg 0.580J ng/Kg 0.340U ng/Kg 1.300U ng/Kg	A
10260486	MAK115C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD	0.054U ng/Kg 0.480J ng/Kg 0.370U ng/Kg	A
10260486	MAK116C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD	0.079U ng/Kg 0.690J ng/Kg 0.550U ng/Kg	A
10260486	MAK117C	2,3,7,8-TCDF Total TCDF 1,2,3,4,6,7,8-HpCDD	0.052U ng/Kg 0.059J ng/Kg 0.510U ng/Kg	A
10260486	MAK118C	2,3,7,8-TCDF Total TCDF	0.066U ng/Kg 0.580J ng/Kg	A
10260486	MAK120C	2,3,7,8-TCDF Total TCDF	0.085U ng/Kg 0.210J ng/Kg	A
10260486	MAK120L	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDD	0.094U ng/Kg 0.25U ng/Kg	A

SDG	Sample	Compound	Modified Final Concentration	A or P
10260486	MAK121L	1,2,3,4,6,7,8-HpCDD OCDD	0.15U ng/Kg 1.10U ng/Kg	A
10260486	MAK122L	2,3,7,8-TCDF OCDD	0.084U ng/Kg 0.620U ng/Kg	A
10260486	MAK123L	1,2,3,4,6,7,8-HpCDD OCDD	0.094U ng/Kg 0.97U ng/Kg	A
10260486	MAK126L	1,2,3,4,6,7,8-HpCDD	0.58U ng/Kg	A
10260486	MAK127L	2,3,7,8-TCDF 2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.070U ng/Kg 0.029U ng/Kg 0.110U ng/Kg 0.200U ng/Kg 0.730U ng/Kg	A
10260486	MAK128L	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.061U ng/Kg 0.081U ng/Kg 0.082U ng/Kg 0.440U ng/Kg	A
10260486	MAK116L	2,3,7,8-TCDF Total TCDF 2,3,4,7,8-PeCDF 1,2,3,6,7,8-HxCDF OCDF	0.094U ng/Kg 0.160J ng/Kg 0.017U ng/Kg 0.013U ng/Kg 0.170U ng/Kg	A
10260486	MAK117L	2,3,7,8-TCDF Total TCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.088U ng/Kg 0.180J ng/Kg 0.018U ng/Kg 0.100U ng/Kg 0.085U ng/Kg 0.680U ng/Kg	A
10260486	MAK118L	2,3,7,8-TCDF Total TCDF 2,3,4,7,8-PeCDF Total PeCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	0.095U ng/Kg 0.450J ng/Kg 0.019U ng/Kg 0.019J ng/Kg 0.012U ng/Kg 0.052U ng/Kg 0.073U ng/Kg 0.380U ng/Kg	A

**Makua Military Reservation
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 10260486**

No Sample Data Qualified in this SDG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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

Validation Area		Comments	
I.	Technical holding times	A	Sampling dates: 1/31/14 → 2/11/14
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	≤ 20/35
IV.	Continuing calibration/ LEV	A	QC limits
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS/LCSD
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	N	
XI.	Compound quantitation/RL/LOQ/LODs	SW	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: 12 tissue / 15 plant tissue

1	MAK111C T	11	MAK122L PT	21	MAK114CMSD T	31	
2	MAK113C T	12	MAK123L PT	22	MAK120CMS T	32	
3	MAK114C T	13	MAK124L PT	23	MAK120CMSD T	33	
4	MAK115C T	14	MAK126L PT	24	MAK121LMS PT	34	
5	MAK116C T	15	MAK127L PT	25	MAK121LMSD PT	35	
6	MAK117C T	16	MAK128L PT	26	MAK123LMS PT	36	
7	MAK118C T	17	MAK116L PT	27	MAK123LMSD PT	37	
8	MAK120C T	18	MAK117L PT	28		38	
9	MAK120L PT	19	MAK118L PT	29		39	BLANK-39710
10	MAK121L PT	20	MAK114CMS T	30		40	BLANK-39803

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes: _____

VALIDATION FINDINGS WORKSHEET

Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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

N N/A

Were all samples associated with a method blank?

N N/A

Was a method blank performed for each matrix and whenever a sample extraction was performed?

N N/A

Was the method blank contaminated?

Blank extraction date: 03/18/14 Blank analysis date: 03/21/14 Associated samples: 1-14 Qual U/Qual J

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
		5x	1	2	3	4	5	6	7	8
	BLANK-39710									
H	0.066	0.330	0.067 U	0.091 U	0.056 U	0.054* U	0.079 U	0.052* U	0.066* U	0.085 U
V	0.130	--	0.600 J	0.540 J	0.580 J	0.480 J	0.690 J	0.059 J	0.580 J	0.210 J
F	0.12*	0.600	0.140 U	0.320 U	0.340 U	0.370* U	0.550 U	0.510 U		
G	0.29*	1.45	0.400 U	0.950 U	1.300 U					

*EMPC

Compound	Blank ID	Sample Identification								
		5x	9	10	11	12	14			
	BLANK-39710									
H	0.066	0.330	0.094* U		0.084* U					
V	0.130	--								
F	0.12*	0.600	0.25 U	0.15 U		0.094* U	0.58 U			
G	0.29*	1.45		1.10 U	0.620* U	0.97 U				

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET

Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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

- N N/A Were all samples associated with a method blank?
- N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
- N N/A Was the method blank contaminated?

Blank extraction date: 03/24/14 Blank analysis date: 03/29/14 Associated samples: 15-19 Qual U
 Conc. units: ng/kg

Compound	Blank ID	Sample Identification							
		5x	15	16	17	18	19		
	BLANK-39803								
H	0.049	0.245	0.070* U	0.061* U	0.094 U	0.088 U	0.095 U		
V	0.210	--			0.160 J	0.180 J	0.450 J		
R	0.270	--							
I	0.015*	0.075							
J	0.017	0.085	0.029* U		0.017* U		0.019 U		
W	0.042	--					0.019 U J		
L	0.012*	0.060			0.013* U	0.018* U	0.012* U		
C	0.024	0.120							
T	0.024	--							
F	0.046*	0.230	0.110 U	0.081 U		0.100 U	0.052* U		
Q	0.059*	0.295	0.200 U	0.082* U	0.170 U	0.085* U	0.073* U		
G	0.180	0.900	0.730 U	0.440 U		0.680 U	0.380 U		

*EMPC

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
 All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Makua Military Reservation
Collection Date: January 13 through January 14, 2014
LDC Report Date: May 2, 2014
Matrix: Tissue
Parameters: Metals
Validation Level: EPA Level III
Laboratory: Brooks Rand Labs

Sample Delivery Group (SDG): 1408020

Sample Identification

MAK101O	MAK108, 109, 110, 113L	MAK115LMSD
MAK102O	MAK111L	MAK115LDUP
MAK103O	MAK112L	
MAK104O	MAK115L	
MAK105O	MAK101OMS	
MAK106O	MAK101OMSD	
MAK107O	MAK101ODUP	
MAK108O	MAK102CMS	
MAK102C	MAK102CMSD	
MAK103C	MAK102CDUP	
MAK104C	MAK103CMS	
MAK105C	MAK103CMSD	
MAK106C	MAK103CDUP	
MAK107C	MAK105CMS	
MAK108C	MAK105CMSD	
MAK110C	MAK105CDUP	
MAK101L	MAK106LMS	
MAK102L	MAK106LMSD	
MAK105L	MAK106LDUP	
MAK106L	MAK115LMS	

Introduction

This data review covers 42 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Metals, EPA Method 1631 Appendix for Mercury, EPA Method 1630 for Methyl Mercury, and EPA Method 1632 Modified for Arsenic Speciation. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

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

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Manganese Zinc	0.01 mg/Kg 0.40 mg/Kg	All samples in SDG 1408020

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MAK102C	Zinc	0.81 mg/Kg	0.81U mg/Kg
MAK103C	Zinc	1.07 mg/Kg	1.07U mg/Kg
MAK104C	Zinc	0.96 mg/Kg	0.96U mg/Kg
MAK105C	Zinc	0.96 mg/Kg	0.96U mg/Kg
MAK106C	Zinc	1.47 mg/Kg	1.47U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
MAK108C	Zinc	0.93 mg/Kg	0.93U mg/Kg
MAK110C	Zinc	0.86 mg/Kg	0.86U mg/Kg
MAK105L	Zinc	1.27 mg/Kg	1.27U mg/Kg
MAK106L	Zinc	1.26 mg/Kg	1.26U mg/Kg

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the methods.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Analyte	Flag	A or P
MAK115LMS/MSD (MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L)	Manganese Aluminum	62 (70-130) 47 (70-130)	- -	- -	Manganese Aluminum	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
MAK103CMS/MSD (MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C)	Methyl Mercury	139 (65-135)	137 (65-135)	-	Methyl Mercury	J (all detects)	A
MAK103CMS/MSD (MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C)	Arsenic (Inorg)	-	45 (65-135)	-	Arsenic (Inorg) Arsenic (V)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Analyte	Flag	A or P
MAK106LMS/MSD (MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L)	Methyl Mercury	-	143 (65-135)	-	Methyl Mercury	J (all detects)	A
MAK101OMS/MSD (MAK101O MAK102O MAK103O MAK104O MAK105O MAK106O MAK107O MAK108O)	Monomethyl Arsenic	52 (60-140)	-	-	Monomethyl Arsenic	J (all detects) UJ (all non-detects)	A

For MAK101OMS/MSD and MAK115LMS/MSD, no data were qualified for Arsenic percent recoveries outside the QC limits since the parent sample results were greater than 4X the spike concentration.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
MAK105CDUP (MAK105C)	Iron Aluminum	46 (≤35) 42 (≤35)	- -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
MAK115LDUP (MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L)	Iron	36 (≤35)	-	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)/Standard Reference Material (SRM)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Arsenic	117 (85-115)	All samples in SDG 1408020	J (all detects)	P

Percent recoveries (%R) of the standard reference material (SRM) were within QC limits with the following exceptions:

SRM ID	Analyte	%R (Limits)	Associated Samples
SRM2 (TORT-3)	Chromium	63 (75-125)	All samples in SDG 1408020
SRM1 (DORM-4)	Lead	54 (75-125)	All samples in SDG 1408020

Although Chromium and Lead were outside control limits of 75-125%, these are new SRMs to BRL and do not have historical data to compare recoveries. The recoveries of the blank spike, other SRMs and all matrix spikes met acceptance criteria and no qualifications were necessary.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Metals - Data Qualification Summary - SDG 1408020**

SDG	Sample	Analyte	Flag	A or P	Reason
1408020	MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L	Manganese Aluminum	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
1408020	MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L	Methyl Mercury	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
1408020	MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C	Arsenic (Inorg) Arsenic (V)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
1408020	MAK101O MAK102O MAK103O MAK104O MAK105O MAK106O MAK107O MAK108O	Monomethyl Arsenic	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
1408020	MAK105C	Iron Aluminum	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)
1408020	MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L	Iron	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)

SDG	Sample	Analyte	Flag	A or P	Reason
1408020	MAK101O MAK102O MAK103O MAK104O MAK105O MAK106O MAK107O MAK108O MAK102C MAK103C MAK104C MAK105C MAK106C MAK107C MAK108C MAK110C MAK101L MAK102L MAK105L MAK106L MAK108, 109, 110, 113L MAK111L MAK112L MAK115L	Arsenic	J (all detects)	P	Laboratory control samples (%R)

**Makua Military Reservation
Metals - Laboratory Blank Data Qualification Summary - SDG 1408020**

SDG	Sample	Analyte	Modified Final Concentration	A or P
1408020	MAK102C	Zinc	0.81U mg/Kg	A
1408020	MAK103C	Zinc	1.07U mg/Kg	A
1408020	MAK104C	Zinc	0.96U mg/Kg	A
1408020	MAK105C	Zinc	0.96U mg/Kg	A
1408020	MAK106C	Zinc	1.47U mg/Kg	A
1408020	MAK108C	Zinc	0.93U mg/Kg	A
1408020	MAK110C	Zinc	0.86U mg/Kg	A
1408020	MAK105L	Zinc	1.27U mg/Kg	A
1408020	MAK106L	Zinc	1.26U mg/Kg	A

**Makua Military Reservation
Metals - Field Blank Data Qualification Summary - SDG 1408020**

No Sample Data Qualified in this SDG

LDC #: 31702H4

VALIDATION COMPLETENESS WORKSHEET

Date: 4/29/14

SDG #: 1408020

Level III

Page: 1 of 2

Laboratory: Brooks Rand Labs

Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 200.8), Mercury (EPA Method 1631 Appendix), Methyl Mercury (EPA Method 1630), Arsenic Speciation (EPA Method 1632M)

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

Validation Area		Findings	Comments
I.	Technical holding times	A	Sampling dates: 1/13/14 - 1/14/14
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	W. + requires
VI.	Matrix Spike Analysis	SW	
VII.	Duplicate Sample Analysis	SW	
VIII.	Laboratory Control Samples (LCS)	SW	LCS, SKM
IX.	Internal Standard (ICP-MS)	N	not reviewed
X.	ICP Serial Dilution	N	not performed
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples: *Tissue*

1	MAK101O	11	MAK104C	21	MAK108, 109, 110, 113L	31	MAK103CMS
2	MAK102O	12	MAK105C	22	MAK111L	32	MAK103CMSD
3	MAK103O	13	MAK106C	23	MAK112L	33	MAK103CDUP
4	MAK104O	14	MAK107C	24	MAK115L	34	MAK105CMS
5	MAK105O	15	MAK108C	25	MAK101OMS	35	MAK105CMSD
6	MAK106O	16	MAK110C	26	MAK101OMSD	36	MAK105CDUP
7	MAK107O	17	MAK101L	27	MAK101ODUP	37	MAK106LMS
8	MAK108O	18	MAK102L	28	MAK102CMS	38	MAK106LMSD
9	MAK102C	19	MAK105L	29	MAK102CMSD	39	MAK106LDUP
10	MAK103C	20	MAK106L	30	MAK102CDUP	40	MAK115LMS

Notes: _____

LDC #: 31702H4

VALIDATION COMPLETENESS WORKSHEET

Date: 4/29/14

SDG #: 1408020

Level III

Page: 2 of 2

Laboratory: Brooks Rand Labs

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 200.8), Mercury (EPA Method 1631 Appendix), Methyl Mercury (EPA Method 1630), Arsenic Speciation (EPA Method 1632M)

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

	Validation Area		Comments
I.	Technical holding times		Sampling dates:
II.	ICP/MS Tune		
III.	Calibration		
IV.	Blanks		
V.	ICP Interference Check Sample (ICS) Analysis		
VI.	Matrix Spike Analysis		
VII.	Duplicate Sample Analysis		See page 1
VIII.	Laboratory Control Samples (LCS)		
IX.	Internal Standard (ICP-MS)		
X.	ICP Serial Dilution		
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data		
XIII.	Field Duplicates		
XIV.	Field Blanks		

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

Validated Samples:

41	MAK115LMSD	51	MB	61	71
42	MAK115LDUP	52		62	72
43		53		63	73
44		54		64	74
45		55		65	75
46		56		66	76
47		57		67	77
48		58		68	78
49		59		69	79
50		60		70	80

Notes: _____

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA 200.8/1631E/1630/1632M) Soil preparation factor applied: 800X, 0.5g to 40ml, 10X
 Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All

					Sample Identification														
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	9	10	11	12	13	15	16	19	20						
Mn	0.01			0.05															
Zn	0.40			2	0.81	1.07	0.96	0.96	1.47	0.93	0.86	1.27	1.26						

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
 Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

- Y N N/A Was a matrix spike analyzed for each matrix in this SDG?
 - Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
 - Y N N/A Were all duplicate sample relative percent differences (RPD) $\leq 20\%$ for samples? ^{25 Lab}
 - Y N N/A Was a post digestion spike analyzed for elements that did not meet the required criteria for matrix spike recovery?
- LEVEL IV ONLY:**
- Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications	Post Spike (%R)
1	40/41		Mn Al	62 (70-130) 47 ↓			17-24 ↓	J/N/A ↓	
2	31/32		Meltg As (Trng)	139 (65-135)	137 (65-135) 45 ↓		19-16 ↓	J/J/A J/N/A	(Qual As(V) + As (Trng))
3	37/38		Meltg		143 (65-135)		17-24	J/J/A	
4	25/26		MMA3	52 52 (60-140) w			1-8	J/N/A	

Comments: # 25, 26, 40, 41, = AS > 4X, No qual for Y.R. Text.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Makua Military Reservation
Collection Date: January 31 through February 11, 2014
LDC Report Date: May 2, 2014
Matrix: Tissue
Parameters: Metals
Validation Level: EPA Level III
Laboratory: Brooks Rand Labs
Sample Delivery Group (SDG): 1411043

Sample Identification

MAK111C	MAK111CMSD
MAK113C	MAK111CDUP
MAK114C	MAK120LMS
MAK115C	MAK120LMSD
MAK116C	MAK120LDUP
MAK117C	MAK122LMS
MAK118C	MAK122LMSD
MAK120C	MAK122LDUP
MAK120L	
MAK121L	
MAK122L	
MAK123L	
MAK124L	
MAK127L	
MAK128L	
MAK116L	
MAK117L	
MAK118L	
MAK126L	
MAK111CMS	

Introduction

This data review covers 28 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA ~~SW-846~~ Method 200.8 for Metals, EPA Method 1631 Appendix for Mercury, EPA Method 1630 for Methyl Mercury, and EPA Method 1632 Modified for Arsenic Speciation. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Selenium, Silver, Thallium, Vanadium, and Zinc.

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The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

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

III. Calibration

The initial and continuing calibrations were performed at the required frequency.

The calibration standards criteria were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
4/11/14	CCV G	Silver	138 (90-110)	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK111CMS MAK111CMSD MAK111CDUP	J (all detects)	P
4/11/14	CCV H	Beryllium	115 (90-110)	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C MAK120L MAK121L MAK122L MAK116L MAK117L MAK111CMS MAK111CMSD MAK111CDUP MAK122LMS MAK122LMSD MAK122LDUP	J (all detects)	P

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Zinc	0.21 mg/Kg	All samples in SDG 1411043

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MAK113C	Zinc	0.94 mg/Kg	0.94U mg/Kg
MAK117C	Zinc	0.83 mg/Kg	0.83U mg/Kg
MAK120C	Zinc	0.57 mg/Kg	0.57U mg/Kg
MAK118L	Zinc	0.90 mg/Kg	0.90U mg/Kg

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was not required by the methods.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Analyte	Flag	A or P
MAK120LMS/MSD (MAK120L MAK121L MAK122L MAK123L MAK124L MAK127L MAK128L MAK116L MAK117L MAK118L MAK126L)	Arsenic (Inorg)	44 (65-135)	-	-	Arsenic (Inorg) Arsenic (V)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Analyte	Flag	A or P
MAK122LMS/MSD (MAK120L MAK121L MAK122L MAK123L MAK124L MAK127L MAK128L MAK116L MAK117L MAK118L MAK126L)	Barium	-	-	52 (≤35)	Barium	J (all detects) UJ (all non-detects)	A

For MAK122LMS/MSD, no data were qualified for Barium percent recoveries outside the QC limits since the parent sample results were greater than 4X the spike concentration.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
MAK111CDUP (MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C)	Aluminum	-	2.09 mg/Kg (≤1.60)	J (all detects) UJ (all non-detects)	A
MAK122LDUP (MAK120L MAK121L MAK122L MAK123L MAK124L MAK127L MAK128L MAK116L MAK117L MAK118L MAK126L)	Manganese Iron	49 (≤35) 41 (≤35)	-	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)/Standard Reference Material (SRM)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

Percent recoveries (%R) of the standard reference material (SRM) were within QC limits with the following exceptions:

SRM ID	Analyte	%R (Limits)	Associated Samples
SRM2 (TORT-3)	Chromium	63 (75-125)	All samples in SDG 1411043
SRM1 (DORM-4)	Lead	52 (75-125)	All samples in SDG 1411043

Although Chromium and Lead were outside control limits of 75-125%, these are new SRMs to BRL and do not have historical data to compare recoveries. The recoveries of the blank spike, other SRMs and all matrix spikes met acceptance criteria and no qualifications were necessary.

IX. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Metals - Data Qualification Summary - SDG 1411043**

SDG	Sample	Analyte	Flag	A or P	Reason
1411043	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C	Silver	J (all detects)	P	Calibration (CCV %R)
1411043	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C MAK120L MAK121L MAK122L MAK116L MAK117L	Beryllium	J (all detects)	P	Calibration (CCV %R)
1411043	MAK120L MAK121L MAK122L MAK123L MAK124L MAK127L MAK128L MAK116L MAK117L MAK118L MAK126L	Arsenic (Inorg) Arsenic (V)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
1411043	MAK120L MAK121L MAK122L MAK123L MAK124L MAK127L MAK128L MAK116L MAK117L MAK118L MAK126L	Barium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (RPD)
1411043	MAK111C MAK113C MAK114C MAK115C MAK116C MAK117C MAK118C MAK120C	Aluminum	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (difference)

SDG	Sample	Analyte	Flag	A or P	Reason
1411043	MAK120L MAK121L MAK122L MAK123L MAK124L MAK127L MAK128L MAK116L MAK117L MAK118L MAK126L	Manganese Iron	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)

**Makua Military Reservation
Metals - Laboratory Blank Data Qualification Summary - SDG 1411043**

SDG	Sample	Analyte	Modified Final Concentration	A or P
1411043	MAK113C	Zinc	0.94U mg/Kg	A
1411043	MAK117C	Zinc	0.83U mg/Kg	A
1411043	MAK120C	Zinc	0.57U mg/Kg	A
1411043	MAK118L	Zinc	0.90U mg/Kg	A

**Makua Military Reservation
Metals - Field Blank Data Qualification Summary - SDG 1411043**

No Sample Data Qualified in this SDG

LDC #: 3170214

VALIDATION COMPLETENESS WORKSHEET

Date: 4/3/14

SDG #: 1411043

Level III

Page: 1 of 1

Laboratory: Brooks Rand Labs

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 200.8), Mercury (EPA Method 1631 Appendix), Methyl Mercury (EPA Method 1630), Arsenic Speciation (EPA Method 1632M)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/31/14 - 2/11/14
II.	ICP/MS Tune	A	
III.	Calibration	SW	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	N	Not required
VI.	Matrix Spike Analysis	SW	
VII.	Duplicate Sample Analysis	SW	
VIII.	Laboratory Control Samples (LCS)	SW	LCS, SRM
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	ICP Serial Dilution	N	Not performed
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Tissue

1	MAK111C	11	MAK122L	21	MAK111CMSD	31	MPB
2	MAK113C	12	MAK123L	22	MAK111CDUP	32	
3	MAK114C	13	MAK124L	23	MAK120LMS	33	
4	MAK115C	14	MAK127L	24	MAK120LMSD	34	
5	MAK116C	15	MAK128L	25	MAK120LDUP	35	
6	MAK117C	16	MAK116L	26	MAK122LMS	36	
7	MAK118C	17	MAK117L	27	MAK122LMSD	37	
8	MAK120C	18	MAK118L	28	MAK122LDUP	38	
9	MAK120L	19	MAK126L	29		39	
10	MAK121L	20	MAK111CMS	30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA 200.8/1631E/1630/1632M) Soil preparation factor applied: 800X, 0.5g to 40ml, 10X
 Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All

					Sample Identification													
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	2	6	8	18										
Zn	0.21			1.05	0.94	0.83	0.57	0.90										

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
 Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Makua Military Reservation
Collection Date: January 31 through February 11, 2014
LDC Report Date: April 30, 2014
Matrix: Tissue
Parameters: Perchlorate
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 320-6575-1

Sample Identification

MAK111C
MAK113C
MAK114C
MAK115C
MAK116C
MAK117C
MAK118C
MAK120C
MAK113CMS
MAK113CMSD

Introduction

This data review covers 10 tissue samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6850 for Perchlorate.

This review follows the Final Supplemental Marine Resources Study Sampling and Analysis Plan at Makua Military Reservation, Oahu, Hawaii (August 2013), the Final Draft Version of the U.S. Department of Defense (DoD) and Department of Energy (DoE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (March 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

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

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. LC/MS Instrument Performance Check

Instrument performance check is not required by the method.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 15.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

The percent differences (%D) of the limit of detection verification (LODV) standard were less than or equal to 30.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were not required by the method.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. System Performance

Raw data were not reviewed for this SDG.

XIV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XV. Field Duplicates

No field duplicates were identified in this SDG.

**Makua Military Reservation
Perchlorate - Data Qualification Summary - SDG 320-6575-1**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 320-6575-1**

No Sample Data Qualified in this SDG

**Makua Military Reservation
Perchlorate - Field Blank Data Qualification Summary - SDG 320-6575-1**

No Sample Data Qualified in this SDG

LDC #: 31702J87

VALIDATION COMPLETENESS WORKSHEET

Date: 4/29/14

SDG #: 320-6575-1

Level III

Page: 1 of 1

Laboratory: Test America, Inc.

Reviewer: JVG

2nd Reviewer: [Signature]

METHOD: LC/MS Perchlorate (EPA SW846 Method 6850)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/31/14 - 2/11/14
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD \leq 15%
IV.	Continuing calibration/ICV	A	CV/ICV \leq 15% LODV \leq 30%
V.	Blanks	A	
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	A	
XV.	Field duplicates	N	
XVI.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Tissue Water

1	MAK111C	11	MB 320-39835/A	21		31	
2	MAK113C	12		22		32	
3	MAK114C	13		23		33	
4	MAK115C	14		24		34	
5	MAK116C	15		25		35	
6	MAK117C	16		26		36	
7	MAK118C	17		27		37	
8	MAK120C	18		28		38	
9	MAK113CMS	19		29		39	
10	MAK113CMSD	20		30		40	

(sea cucumber)